COORDINATION AND LINEAR ORDER

by

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A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Linguistics and Cognitive Science

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ABSTRACT

This thesis investigates the syntax of coordination, focusing on three topics: structure, agreement, and extraction. I show that asymmetries between conjuncts in selection, agreement, binding, weak crossover, and reconstruction are all due to linear order. I propose 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 I call Set Label. Set Label makes the label of the entire phrase the union of the labels of the conjuncts. Set Label captures agreement resolution in coordination and, combined with left-to-right structure building, it also captures cases of agreement with a single conjunct and mismatches in syntactic category. Recent analyses of closest conjunct agreement have proposed that the linear effects observed in that phenomenon are due to agreement being resolved not in the syntax but at phonological spellout. Similar linear effects with selection, binding, crossover, and reconstruction cannot be captured in this way and require a syntactic analysis. The uniform analysis that I propose for all of these effects also captures closest conjunct agreement in the syntax. Finally, the dissertation also contributes to the question of what restricts extraction from a coordinate structure. I adopt and defend previous analyses according to which the Coordinate Structure Constraint should be reduced to two constraints: (i) a constraint on pronunciation which bans leaving a conjunct unpronounced; and (ii) a semantic parallelism constraint. My investigation of linear asymmetries in across-the-board movement removes arguments for treating multiple gaps in a disparate manner, and I accordingly suggest a uniform analysis for multiple gaps in across-the-board movement. This dissertation contributes significantly to the debate on the status of linear order in syntax, arguing for a primary role for

linear order in the syntax. It also highlights the idea that coordination is special, and requires a special mode of structure building.

Chapter 1

INTRODUCTION

This dissertation explores various issues in the syntax of coordination. It has three main goals. The first goal is to show that agreement, binding and selection facts do not argue for a particular configuration between conjuncts. Linear order, not hierarchy, plays a crucial role in these phenomena, and so they do not implicate any particular hierarchical structure for coordination. I propose that coordinate complexes are different from simple phrases in the way they are labeled. In particular, I argue that a coordinate complex's label should be a set of the categories of its conjuncts. The set label is computed via a union algorithm trigged by the merge of the coordinator. Set labeling captures the facts of agreement feature resolution, and reflect a feature set union algorithm that has been proposed by Dalrymple and Kaplan (2000).

The second goal is a continuation of a recent line of thinking which argues that agreement in the context of coordination interacts with linear order. It turns out, as I will argue, that not only is conjunct agreement affected by linear order, but also selection and binding. This assumption defies a long-standing analysis that c-command is what facilitates agreement, binding and selection in the context of coordination. Since these phenomena are linear, they do not impose limits on how we must analyze the structure.

The third and last goal is relevant to the Coordinate Structure Constraint (CSC). The CSC is subdivided into the Conjunct Constraint (CC) which bans extracting conjuncts and the Element Constraint (EC) which bans extracting an element within a conjunct. Since Ross (1967), the CSC has been the focus of much debate. Because the CSC is a construction specific constraint, and because the EC can be violated in many contexts, such as in (1), various attempts have been made to reduce

it to a more general constraint(s). My goal is a continuation of these attempts. I adopt the analysis that the CC is best analyzed as a constraint on leaving conjuncts unpronounced (Grosu 1981, Munn 1993, Merchant 2001), and I propose that the EC should be eliminated from the grammar.

(1) a. Who$_{\text{i}}$ does [[Big Louie visit t_{i}] and [the whole gang goes nuts]]? (Culicover and Jackendoff 1997, 210, (40a))

b. Setting aside illegal poaching for a moment, [how many sharks]$_{\text{i}}$ do you estimate [[t_{i} died naturally] and [t_{i} were killed recreationally]]? (Chaves 2014, 835, (4c))

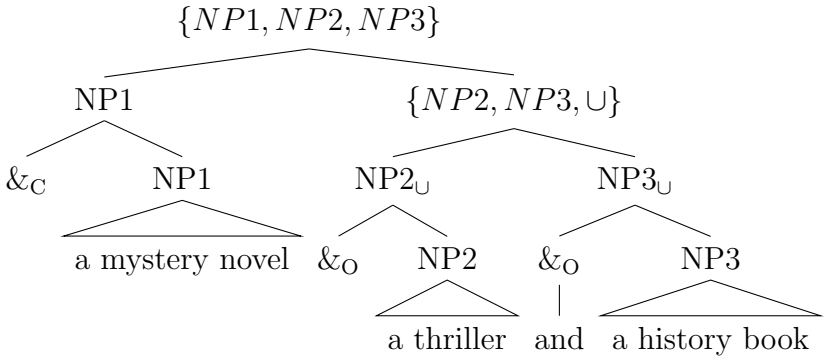
I will propose that element extraction in symmetrical coordination is forced to be ATB because of a semantic parallelism constraint, but extraction from asymmetric coordination is free.

1.1 Structure

Chapter 2 addresses issues in coordinate structure. I will investigate issues of hierarchy, constituency, headedness, restriction on combination and selection. One of the main goals of the chapter is to show that binding and selection phenomena are affected by linear order. Thus, these phenomena should not argue for any specific configuration between conjuncts. In fact, it turns out that almost all structures that have been proposed could be compatible with the facts.

I propose 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 I call Set Label, as illustrated below:

(2)



Dalrymple and Kaplan (2000) argue that the phi features of the coordinate label is a result of a union operation of the phi features of the conjunct. I adopt this analysis and extend it to the category label. The coordinate structure I argue for is one in which the label of the coordinate complex is a set of the labels of its conjuncts. The structure which I assume is built from left to right and has all conjuncts selected by a coordinator, even the coordinate initial one. I assume that the role of the coordinate initial coordinator is to trigger a set labeling algorithm that creates set labels. The motivation behind set labeling is agreement resolution.

1.1.1 Binding

It was observed that there are asymmetries between conjuncts in binding within the coordinate structure (Dik 1968; Collins 1988; Moltmann 1992; Munn 1993; among others). Binding into the second from the first conjunct is possible, but binding into the first conjunct from the second is not. For instance, the ungrammaticality of (3) which is due to condition C violation, was argued to show that the first conjunct is hierarchically higher than and c-commands the rest of the conjuncts.

(3) (Munn 1993, 16, (2.8))

a. John$_i$'s dog and him$_i$ went for a walk.

b. He$_i$/Him$_i$ and John$_i$'s dog went for a walk.

A similar argument was made to account for quantifier binding (Dik 1968; Moltmann 1992; Munn 1993). A quantifier in the first conjunct may bind a variable in the second conjunct. If variable binding requires c-command, then the first conjunct must c-command subsequent ones.

(4) (Munn 1993, 16, (2.7))

a. Every$_i$ man and his$_i$ dog went to mow a meadow.

b. His$_i$ dog and every man went to mow a meadow.

However, a c-command analysis of condition C and variable binding does not seem to be the right analysis. Condition C can be violated even when the antecedent does not c-command the R-expression it binds. In (5b), condition C is violated even though *him* does not c-command *Peter* (Langacker 1969; Bruening 2014).

(5) (Langacker 1969, 162, (1–2))

a. Penelope [cursed Peter$_i$ and slandered him$_i$]

b. * Penelope [cursed him$_i$ and slandered Peter$_i$]

In fact, recent arguments show that c-command is not the right relation for binding conditions (Bruening 2014), quantifier binding, (Barker 2012) and for NPI licensing (Hoeksema 2000). For binding condition C, Bruening (2014) argues that the right analysis is precede-and-command where command is phase command. X phase commands Y if there is no phasal node A such that A dominates X but does not dominate Y. For quantifier binding, Barker (2012) shows that binding is explained via semantic scope rather than syntactic c-command. NPI licensing, on the other hand, has been shown to be satisfied by being in the scope of a non-veridical operator (Giannakidou 1998 and subsequent work). Therefore, none of binding conditions, quantificational binding and NPI licensing argues for a particular hierarchical configuration between conjuncts. I will show that the asymmetries we see are due to linear order.

1.1.2 Selection

Gazdar et al. (1985) and Johannessen (1996; 1998), among others note that when a verb selects a coordinate phrase as an argument, it appears that the first conjunct must meet the selectional restrictions of the selecting head as in (6a) in which *on* requires a nominal argument, and in which the object is a conjunction of an NP and a CP. Note that reversing the order of NP and CP makes the sentence ungrammatical (6b).

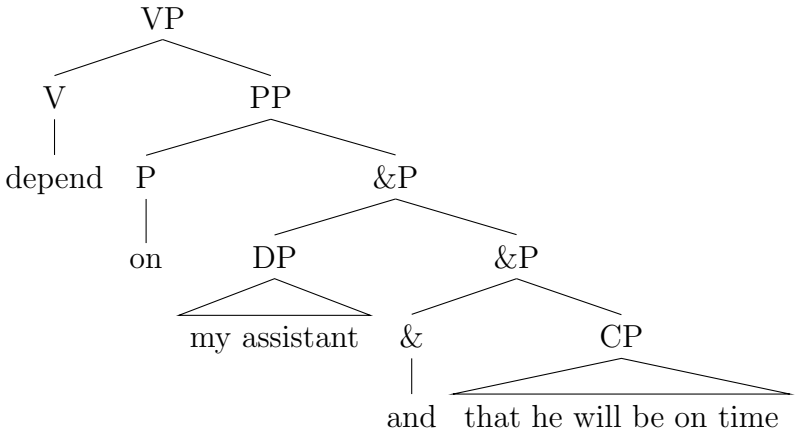
(6) (Gazdar et al. 1985)

a. You can depend on [$_{DP}$ my assistant] and [$_{CP}$ that he will be on time].

b. * You can depend on [$_{CP}$ that my assistant will be on time] and [$_{DP}$ his intelligence].

That the first conjunct must satisfy the selectional restrictions of the selecting head in cases such as (6) was explained by the hierarchy between conjuncts and by assuming that the coordinate phrase is an adjunction of the non-initial conjuncts to the first conjunct (Munn 1992, 1993; Bošković and Franks 2000; Hartmann 2000). Thus, the coordinate phrase inherits the features of the first conjunct. Alternatively, Johannessen (1998) and Zhang (2010a) propose that first conjunct is a specifier, as in the structure in (6), and this specifier is able to transfer its categorial features to the coordinator. From there, these features percolate up to the coordinate phrase.

(7)



However, hierarchy based analyses do not capture all facts of selection. More data show that the final conjunct may also control selection when the head with which the selection features are to be checked follows the coordinate complex. For instance, in (8a), in which the AP *once and future* modifies *king*, only *future* is compatible with *king*, *once* is not. Therefore, selection does not seem to be affected by hierarchical relations. Rather, it appears that it significantly interacts with linear order.

(8) a. the [once and future] king

b. the future king

c. * the once king

1.2 Linear Effects in Conjunct Agreement

In chapter 3, I will discuss the issue of agreement in the context of coordination. Section 3.1 discusses agreement feature resolution and shows how resolution works in the structural analysis I propose. The rest of the chapter will be dedicated to closest conjunct agreement (CCA), where a peripheral conjunct controls agreement on an outside head.

CAA has long been an issue of interest in the literature of coordination. It has been noted that the first conjunct controls agreement on an external agreement target in many languages such as Arabic (Aoun et al. 1994; Munn 1999a) and Hebrew (Doron 2000). For instance, in (9), *al-muʕallim-ah*, a singular feminine noun, controls agreement on the verb *ʔallaf-at* 'read'. The verb may not agree with the distant conjunct, *at-tilmiið*, a masculine noun.

(9) ʔallaf- {∗Ø/*at*/ ∗ *u*} [al-muʕallim-ah wa
write- {∗3*M.SG*/3*F.SG*/ ∗ 3*M.PL*} [the-teacher-F.SG and
at-tilmiið] riwayah
the-student-M.SG] a.novel
'The teacher and the student wrote a novel.'

Conjunct agreement was initially explained as occurring via spec-head agreement (Aoun et al. 1994) or via agreement under exceptional government (Munn 1999a).

Recent minimalist analyses proposed that conjunct agreement occurs via AGREE between the verb and the first conjunct before the merge of the rest of the conjunction (Larson 2013; Soltan 2007). All these analyses share the assumption that the first conjunct controls agreement because it is syntactically higher than the rest of the conjuncts.

However, data introduced more recently, from Balkan languages such as Slovenian and Croatian, from Germanic languages such as Dutch (van Koppen 2008) and Bavarian (van Koppen 2012; Fuβ 2014), and from Hindi-Urdu, an Indo-Aryan language (Benmamoun et al. 2009; Bhatt and Walkow 2013) show once again that linear order plays an important role. In these languages, the last conjunct as well as the first conjunct may control agreement. However, the choice of the conjunct that controls agreement is not random. The conjunct which is linearly closest to the agreement target is the one that controls agreement. In (10a), from Croatian, when the verb precedes the coordinate complex, the initial conjunct, *sva sela* 'all villages' controls agreement on *uništena* 'destroyed', while the last conjunct *sve varošice* 'all towns' controls agreement when the verb *uništene* follows the coordinate complex (10b).

(10) Croatian (Bošković 2009, 456 (1a-b))

a. Juče su uništena [sva sela i sve varošice]
yesterday are destroyed.PL.N [all villages.N and all towns.F]
'All villages and all towns were destroyed yesterday.

b. [sva sela i sve varošice] su juče uništene
[all villages.N and all towns.F] are yesterday destroyed.PL.F
'All villages and all towns were destroyed yesterday.'

To account for linear effects of agreement, Marušič et al. (2007), Benmamoun et al. (2009) and Bhatt and Walkow (2013) introduced compositional agreement. According to the compositional agreement analysis, CA is split between syntax and PF. When the probe fails to value its features in the syntax, valuation of agreement is delayed to PF, where agreement is valued on the basis of linear closeness between the conjunct and the agreeing head.

While compositional agreement captures linear effects, postponing agreement until PF on the basis of the assumption that linear precedence is specified at PF does not appear quite right. We see the same linear effects in selection, but it does not make sense to delay checking of selection until PF. In chapter 4, we will also see that asymmetries in weak crossover and reconstruction are based on linear order, but these effects too must be syntactic. I will take this assumption as a starting point to propose an analysis that captures CCA in the syntax. Following Bhatt and Walkow (2013) and Bhatt (2005), I assume that case assignment of a coordinate results in deactivation of resolved phi features. I follow Walkow (2013) in assuming that heads that check case need to agree with the whole coordinate, so that case spreads to all conjuncts. I hypothesize that heads that do not check case only need *some* phi features, so they agree with whatever closest to them. In the Left-to-Right derivational model I adopt, first conjunct agreement occurs as soon as the first conjunct is merged. Last conjunct agreement occurs after the whole coordinate is built, but at that point resolved features have been deactivated, so resolved agreement is ruled out.

1.3 Issues in Extraction

Chapter 4 addresses the Coordinate Structure Constraint (CSC). The CSC, stated below, was proposed by (Ross 1967) as governing extraction from a coordinate complex.

(11) "In a coordination structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct." (Ross 1967, 89)

Grosu (1973) divides the CSC into two parts: (i) the coordinate constraint (CC) which bans extraction of conjuncts (12), and (ii) the element constraint (EC) which bans extracting an element out of a conjunct (13).

(12) CC (Zhang 2010a, (4.1a),(4.2a))

a. * John$_i$ seems to be [_ $_i$ and Mary] in the room.

b. * Mary$_i$ seems to be [John and _$_i$] in the room.

(13) EC (Chaves 2012b, (9))

a. * What$_i$ did Kim [cook t_i and wash the dishes]?

b. * What$_i$ did Kim [cook supper and wash t_i]?

Many researchers point out that the CC seems to be inviolable (Johannessen 1998; Postal 1998). However, there are a few languages that are claimed to allow extraction of the first conjunct. One example is Chinese. Zhang (2010a) claims that the CC is violated in (14), where apparently the first conjunct, *huoche* has moved to spec-TP.

(14) Huoche$_i$ hui [_$_i$ gen qiche] xiangzhuang ma?
train might [and bus] collide Q
'Might the train collide with the bus?' (Zhang 2010a, 114, (4.81a); adapted)

Following Grosu (1981), Munn (1993), Merchant (2001), and Zhang (2010a), I will assume that the CC is not a constraint on movement, it is a constraint on pronunciation. To defend this position, I will argue against the claim that the initial conjunct can violate the CC in some contexts. I will show that the contexts in which the CC is apparently violated are in fact comitatives which allow these extractions freely.

The element constraint has also been found to be violable in many contexts (Williams 1977; Goodall 1987; Postal 1998; Levine 2001; Levine and Hukari 2006; Zhang 2010a; Chaves 2012b). First, the EC can be violated if an element is extracted from every conjunct simultaneously, in what is known as Across the Board (ATB) movement:

(15) What$_i$ did Kim [cook t_i for two hours and eat t_i in four minutes]? (Chaves 2012b, (19))

The EC can also be violated in asymmetrical coordination, an instance of coordination in which conjuncts are linked to each other by some logical relation like a causative, conditional or temporal relation. In this case, extraction from one conjunct is possible. In symmetrical coordination, where all conjuncts are on a par, an element can be extracted only if extraction is ATB.

(16) a. [How much]$_{\text{i}}$ can you [drink t_{i} and still stay sober]? (Lakoff 1986, 152)

b. Who$_{\text{i}}$ did Lizzie Borden [take an ax and whack t_{i} to death]? (Schmerling 1972)

To explain these violations, I propose that the grammar does not need a special syntactic constraint for element extraction from a coordinate phrase. Extraction from coordinates and non-coordinates should be equally licit (Chaves 2012b). However, I propose that the restriction on extraction from symmetric coordination by ATB movement is due to a semantic parallelism constraint, which only applies in symmetric coordination (Safir 1984; Munn 1993; Fox 2000). In symmetric coordination only similar semantic types may be combines. Asymmetric extraction from symmetric coordination clearly violates this constraint, and causes the derivation to crash.

As for the syntactic mechanism behind ATB movement, I show that many of the asymmetries between ATB gaps follow from linear order. These asymmetries do not show that ATB gaps are of different nature, contra previous proposals to that effect (Munn 1993; Bošković and Franks 2000; Zhang 2010a; Salzmann 2012). Both ATB gaps and parasitic gaps show the same linear asymmetries. However, ATB gaps and parasitic gaps differ in what category they can be (Postal 1993). I therefore propose that they differ in their derivation, and propose a forking chains analysis of ATB movement. The analysis is couched in terms of the Left-to-Right structure building argued for throughout the dissertation.

1.4 General Results

This thesis contributes significantly to the debate on the status of linear order in syntax, arguing for a primary role for linear order in the syntax. In this thesis, I show that asymmetries between conjuncts in selection, agreement, binding, weak crossover, and reconstruction are all due to linear order. Recent analyses of closest conjunct agreement have proposed that the linear effects observed in that phenomenon are due to agreement being resolved not in the syntax but at phonological spellout. Similar linear effects with selection, binding, crossover, and reconstruction cannot be captured in this way and require a syntactic analysis. The uniform analysis that I propose for all of these effects also captures closest conjunct agreement in the syntax.

The thesis also highlights the idea that coordination is special, and requires a special mode of structure building. I propose 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 I call Set Label. Set Label makes the label of the entire phrase the union of the labels of the conjuncts. Set Label captures agreement resolution in coordination and, combined with left-to-right structure building, it also captures cases of agreement with a single conjunct and mismatches in syntactic category.

Finally, the thesis also contributes to the question of what restricts extraction from a coordinate structure. I adopt and defend previous analyses according to which the Coordinate Structure Constraint should be reduced to two constraints: (i) a constraint on pronunciation which bans leaving a conjunct unpronounced; and (ii) a semantic parallelism constraint. My investigation of linear asymmetries in across-the-board movement removes arguments for treating multiple gaps in a disparate manner, and I accordingly suggest a uniform analysis for multiple gaps in across-the-board movement.

Chapter 2

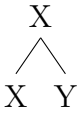
ISSUES IN COORDINATE STRUCTURE

In this chapter, I discuss various issues in the structure of coordination. I propose that a coordinate complex is special in that it requires a special sort of labeling, which I call Set Labeling. I motivate Set Labeling from facts about agreement resolution. In sections 2.2 through 2.4, I address various issues that pertain to the structure of coordination. They include branching, headedness, constituency, and hierarchy. In section 2.5, I show that unlike asymmetric coordination, symmetric coordination imposes semantic and morphophonological parallelism constraint on the conjuncts. Section 2.6 discusses selection in the context of coordination. I show that selection is a linear phenomenon, and propose an account for it. In section 2.7, I discuss the differences between symmetric and asymmetric coordination.

2.1 Derivation of Coordinate Structures

It is well established in the minimalist tradition that the fundamental structure building operation is Merge (Chomsky 1995, 2001). Merge takes two items and combines them to build a larger constituent. (Chomsky 1995) argues that the newly formed constituent can take the label of the selector via the operation Label. The item created by merge inherits the categorial features of X, being the head. So, if the selector is N then the label is N, and so forth.

(17)



I propose that the derivation of coordinate complexes is different from the derivation of non-coordinate phrases. First, a coordinate is semantically exocentric. By exocentric, I mean the meaning of the coordinate complex is not mainly derived from

a single conjunct. All conjuncts are crucial in meaning. The other property of a coordinate which distinguishes it from a non-coordinate phrase is agreement feature resolution. In a nominal coordinate, agreement features of the coordinate complex are derived from the features of individual conjuncts. In some examples, the features of the whole coordinate complex are not the features of any of the conjuncts. For instance, in Modern Standard Arabic a combination of a masculine singular and a feminine singular is resolved as masculine dual (18).

(18) [Ali wa Salma] taʕawan-aa fi ħall al-masʔalah
[Ali.3M.SG and Salma.3F.SG] cooperate-3M.DU in solution problem
'Ali and Salma cooperate in solving the problem.'

In (19), the word *al-ħukumah* 'government' is feminine singular while the word *šaʕb* 'people' is masculine plural. The agreement morpheme that appears on the verb *yataʔawan-u* 'cooperate' is masculine plural, which is a result of the resolution of the mismatched genders here.

(19) Modern Standard Arabic

[al-ħhukumah waš- šaʕb] yažib an yataʔawan-u min ʔžl
[the-government and people] should inf cooperate-3M.PL for sake
al-ħifað ʕala al-ʔamin
the-keeping on the-security

'The government and people should cooperate in maintaining the security (of the country).'

This is not the case in non-coordinate NPs in which the only NP that controls agreement is the head no matter how many nouns occur in the constituents adjoined to that NP. In (20), *is* agrees in number with *reason*, the head to which *why many students avoid studying material sciences in the Middle East* is adjoined.

(20) The reason why many students avoid studying material sciences in the Middle East is the lack of job opportunities.

Therefore, I propose that structure building of coordinates should be special. To account for agreement resolution, Dalrymple and Kaplan (2000) argue that agreement resolution is computed via union of feature sets of conjuncts. They show that person and gender features of conjuncts undergo union as sets. The union of these sets is assigned a value according to a system that has been shown to be valid for many languages. For example, the combination of singular and singular is a set of values. The number value of this set is dual. Using numerical values, a set consisting of the union of one and one is two, which is translated into a DUAL number. (See section 3.2.)

(21) $\{SG\} \cup \{SG\} = \{SG, SG\}$= [DUAL]

I will extend set union analysis to structure building and category labeling, and propose that the way a coordinate complex is labeled reflects the facts about agreement feature resolution. My analysis is inspired by *set merge*, which has been proposed as a general merge operation in Collins (2002), Collins (2014), and Collins and Stabler (2011). However, I will call my analysis Set Labeling because I propose that it is the labeling that is different in coordination not the merge operation itself. Conjuncts combine via regular merge, but the coordinate complex's label is a set label.

Before I spell out the Set Label condition, I need to make an important assumption. I assume that there are two sorts of coordinators: an open coordinator and a closed coordinator. An open coordinator endows the conjunct it combines with with a union feature [$\cup$]. A closed coordinator does not endow its complement with any features. Closed coordinators occur coordinate initially to initiate the set label operation, assuming that sentences are built from left to right (Philips 1996). I will also show that closed coordinators may occur coordinate initially, but only to introduce coordinate subgroups. Based on the two types of coordinators, the merger of the coordinators is shown in (22). $\&_{O}$ stands for an open coordinator, and $\&_{C}$ stands for a closed coordinator.

(22) a. Merge of ($\&_O$,α)=$\alpha_\cup$

b. Merge of ($\&_C$,α) =α

I assume that the difference between open and closed coordinators is featural, so in a given language they are not predicted to be realized as two different lexical items. However, whether open coordinators should be overt is language specific. In a language like English, closed coordinators are always null, but in a language like French, closed coordinators may be pronounced.[1]

The standard analysis of MERGE is that it takes two syntactic objects (α, β) and forms K(α, β). What is special about coordination is that the label is a set, thus I shall propose the following algorithm:

---

[1] I should note that French does not require coordinate initial coordinators in all contexts, as pointed out to me by Alan Munn, citing Mouret (2004). Mouret shows examples in which the use of coordinate initial coordinators enforces distributive reading, as in (1b). Note that the coordinate initial coordinator is ungrammatical with a collective predicate, as in (2b).

(1) (Mouret 2004, (9))

a. Max et Léa font ses devoirs.
Max and Léa do their homework
'Max and Léa did their homework.' (collective/distributive)

b. et Max et Léa font ses devoirs.
and Max and Léa do their homework
'Max and Léa are both doing their homework.' (distributive)

(2) a. Max and Léa forment un couple heureux.
Max and Léa make a couple happy.
'Max and Léa make a happy couple.'

b. *et Max et Léa forment a couple heureux.
and Max and Léa make a couple happy.

One way to explain this is to assume that a closed coordinator in French has two phonological realizations: an overt one which enforces distributivity and a null one which does not allow distributivity. Another possible explanation for why the distributive reading does not arise with the null coordinator is pragmatic. The null closed coordinator is general, while the overt one is specific to distributive environments. Not using the overt one leads to the implicature that the distributive reading was not intended.

(23) The Set Label Condition

a. If one of $\alpha,\ \beta$ has $\cup$ then label of K($\alpha,\ \beta$) is $\{\alpha,\ \beta\}$

b. If both $\alpha,\ \beta$ have $\cup$, then label of K($\alpha,\ \beta$) is $\{\alpha, \beta, \cup\}$

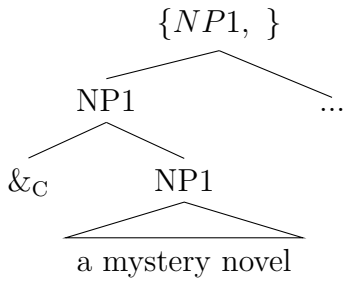
c. If neither α *nor* β have $\cup$, then label of K($\alpha,\ \beta$) is either α *or* β.

According to the definition in (22), the projection that results from merging a syntactic constituent with an open coordinator $\&_O$ is one with a union feature [$\cup$]. The union feature indicates that the conjunct is yet to be merged with another constituent. If that constituent has a union feature as well, then the resulting merger of these constituents, which both have a union feature, is a projection with one union feature. I assume that one union feature must be canceled out upon merge. Now consider the sentence below.

(24) Tiffany bought [a mystery novel, a thriller, and a history book] from the bazaar.

I assume that structure is built from left to right. Thus, the merger of the coordinate initial coordinator triggers Set Label. When the coordinator is merged with *a mystery novel*, the merger is labeled as NP1, a set node is projected, as a coordinate complex's node. NP1 is added to the set node as the first member.

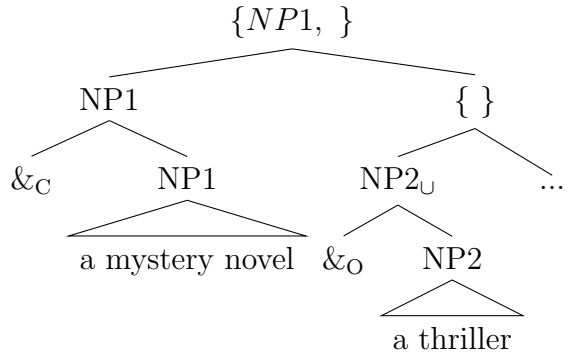
(25)



Merging conjuncts continues from left to right. *a thriller* merges with an open coordinator to form $NP2_{\cup}$. Again, an empty set label is projected. It cannot be filled until a union feature is checked. In my analysis, a combination of a closed coordinator

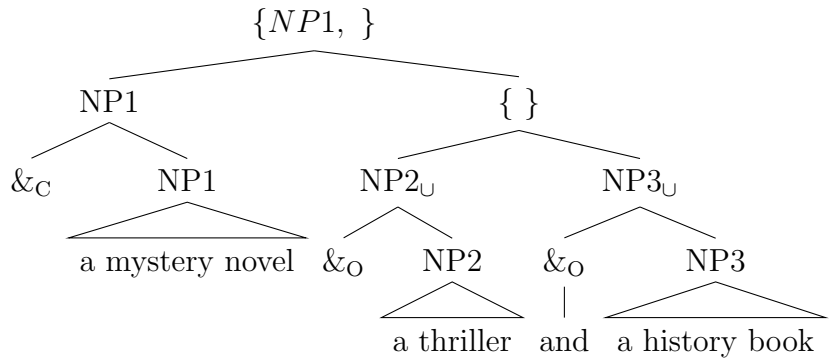
plus NP1 will always need to combine with an open coordinator. This is triggered by the need of the coordinate complex's topmost node to be filled. I will show later that there is an exception to this generalization, namely when the first conjunct is dropped.

(26)



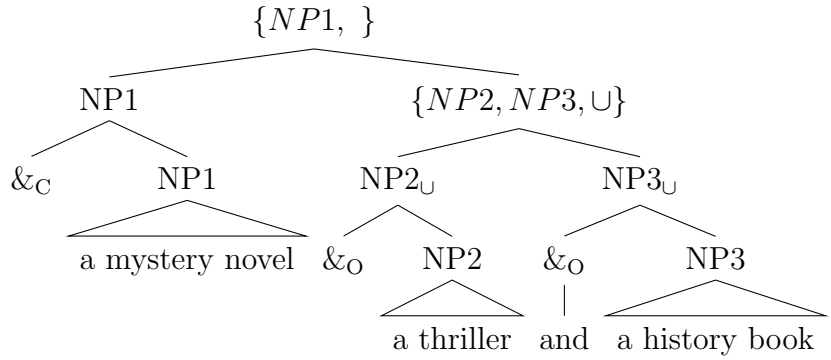
The union feature on NP2 means that there is a conjunct to be merged. *A history book* merges with an open coordinator to form $NP3_{\cup}$.

(27)



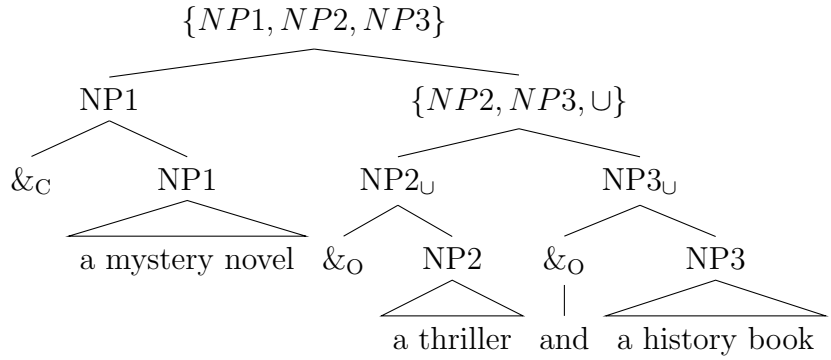
For NP2 and NP3 to fill in the set label that immediately dominates them, one of their union features must be checked. One union feature remains. This gives the combination the label $\{NP2, NP3, \cup\}$.

(28)



The remaining union feature is now checked when NP2 and NP3 merge with NP1 in the coordinate's topmost set label. So the label becomes $\{NP1, NP2, NP3\}$.

(29)



Note that in English, one can optionally pronounce any open coordinator, but not any closed one. The general preference is to only pronounce the final one.

An important issue that needs to be addressed is selection. There should be some mechanism to integrate the coordinate complex, which has a set label, into the surrounding syntax. I hypothesize that there is a category resolution of the set. In section 2.6, I propose that category resolution is evaluated on the basis of the selector. In particular, the label of the coordinate is determined by the selectional requirements of the selecting head as well as its precedence relation with the coordinate complex.

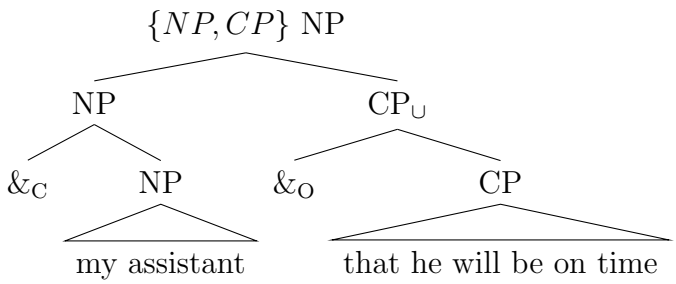
Selection has been found to be sensitive to linear closeness, so the conjunct closest to the selector is the one that counts for selection. Compare (30a) to the ungrammatical (30b) in which CP is closest to *on*. Therefore, the resolution of the categories in (30a) is NP.

(30) a. You can depend on [$_{\text{NP}}$ my assistant] and [$_{\text{CP}}$ that he will be on time]. Gazdar et al. (1985)

b. *You can depend on that my assistant will be on time and his talents.

So the resolution of (30a) would look as in (31). I place the resolved category outside the coordinate set. Note that in (29), the only possibility for category resolution is NP, since all coordinates are NPs. (See section 2.6.)

(31)



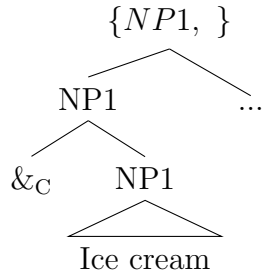
One of the basic facts that an analysis of coordinate structure should capture is coordination subgroups as in (32b). Here *milk and cookies* is subgrouped within the coordinate phrase. So what is coordinated is *ice cream* on one hand and *milk and cookies* on the other. Coordination in (32a) is just like the coordination above, no subgrouping.

(32) a. [Ice cream and milk and cookies]

b. Ice cream and [milk and cookies]

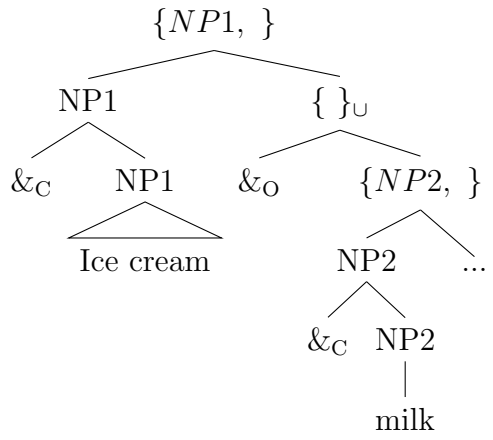
The derivation of (32b) proceeds as follows. *Ice cream* is selected by a closed coordinator &$_{\text{C}}$. A set label is projected, but not yet filled.

(33)



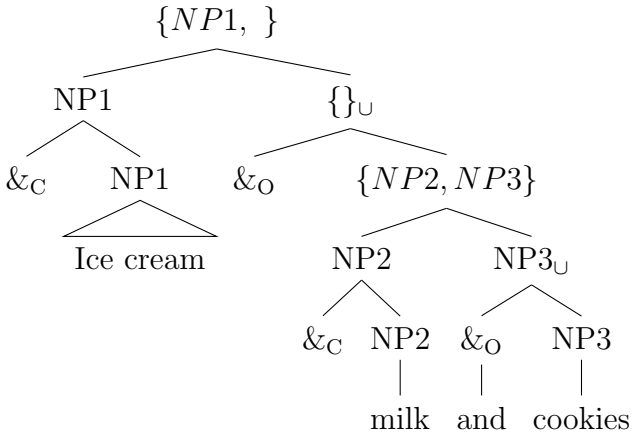
A subgroup is a sub-coordinate complex, so I assume that the sub-coordinate's initial coordinator should be a closed coordinator as well. Thus the subgroup is a single constituent for the grammar. Therefore, I also assume that the subgroup is selected by an open coordinator, as shown below. Within the subgroup, a closed coordinator combines with *milk*, and a set node is projected, with NP2 as a member.

(34)



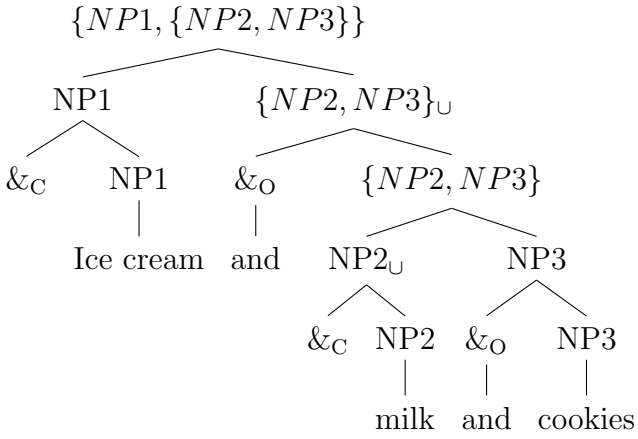
Then, an open coordinator combines with *cookies* to form NP3$_{\cup}$. NP3$_{\cup}$ merges with the structure. The union feature is deleted and the set node becomes $\{NP2, NP3\}$.

(35)



Note that the union feature on the subgroup is outside the set label. No union operation has access to the subgroup other than the union feature the combines NP2 with NP3. Now when the subgroup's label is added to the coordinate's topmost label, it will be added as a set. Thus, the label of the whole coordinate becomes $\{NP1, \{NP2, NP3\}\}$.

(36)



Evidence for treating a subgroup as a memeber in the coordinate superset is agreement in languages that have dual number, like Arabic. The Arabic equivalent to

(32b) induces dual agreement. In other words, the subset of $\{milk, cookies\}$ acts like a singular in the superset { ice cream, {milk, cookies}}, as shown below.

(37) Modern Standard Arabic

al-muθallažat wa-l [kaʕk wa-l ħaliib] laðiið-an fi-S-Sabaaħ
the-ice.cream and-the [cookies and-the milk] delicious-DU in-the-morning

'Ice cream and [milk and cookies] are delicious in the morning.'

Now I briefly turn to interpretation issues. I assume that the coordinate set is interpreted by unpacking the set. If entities are coordinated, then the set is construed as a set of entities. If verbs are coordinated, then the set is construed as a set of functions. For instance, the coordinate *bikes and jogs* is a set of two functions $\lambda x.\{$x bikes, x jogs$\}$. When this set shares some argument, I assume that it is the role of semantics to unpack the set as in (38b).

(38) a. John [bikes and jogs].

b. {bikes, jogs} (John)= {John bikes, John jogs}

A nominal coordinate can have a joint reading in which the conjuncts are construed as a single unit such as in (39a) where *a friend and colleague* is an intersection of the property *friend* and the property *colleague*. *And* here is referred to as *intersective* (Champollion 2015). Compare this to (39b) in which *a friend and colleague* has a collective reading.

(39) a. [A friend and colleague] is coming over for dinner.

b. [A friend and colleague] are coming over for dinner.

It is important to note that for a coordinate to be interpreted as singular is not specific to coordination. A plural can be interpreted as singular as well, as in (40). So this must be something related to the semantics of plurals more generally. (See Link 1983 for a semantic account of plurals.)

(40) [Tuna and mayonnaise] is one of the most popular spreads out there.

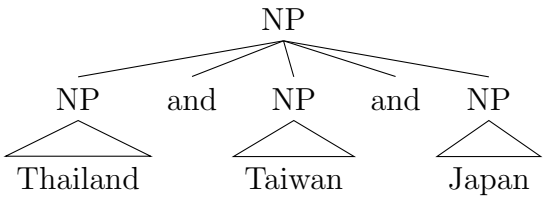
To summarize, I have proposed that coordinate complexes are special in that they require Set Label. Set Label is when a coordinate complex's label is a set of the labels of its conjuncts. I motivated Set Label from facts about agreement feature resolution. Before I end the section, I need to say that I assume that disjunctions (coordination with *or*) and adversative coordination (coordination with *but*) are also assigned a set label. However, while the relation between the set members in conjunction (coordination with *and*) is more of a list, the relation between conjuncts in *or* and *but* coordination is not a list. It is the role of the semantics of the coordinator to determine the relations between set members. It is beyond the scope of this dissertation to investigate the semantics of these constructions. (For an overview of the syntax of adversative coordination, see Vicente (2010). For an analysis of disjunctive structure, see Schwarz (1999).)

2.2 The Issue of Branching

The earliest structure of conjunction was assumed to be multiple branching. This structure has been adopted in many works, including, Dik (1968), Goodall (1987), and Muadz (1991). Some current literature still adopts multiple branching structures (Takano 2004). In multiple branching structures, all conjuncts are on par and a coordinator appears to have an equal status to the conjuncts'.

(41) Mary has been to [Thailand, Taiwan and Japan].

(42)



One argument in favor of a multiple branching structure is the immobility of the coordinator and the rightmost conjunct as a single constituent. This is supposed to

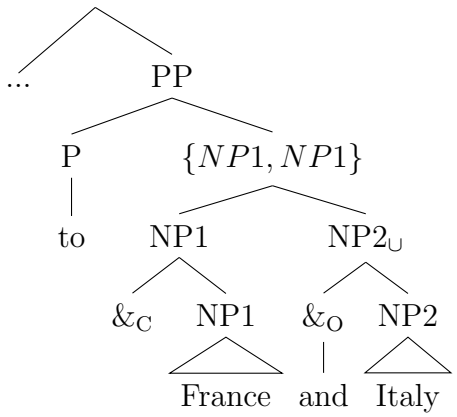
show that they do not form a constituent (Dik 1968). In (43b), topicalizing *and Italy* is ungrammatical.

(43) a. John went on a trip to [France and Italy].

b. And Italy $_i$ John went on a trip to [France $\__i$].

In my analysis, the coordinator and the conjunct do form a constituent. The ungrammaticality of (43b) does not show that a coordinator plus a conjunct is not a constituent. It is ungrammatical because moving the coordinator and the conjunct is illicit. Doing so is a violation of the Coordinate Structure Constraint (CSC). (See section 4.1.)

(44)



The constraint on moving the coordinator plus the conjunct does not constitute a strong argument for their being a single constituent. If we use the same reasoning, a conjunct should be allowed to move since it is considered a constituent in multiple branching structures. This clearly is not the case. In (45), it is ungrammatical to topicalize *Italy* although it is a constituent in a multiple branching structure.

(45) *Italy John went to [France and _] .

Another argument is that material may intervene between the coordinator and the conjunct. This indicates that they cannot be a single constituent. It was claimed

that in cases such as (46) the clause *as he said to me yesterday* intervenes between *but* and the conjunct (van der Lubbe 1958). However, the sentence does not show that the coordinator and the conjunct do not form a constituent.

(46) John will come today but, as he said to me yesterday, he will not be able to stay for the weekend. (Zhang 2010a, 18, (2.15a))

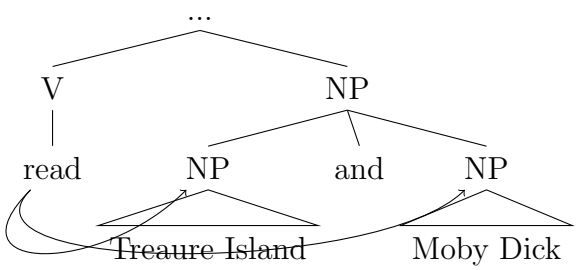
As pointed out by Zhang 2010, the clause is an adverbial adjoined to the following clause, so what appears to be intervention is actually a subconstituency within the conjunct. This is independently allowed as in (47).

(47) As he said to us yesterday, he will not be able to stay.

Dik (1968) argues that multiple-branching structure captures the parallelism property of coordination. This implies that conjuncts should not have a hierarchical relation because this violates parallelism. One instance of parallelism is thematic parallelism. In particular, when a coordinate is an argument of some head, all conjuncts are assumed to hold a thematic relation to that head. In (48), the verb *read* is construed with both *Treaure Island* and *Moby Dick*. Therefore, the conjuncts are expected to be parallel.

(48) I will read [*Treasure Island* and *Moby Dick*] this month.

(49)



Compare this to adjuncts and complements in (50) in which the verb does not have a thematic relation with an adjunct that is a subconstituent of its complement.

(50) a. I bought a book about physics ≠ I bought physics.

b. I read a book with a blue cover ≠ I read a blue cover.

But what does it mean for a coordinate to be parallel? If what is meant by parallelism is semantic parallelism, there seems to be a semantic parallelism requirement in specific types of coordination, specifically symmetric coordination. In symmetric coordination, conjuncts must be of the same semantic type. For example, in (51), two syntactically mismatched categories are coordinated, an AP and a PP, but they have the same semantic type (See section 2.5). Here the conjuncts seem to be pragmatically parallel, that is reversing the order of conjuncts do not affect the grammaticality or change the meaning.

(51) Pat is [healthy and of sound mind]. (Bayer 1996, 580, (5c))
($\langle e,t\rangle$ & $\langle e,t\rangle$)

In contrast, in asymmetric coordination, conjuncts are linked logically and do not seem to have a pragmatic parallelism. By pragmatic parallelism, I mean that changing the order of conjuncts can affect the meaning, as in (52) or the grammaticality of the sentence (See section 2.5.)

(52) a. Another news story about the data leak appears, and John will definitely go out and get a lawyer.

b. John will definitely go out and get a lawyer, and another news story about the data leak appears.

Since not all cases of coordination exhibit parallelism, multiple branching is right for parallel cases, but not for asymmetric coordination.

Multibranching structures were dispensed with in more recent syntactic theories such as X-bar syntax (Kayne 1994). As pointed out in (Munn 1993), multiple branching structures are either non-headed or multiheaded, thus it violates x-bar theory.

To integrate coordinates into this system, one constituent has to be the head of the complex, which is the coordinator in most binary branching analyses. There are

a number of arguments that have been used to argue for binary branching structures. Among these is the asymmetry between conjuncts in binding. The first conjunct may bind into the second conjunct but the second conjunct may not bind into the first (Munn 1993; Wilder 1994; Progovac 1998a, Progovac 1998b; Camacho 2003; Zhang 2010a).

A remark about the crucial role of binary branching in syntax was put forth by Collins (1997). He remarks that, "The basic idea is that phrase structure is binary because binary Merge is the smallest operation that will ensure that some structure actually gets built." (Collins 1997, 76). Thus, for Collins, binary branching is more efficient. Efficiency lies at the heart of Minimalism as spelled out in the Strong Minimalist Thesis (SMT). Binary branching is more efficient than multiple branching because it guarantees that some structure is built.

(53) (Chomsky 2013, 38)

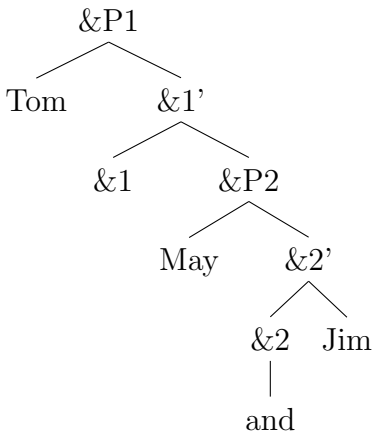
"...the principles of language are determined by efficient computation and language keeps to the simplest recursive operation, Merge, designed to satisfy interface conditions in accord with independent principles of efficient computation."

Thus, according to Collins, binary branching is not a mere preference but rather derives form the fundamental thesis of minimalist program. I dopt this view in my analysis. As shown in section 2.1, the coordinate structure is built via MERGE that takes two constituents to form a larger constituent. However, I have shown that coordinates are different from simple phrases in that they involve Set Label. The label of the coordinate complex is a set of the categories of its conjuncts. This is motivated by agreement resolution facts.

Now I review some of the prominent binary branching structures that have been proposed in the literature. Binary branching structures have two main forms: complementational structure and adjunctional structure. To start with complementational structures, the complementational structure analysis has many versions. It may be

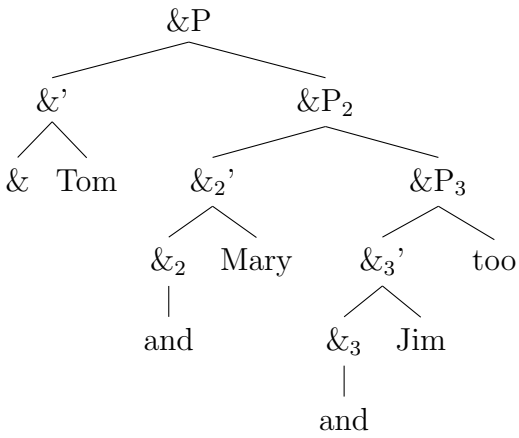
a structure in which the final conjunct is a complement of & head, while the rest of conjuncts are specifiers of a recursive &P, as proposed by Johannssen (1998).

(54)



The complementational analysis can also be a structure in which each conjunct occurs as a complement of & which projects a conjunct phrase &P. This structure was proposed in Collins (1988). As shown below the first conjunct is selected by a null coordinator which projects an &P, while the rest of conjuncts are recursive complements dominated by a right sepecifier.

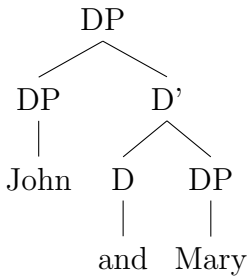
(55)



A recent version of the complementational structure analysis is Zhang (2010a), in which she eliminates the &P label and uses the category of the first conjunct as a label. She explains this choice by pointing out the importance of eliminating construction specific categories. However, &P is not any more construction specific that infl, C, or T which are not eliminated in Minimalism, for instance.

Zhang assumes that in nominal coordination, conjuncts are DPs. She assumes that the coordinator is a D that projects a DP phrase. It is not clear to me how a coordinator could be a D, though, since phrases of any category may be coordinated, and conjuncts may have their own Ds (e.g. *the man and the woman*).

(56)

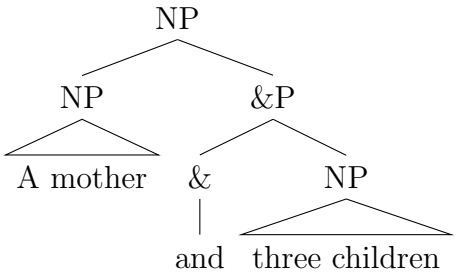


A property complementation structures share is that a coordinator selects a conjunct as an argument. In some versions the first conjunct is a complement of & head as in Collins'. In my analysis, the coordinator is more like an adverb. An adverb does not project an AdvP when it combines with a VP; instead what it combines with projects. The coordinator combines with the conjunct but does not project an &P, for instance.

Moving to adjunction structures, under adjunction structures, a coordinate complex involves adjunction between conjuncts. In one of its versions, &P is adjoined to the first conjunct (Munn1992, 1993; Bošković and Franks 2000; Hartmann 2000), as shown in (58) for (57).

(57) [A mother and three children] arrived late on purpose. (Progovac 1998b, 4, (33))

(58)



The arguments for the adjunction structure analysis are similar to those for the complementational structure analysis. They mostly highlight the fact that there appears to be a hierarchy between conjuncts on the basis of binding, selection and agreement facts. The first conjunct is assumed to be prominent, while the rest of the conjunction phrase is an adjunction to it.

One problem with adjunction structures is that an adjunct may move but the conjunct or the combination of the coordinator plus the conjunct may not. Fronting the adjunct clause headed by *after* is possible (59b), but fronting the coordinator plus the conjunct that follows it is not (60b).

(59) (Weisser 2015, 33, (13a); adapted)

a. Peter bought the new bestseller after he went to the bookstore.

b. After he went to the bookstore, Peter bought the new bestseller.

(60) a. Peter went to the bookstore, and he bought the new bestseller.

b. * And he bought the new bestseller, Peter went to the bookstore.

Most of the justifications of complmentation and adjunction structures were related to binding, agreement, and selection facts, among others (Munn 1993; Johannessen 1998). The defining factor was to have the first conjunct c-command the rest of the conjuncts. In section 2.6 and in chapter 3, I show that selection and agreement are linear phenomena, so they do not show anything about hierarchy. In section 2.4, I will show that binding is also affected by precedence.

In my analysis, the coordinate structure does not involve adjunction. A coordinator is adjoined to every conjunct, including the initial conjunct. The significance of the coordinate initial coordinator is to trigger Set Label in a left to right derivation. Conjuncts are on par because they all end up as members of a set, so no prominence of any conjunct is assumed.

2.3 Headedness and Constituency

Some analyses of coordinate structure assumed that the coordinator is a head that projects a coordinate phrase (&P). In this section, I discuss the various problems with this proposal, and conclude that a coordinator does not project a special phrase. Then I will discuss the issue of constituency. I will propose that although English does not allow coordinate initial coordinators, the constituency of *John and Mary* should be [[& John] [& Mary]]. This analysis is supported by crosslinguistic facts as well as the behavior of conjuncts with respect to movement.

2.3.1 Headedness

Coordinators have often been considered heads that project a conjunct phrase and select arguments (Munn 1993, 1999a; Kayne 1994; Johannessen 1998; Zhang 2010a, among others). In other work, however, coordinate phrases are considered exocentric and coordinators are not heads, as in Head-Driven Phrase Structure Grammar (HPSG) (Pollard and Sag 1994), Lexical Functional Grammar (LFG) (Dalrymple and Kaplan 2000; Bresnan 2001) and Categorial Grammar (Bayer 1996; Steedman 2000).

In my analysis, The coordinator adjoins to the conjuncts, but does not project a special conjunction phrase (&P, ConjP, or BooleanP):

(61)


So in my analysis, coordinators are similar to AdvPs in that they select the constituents they combine with, as I will show below, but do not project a phrase.

A number of diagnostics have been proposed to test for head status of coordinators, but most of them are not conclusive (te Velde 2005; Chaves 2012b). Among these are the ones proposed in Johannessen (1998) which are: the semantic functor (Hudson 1987), Distributional equivalence, and obligatoriness. If we go briefly over these diagnostics, we see that none of them show that a coordinator is a head.

The semantic functor is the element that describes the thing described by the phrase (Zwicky 1985). For instance in *inside the box*, *inside* is the functor because it describes the location described by the prepositional phrase. Neither the coordinator nor the conjuncts are semantic functors in this sense. For example in *salt and pepper*, neither *and* nor *salt* describes the entities described by the whole coordinate complex.

Another criterion is distributional equivalence. A head may replace the whole phrase without any impact on the meaning or the grammaticality (62). It is clear that neither a conjunct nor the coordinator may replace the coordination phrase. The result of having one conjunct replace the coordinate is a change of meaning (63a,b). It is ungrammatical for a coordinator to replace the coordinate (63c).

(62) The movie that was recently released caused public outrage. = The movie caused public outrage.

(63) The poems and essays of T.S. Eliot are so impressive.

a. ≠ The poems of T.S. Eliot are so impressive.

b. ≠ The essays of T.S. Eliot are so impressive

c. *[and] of T.S. Eliot are so impressive.

I think the only valid argument for head status for a coordinator is the fact that some coordinators c-select conjuncts. In some languages, certain coordinators occur with only a subset of categories, such as in Chinese, Japanese, Somali, Turkish, among many other languages (Johannessen 1998; Haspelmath 2004; Zhang 2010a).

For instance in Mandarin Chinese, the coordinators *gen*, *tong*, *yu* and *ji* combine only nominals, while *erqie* and *you* cannot combine nominals.

(64) (Zhang 2010a, 46, (3.3))

a. Dai Jiaoshou xihuan he [pijiu gen/*you lü-cha].
Dai Professor like drink [beer and/and green-tea]
'Prof. Dai likes to drink beer and green-tea.'

b. Dai Jiaoshou [shanliang you/*gen youmo].
Dai Professor [kind and/and humorous]
'Prof. Dai is kind and humorous.'

Haspelmath (2000) reports similar selectional effects in Korean and Turkish. In Korean, the suffix *-(k)wa* is used to combine NPs while the suffix *-ko* is used to combine verbs, which Haseplmath refers to as event coordination.

(65) a. yenphil-kwa congi
pencil-and paper
'pencil and paper' (Martin and Lee 1986, 51)

b. Achim mek-ko hakkyo ka-ss-eyyo.
breakfast eat-and school go-PAST-IND
'I ate breakfast and went to school.' (Haspelmath 2000, 18, (57b))

Adjuncts also c-select; AdjPs c-select Ns, while AdvPs c-select other categories, but neither projects . I view coordinators as similar.

The earliest motivation behind postulating a conjunct phrase is to integrate the coordinate structure into the x-bar syntax, and the only way was to posit an &P headed by the coordinator.

Now I will go through the arguments for &P and show that they are weak and a coordinator should not project an &P. Johannssen (1998) claims that positing &P with a specifier and a complement is crucial in accounting for unblalanced coordination. Unbalanced coordination is a general term that describes coordination with mismatches in features between the conjuncts. The mismatch can be in Case and/or agreement. For example, in English conjuncts may mismatch in Case as in (66) in which accusative

and nominative Cases are combined. Similarly, in Jordanian Arabic nominative and accusative combine in subject position in which nominative Case is the usual Case (67).

(66) [She and him] will drive to the movies. (Schwartz, B.D. 1985, 165, quoted in Johannessen 1998)

(67) Jordanian Arabic

[ana w iyyak] rah n-safir sawa
[1SG and 2SG.ACC] FUT 1PL-travel together
'Me and you will travel together.'

Johannessen (1998) notes that when a coordinate occurs as an argument of some head, the first conjunct must satisfy the selectional requirements of that head, as reproduced below.

(68) (Sag et al. 1985, 165,(124b),(125b))

a. You can depend on [my assistant] and [that he will be on time]. (Gazdar et al. 1985)

b. * You can depend on [that my assistant will be on time].

I am going to show that linear order is what matters for these cases in section 2.6.

In Johannssen's analysis, the first conjunct, being a specifier, can have its categorial features percolate up to the conjunct phrase via the head (also Zhang 2010).

Replying to Johannssen's claim that a specifier may transfer its features to the head and then to the projection, Borsley (2005) points out that the specifier does not always have the same features as the head in constructions other than coordinates. For instance in (69), the specifier *which books* has plural number but the whole projection *which books kim read* is singular. In addition, the head does not have to have the same Case as the specifiers. In (70), *children's* is genitive, while *room* is accusative.

(69) [CP Which books Kim read] is/*are unclear. (Borsley 2005, 476 (72))

(70) I saw [NP the children's room]. (Borsley 2005, 476, (71))

In addition, under the analysis in which the first conjunct is a specifier in a coordinate that contains two conjuncts, the first conjunct is not predicted to be selected by a coordinator. However, languages that allow coordinate initial coordinators defy this assumption. French and Polish, for instance, allow conjunct initial coordinators. Under Johannssen's analysis, conjunct initial coordinators must receive a special analysis because they do not project a specifier.

(71) Le suspect sera [et interrogé et fouillé]
The suspect will-be and questioned and searched.
'The suspect will be questioned and searched.' (Mouret 2004, 3, (4b))

An additional argument for &P, which I also wish to argue against is the one advanced in (Collins 1988). Collins claims that conjunction adverbs argue for &P. Collins contends that the adverbs as in (72) do not modify the NPs. They are licensed by the coordinate structure itself.

(72) (Collins 1988, 5, (2a,c))

a. [John and maybe Mary] went to the store.

b. [Perhaps John, maybe Mary, and certainly Bill] went to the store.

Collins excludes the possibility that these adverbs modify clauses that have undergone ellipsis on the basis of examples like (73b,c). The ungrammaticality here is due to the fact that *get together* is a collective predicate that requires a plural subject.

(73) a. [The treasurer, the president, and perhaps the CEO] will get together tonight to hammer out an agreement. (Collins 1988, 17, (26c))

b. * Perhaps the president will get together tonight...

Collins' only evidence against NP modification is the following sentence:

(74) ???John kicked evidently his daughter. (Collins 1988, 9, (9f))

However, we can make *evidently* grammatical with a longer NP and a short pause, too.

(75) John kicked, uh, evidently the girl with the red jersey.

Adjoining to NPs seems to require certain pragmatic contexts. Coordination in particular is one of these contexts, but not the only one. Here are some attested examples. *Evidently* is better with *the same* and with superlatives:

(76) a. The two reciprocal crosses gave evidently the same result...[2]

b. The gentlemen good-humouredly surrendered themselves to this impulse, and gave evidently the highest possible pleasure to scores of their father's admirers.[3]

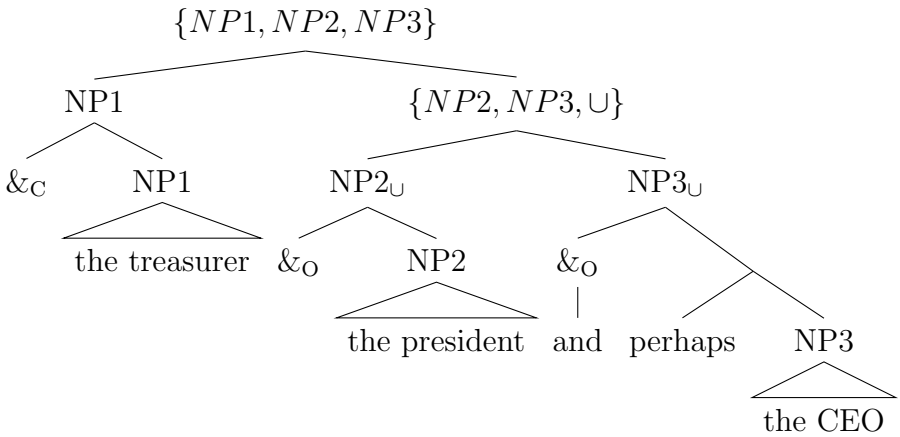
In addition, some adverbs which Collins call conjunction adverbs are highly acceptable in the same context. Thus, so-called conjunction adverbs do not show anything about conjunction.

(77) a. John will visit perhaps his uncle.

b. John will hate probably his uncle the most.

Therefore, I argue that an adverb like *perhaps* can modify the NP. So, the structure of the coordinate I propose for (73a) is as shown below.

(78)



[2] https://books.google.com/books?id=Ea_zAAAAMAAJ

[3] https://books.google.com/books?id=KWxAAQAAMAAJ

Other arguments against &P come from head coordination and word part coordination. If the coordinator is a head that projects arguments, and if arguments must be maximal projections, it is not clear how we can account for word level and morphological level coordination in &P analysis.[4]

(79) Kim is studying pre- and post-verbal clitics. (Borsley 2005, 473, (56))

(80) (Chaves 2008, 262, (4))

a. Elemental mercury is used in gold-mining and -refining.

b. This product was hand-made and -packed.

Therefore, the claim that a coordinator projects a conjunct phrase runs into a lot of problems. Even c-selection does not argue for &P. Adverbs and adjectives c-select, but they do not combine with their selected objects as complements or specifiers. An adverb c-selects a VP and an adjective c-selects an NP, but neither one takes the constituent it c-selects as an argument or a specifier.

In my analysis, the coordinator functions more like an adverb. It may c-select the conjunct, but it does not project an &P. The projection of merging the coordinator and the conjunct is of the same category of the conjunct. The only difference is that when an open coordinator combines with a conjunct, the projection is endowed with a union feature. No special projection of the coordinator is assumed.

2.3.2 Constituency

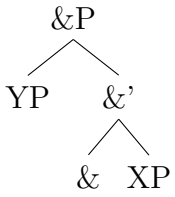
Now I turn to the issue of constituency. I will focus on constituency in a two-conjunct coordinate in a language like English. The constituency that has been assumed in most previous literature is the following:

[4] However, these particular examples received ellipsis analysis by many. So, these cases might not argue against &P. See Booij (1985) and Chaves (2008).

(81) YP [and XP]

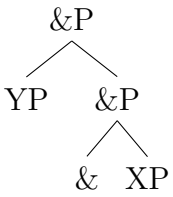
We have seen that in complementational structures, YP is the specifier of &P and XP is a complement of &.

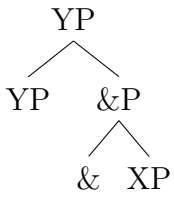
(82)



Adjunctional structures can take two forms: one in which YP is adjoined to &P (82a), and one in which &P is adjoined to YP (82b).

(83)

a. 

b. 

In all these structures, the first conjunct is not selected by a coordinator even when it is a specifier. Among the arguments for this assumption is the claim that the first conjunct may be dropped in some contexts, which is taken to establish constituency; *and XP* go together, excluding the first conjunct. In (84), a conjunct, which is understood from the context is dropped (Hankamer and Sag 1976).

(84) [Observing that the toddler started to walk]
And he is only nine months old!

Conjunct drop also occurs with *or* and *but*, as shown below.

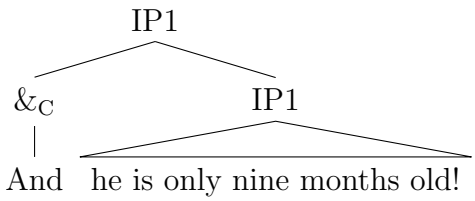
(85) [A prisoner is about to be executed].

a. Prisoner: But I am innocent!

b. Prisoner: Or you could set me free!

I do not think that cases like the one above involve conjunct drop. Following Grosu (1981) and Merchant (2001), I assume that dropping a conjunct violates the first part of the Coordinate Structure Constraint (CSC), namely the Conjunct Constraint (CC), assuming that the CC is a constraint on pronunciation. (See section 4.1.1.) I believe that the sentences above are special. The sort of coordinator is different from the one in regular cases of coordination discussed above. I hypothesize that this coordinator is a special type of closed coordinators, an overt one. We have seen that in English, closed coordinators are null. I propose that English also allows overt closed coordinators in this particular context, namely when the coordinator occurs discourse initially.

(86)



Intervention between the first conjunct and the coordinator plus the second conjunct in two-conjunct coordinates also led some to believe that the coordinator plus the second conjunct form a constituent that excludes the first conjunct (Collins 1988; Munn 1992; Zoerner 1995; Progovac 1998a). An example of intervention is included below:

(87) Jane checked out a novel from the library yesterday, and a journal.

However, the apparent intervention above is a surface result of clausal coordination plus ellipsis as pointed out by many (**?**; Moltmann 1992; Schwarz 1999, and many others), and as I illustrate below.

(88) [IP Jane Checked out a novel from the library], and [IP [a journal] ~~[IP Jane checked out t_i from the library.]~~]

Evidence for this analysis is that in similar examples, a collective verb is not licensed. *Hug* is a collective predicate that requires a plural argument. The ungrammaticality of sentences (89b,c) indicates that *Jane* and *Jill* are not base generated in a conjunction phrase and they cannot form a plural argument which is what the verb *hug* requires. The sentence is in fact clausal coordination that has undergone ellipsis, as in (90).

(89) a. Jane and Jill hugged.

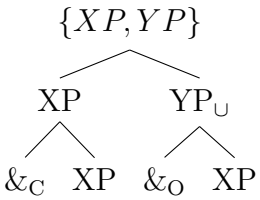
b. *Jane hugged, and Jill.

c. *Jane hugged and Jill hugged.

(90) *Jane hugged and [IP Jill [IP ~~hugged~~.]]

Thus, I conclude that conjuncts should have an equal status in that neither conjunct is allowed to move or to be dropped. The constituency I assume is as schematized in (91). Although the coordinator is a head that may select an argument, the first conjunct is not a specifier or an argument of the lower coordinator (the one that selects XP).

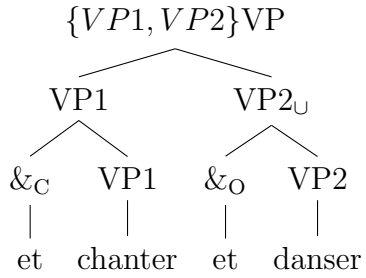
(91)



Besides, my analysis allows coordinate initial coordinators, such as in French, without further assumptions. Note that $\&_C$ can be pronounced in French, but it is null in English.

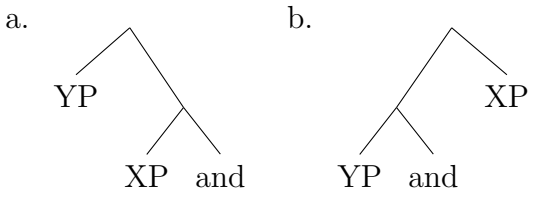
(92) Il veut [et chanter et danser].
He wants and to-sing and to-dance.
'He wants to sing and dance.' (Mouret 2004, (4a))

(93)



The last issue that I wish to address is the head parameter and coordinate structure. Johannessen (1998) proposes that a coordinate structure has a compelementation structure that mirrors the VP structure. She extends this analysis to head final languages. Thus, the word order of a coordinate mirrors the word order of a VP in a head final language. I shematize the possible structures under Johannessen's analysis below.

(94)



However, typological studies have shown that the position of the coordinator in a language does not correlate with the order of verb and object in that language. Zwart (2005) surveyed 162 languages, half of which were head-final and the other half

of which were head-initial. Zwart categorizes these languages into two groups in terms of strategies for coordination (Zwart 2005, 232). The first is when the coordinator is in the middle between two conjuncts (95a) as in English, and the second is when the coordinator follows the two conjuncts it combines as in (95b), where I include an example from Latin.

(95) Coordination Strategies tested in Zwart (2005)

a. A & B such as in English

b. A B & such as in Latin:

Marcus Julius-que
Marcus Julius-and
'Marcus and Julius' (Zhang 2010a, 14, (2.8))

The general results of the survey is that a large number of head-final languages apply head medial strategies in coordination, such as Basque and Canela.

(96) Basque, isolate

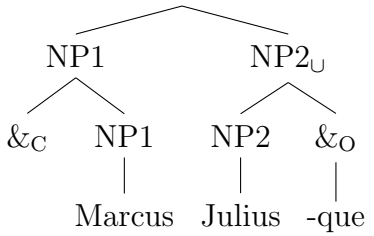
lagun eta ahaide-ei agur egi-n die
friend and relative-pl:dat salute make-perf aux
'He has greeted his friends and family.' (Saltarelli 1988:90)

(97) Canela, Macro Ge

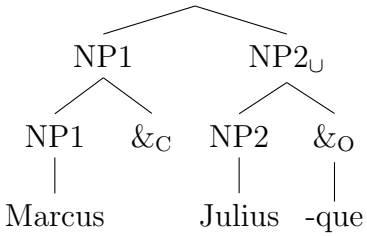
capi me kryt ma tẽ
Capi and Kryt away go
'Capi and Kryt go away.' (Popjes and Popjes 1986:150)

For the Latin example above, my analysis allows a coordinator to follow the conjunct. There are two possible structures which I diagram below. In (98a), the first coordinator might be a coordinate initial one just like in English. The non-initial coordinator follows the second conjunct. In (98b), both coordinators follow their conjuncts, but one is null, and the other is overt. In absence of evidence, both representations appear to be possible. Thus, coordinates are similar to adverbs and adjectives, which generally do not pattern with VO order in a language.

(98) a.



b.



To conclude this section, I have discussed the various arguments for head status of a coordinator. It turns out that there are many theoretical as well as empirical arguments against conjunct phrase (&P). In addition, I have shown that there is no correlation between the head parameter in a language and a coordinate structure.

2.4 Hierarchy

Now I move to the issue of hierarchical relations between conjuncts. In this section, I will discuss binding anaphora, quantifier binding, and NPI licensing within a coordinate complex. I will point out the problems with c-command, and will conclude that neither quantifier binding nor NPI licensing show anything about hierarchy in coordinates. I will adopt Phase Command (Bruening 2014) to account for anaphoric binding within a coordinate complex. I conclude that the facts about binding conditions, quantifier binding, and NPI licensing are indecisive. Thus, any structure as well as the structure I propose is compatible with the facts, once we understand the role of linear order.

2.4.1 Binding Conditions

Munn (1993) notes that binding from the first conjunct into subsequent conjuncts is possible while the opposite is not. In (99b), condition C is violated, apparently because the R-expression *John* is bound.

(99) (Munn 1993, 16, (2.8))

a. John$_i$'s dog and Him$_i$ went for a walk.

b. He$_i$/Him$_i$ and John$_i$'s dog went for a walk.

On the basis of the assumption that binding involves c-command, early analyses of binding conditions within a coordinate complex proposed that the first conjunct is more prominent and must c-command the rest of the conjuncts (Munn 1993; Collins 1988; Wilder 1994; Heim and Kratzer 1998; Progovac 1998a; Camacho 2003).

However, doubts have been raised about condition C violations like (99b). Progovac (1998a) points out that cross sentential coreference, where the pronoun occurs in one sentence and the R-expression occurs in the next, is also ungrammatical. Since condition C does not occur across sentences, the ungrammaticality of (100) might be due to a violation of some other principle. Whatever that principle is, it might rule out (99b), too.

(100) *He$_i$ finally arrived. John$_i$'s dog went for a walk (Progovac 1998a)

Additionally, many examples show that condition C is violated, even when the binder does not c-command the R-expression (Langacker 1969; Bruening 2014). In (101b), *him* does not c-command *Peter*, but condition C is violated. This points to a serious problem with c-command.

(101) (Langacker 1969, 162, (1),(2))

a. Penelope [cursed Peter$_i$ and slandered him$_i$]

b. * Penelope [cursed him$_i$ and slandered Peter$_i$].

Turning to binding condition A, an anaphor in the second conjunct cannot be bound by the first conjunct (Progovac 1998). This is the case in English, as shown in (102e).

(102) a. They hugged each other.

b. The boys hugged the girls.

c. The boys and the girls hugged.

d. the boys hugged each other.

e. The boys and each other hugged.

f. Each other and the boys hugged.

Similarly, in the Coatian example in (103), the anaphor *svoja* 'self' does not seem to be licensed even when an NP that is co-indexed with it occurs as the first conjunct.

(103) Croatian: (Progovac 1998a, (17))

[*Jovan$_i$ i svoja$_i$ zena] su stigli.
*John and self's wife are arrived

*'John and self's wife have arrived.'

Therefore, binding within coordination show that there is a problem either with the way coordinate structure is analyzed or with c-command as the configuration under which binding occurs. In fact, the second possibility is the case. Bruening (2014) reviews arguments for c-command as the configuration under which binding conditions are met, and shows that they run into problems. One of the problems involves objects of prepositions being able to bind in the material to their right, as noted in Reinhart (1976). In (104), a condition C violation occurs although the R-expression is not c-commanded by the pronoun.

(104) (Reinhart 1976, 155–56, (14b), (16b), (20c))

a. ?*It didn't occur to her$_i$ that Rosa$_i$ has failed the exam.

b. ?*Someone should point out to her$_i$ that Rosa$_i$'s driving is dangerous.

c. ??We talked with her$_i$ about Rosa$_i$'s son.

In addition, there are serious conflicts between constituency tests and c-command (Pesetsky 1995; Phillips 2003). If c-command stands for constituent command, then these conflicts should not exist. Among the examples that show that there is a conflict

is VP adjuncts. Constituency tests show that VP adjuncts are adjoined higher to the right of VP. In (105a,b), the fact that the VP adjuncts optionally participate in VP fronting shows that they are adjoined higher to the right of VP.

(105) (Bruening 2014, 384, (21))

I said that I would study entomology (in the library) (on Wednesdays), and...

a. ... study entomology I did in the library onWednesdays.

b. ... study entomology in the library I did onWednesdays.

c. ... study entomology in the library onWednesdays I did.

As pointed out by Bruening (2014), if c-command is correct, interaction between pronouns and R-expressions contained in two different VP adjuncts is not expected. This prediction is not true. Elements to the left command elements to the right (106), while elements to the right do not command elements to the left (107).

(106) (Pesetsky 1995, 177, (459)c-d)

a. * Mary played quartets with them$_i$ at [John and Sue]$_i$'s party.

b. * I threw the ball to him$_i$ on Friday during John$_i$'s speech.

(107) (Hestvik 1991, 464,(15)e–f)

a. I only think about John$_i$ near him$_i$.

b. I never say nasty things about my friends$_i$ near them$_i$.

Therefore, to account for binding facts, whether in coordinates or non-coordinates, we need to find an alternative for c-command. I will adopt Precede-and-Command where command is Phase Command proposed in Bruening (2014). Rather than c-command, Bruening proposes that the binding peculiarities receives a plausible analysis if the condition on binding is Phase Command. Phase Command is defined in (108).

(108) (Bruening 2014, 343, (2)-(3))

a. Phase-command: X phase-commands Y iff there is no ZP, ZP a phasal node, such that ZP dominates X but does not dominate Y.

b. Phasal nodes: CP, vP, NP

Thus, I redefine binding in terms of Phase Command in (109). For A to bind B, A must precede and phase command B.

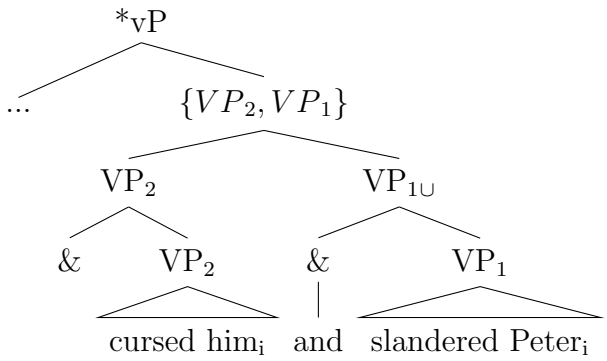
(109) α binds β if

a. *alpha* is co-indexed with β

b. α precedes and phase commands β

Now I explain how Precede-and-Command captures binding condition violations such (101b). The coordination in this example is a VP coordination dominated by the same phase node, vP. *Him* precedes and phase commands *Peter* because there is no phasal node that dominates *him* but does not dominate *Peter*. Therefore, condition C is violated and the sentence is ungrammatical.

(110)



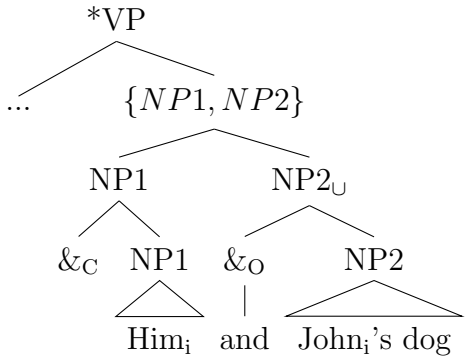
Now I turn to the grammatical case (101a). I think the grammaticality here can be explained by coargumenthood (Reinhart and Reuland 1993). The pronoun is grammatical in this context because the pronoun *him* and *Peter* are not coarguments.

Thus, there is no violation of condition B here. As for condition A effect, such as in the Croatian example in (103), the anaphor is phase-commanded by its antecedent. Still, the sentence is ungrammatical. Again, coargumenthood can explain the issue here. The NP in which the anaphor is contained can never be a co-argument with the anaphor's antecedent. The verb 'arrive' takes the coordinate as one argument in which the anaphor and its antecedent are conjuncts.

Ungrammatical cases such as in (99b), reproduced below, can be explained via Precede-and-Command. Under the analysis, the sentence involves a condition C violation. The pronoun precedes and phase-commands the R-expression. There is no phase node XP such that it dominates *him* but does not dominate *John*.

(111) He_i/Him_i and John_i's dog went for a walk.

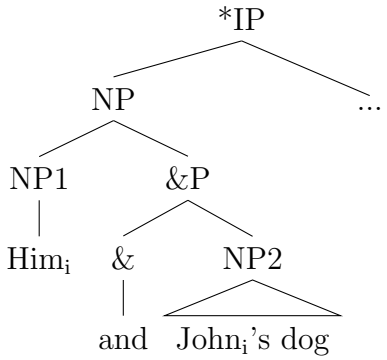
(112)



To summarize, I have pointed out the various problems with c-command as the configuration that facilitates binding anaphora. I have shown that violations of binding condition C where an R-expression within a coordinate is not licensed when its antecedent is in a preceding conjunct can be explained via Precede-and-Command, where command is Phase Command. As for violations of conditions A and C, as in the Croatian example, they are better explained via coargumenthood. Thus, binding anaphora facts do not argue for a specific hierarchy between conjuncts. In fact, almost all structures can capture the binding facts if Precede-and-Command is correct. Since

binding within the coordinate significantly interacts with linear order, any structure is compatible with the facts. Below I show that in all the structures that have been proposed in the literature are compatible with the facts. (113a) is adjunction structure, (113b) is complementation structure, while (113c) is a ternary branching structure. The pronoun *him* precedes and phase commands the R-expression in all of the structures, which results in a condition C violation.

(113) a.



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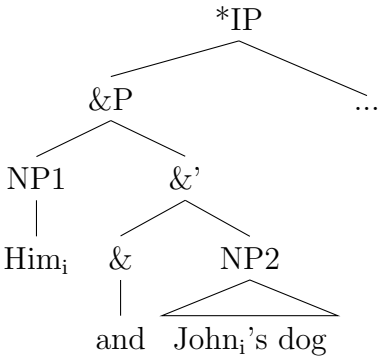
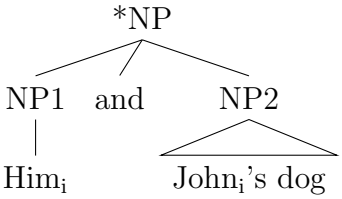


c.



2.4.2 Q-Binding and NPI licensing: Semantic Scope

Now I will turn to Quantifier binding and NPI licensing. These phenomena turn out to be governed by semantic scope rather than c-command. Thus, they do not argue for a specific hierarchical relation between conjuncts.

Since Reinhart (1983) until quite recently, quantifier binding has long been assumed to require c-command. On the basis of this general assumption, many researchers propose that a quantifier in the first conjunct which binds a variable in a following conjunct indicates a c-command relationship between conjuncts (Munn 1993).

(114) [Every$_i$ man and his$_i$ dog] went to mow a meadow. (Munn 1993)

However, recent studies introduce more data which show that quantifier binding occurs with no c-command between the quantifier and the variable on the surface (Barker 2012; Barker and Shan 2014). Barker (2012) includes a large number of examples, which show the quantificational binding does not require c-command. One example is quantificational possessors. A quatificational possessor may bind a quantifier outside its host NP (Higginbotham 1980; Reinhart 1983; Barker 2012).

(115) [Everyone$_i$'s mother] thinks he$_i$'s a genius. (Barker 2012, (22a))

In addition, binding from a complement of PP within NP and VP is also possible:

(116) a. The policemen turned [a citizen [of each$_i$ state]] over to it$_i$s governor. (Gawron and Peters 1990, 163)

b. A book was given [to every$_i$ boy] by his$_i$ mother. (Harley 2003, (64))

Coordinates are no exception. For a quantifier that occurs in a coordinate to bind a variable in another conjunct, the quantifier does not have to c-command the variable. In (117), which is a coordination of two adjunct clauses, the quantifier *each* in the first conjunct binds a variable in the second conjunct although the quantifier does not c-command it.

(117) (Barker 2012, (31))

a. .. . . . [after seeing each$_i$ animal] but [before categorizing it$_i$ on the computer] or [recording it$_i$ on their response sheet.]

b. .. . . . [after fetching each$_i$ pointer], but [before dereferencing it$_i$].

Thus, c-command is not required to account for quantificational binding. Barker proposes that what matters for binding is semantic scope. The scope of the quantificational expression can be quite different from its surface c-command domain. It is beyond the scope of the dissertation to explore this issue.

(118) Someone loves everyone. $\forall x \exists y$.loves x y

I should note that the highest A-position occupied by the quantifier has to precede the pronoun, or ungrammaticality results, as shown below.

(119) a. * ...after fetching it but before dereferencing each pointer.

b. * His$_i$ mother thinks [everyone$_i$'s son] is a genius.

c. * A book was given to him$_i$ by [everyone$_i$'s mother].

This is true in coordination as well, as shown in (2.4.2). This indicates that linear precedence is relevant to binding, rather than hierarchy.

(120) His dog and every man went to mow a meadow.

Turning to NPI licensing, traditional analyses of NPI licensing assumed that NPIs are licensed via occurring in the c-command domain of a downward-entailing (DE) operator (Ladusaw 1980). Progovac (1998a) and Hoeksema (2000), and others note that in coordination, negation in the initial conjunct does not license an NPI in a following conjunct.

(121) a. * He chased [nobody and any dogs]. (Progovac 1998a, 1, (19); adapted)

b. * [Few professors and any students] were at the party.(Hoeksema 2000, (15)a,c)

This was taken to indicate that the first conjunct does not c-command the rest of conjuncts. There are two possible responses to the issue of c-command here. The first is to change the coordinate structure so that *nobody* does not c-command *any dogs*, which Collins (1988) and some others assumed. The other is to deny the validity of c-command in NPI licensing. The second solution seems to be more plausible given the problems with c-command in binding conditions and quantifier binding.

In recent literature on NPI licensing, it is argued that an NPI is licensed in the scope of a non-veridical operator (Giannakidou 1998 and subsequent work). Veridicality is a property of sentence embedding functions. "Function F is veridical iff Fp entails or presupposes the truth of P. If inference to the truth of P under F is not possible, then F is nonveridical." (Giannakidou 2011, 1674-1675). For instance, positive

existentials may not license NPIs since they are veridical domains. In (122), the NPI is illicit because the proposition is veridical. The proposition '*a mouse exists in the basement.*' is entailed to be true, which is why *any* cannot be licensed.

(122) a. *There is any mouse in the basement.

b. ∃x∃w [x is a mouse and x is in the basement in w]

The Non-Veridicality theory of NPI licensing explains the ungrammaticality of sentences in (121) by definition. As pointed out by Giannakidou (1998), coordinates are veridical contexts because for a coordinate to be true both conjuncts must be true. (See Giannakidou (1999, 2006) for more details.)

Note that this is not the case in disjunctions in which an NPI in the second conjunct may be licensed by a DE operator in the first conjunct. Again this is explained by the fact that a disjunction is a non-veridical context because for the disjunction to be true, not all disjuncts must be true.

(123) I met [no professors or anyone else]. (Hoeksema 2000, (18a))

However, surface precedence appears to be relevant to NPI licensing. In (124), although the semantic context is non-veridical, being a disjunctive, the NPI is not licensed when not preceded by its licensor.

(124) *I met [any professors or no one else].

2.4.3 Summary

In this section, I have briefly discussed binding anphora, qunatificational binding, and NPI licensing in the context of coordination. I have shown that the facts show that c-command is irrelevant to binding and NPI licensing. I have shown that linear precedence is relevant to many cases of binding and NPI licensing. Thus, facts about these phenomena do not show anything about the hierarchy, and consequently, should not limit the way we analyze coordinate structure.

2.5 Parallelism in Coordination

In this section, I discuss the constraints on what conjuncts may be combined in coordination. I argue that syntactic category mismatch should be allowed. However, I adopt a view that conjuncts must be semantically parallel and propose that this applies to symmetric coordination only. Then I show that in addition to semantic parallelism, there appears to be morphophonological parallelism between conjuncts.

In early studies, it has long been assumed that coordination involves only constituents of the same syntactic category. Chomsky (1957) introduces the Law of Coordination of Likes (LCL) which dictates that only categories of the same type may be combined:

(125) A and B may be conjoined iff A and B are of the same syntactic type. (Bayer 1996, 279, (3))

In many cases of coordination, similar categories are conjoined as in (126), which seems to indicate at the first look that the LCL is true.

(126) a. [John] and [Mary] are coming. NP&NP

b. We still need the [[bat] and [ball.]] N&N

c. [[in London] and [in Berlin]], it is still cold. PP&PP

d. the [red] and [blue] flag AP&AP

e. Mary has [[left] and [gone to England.]].VP&VP

f. I don't know if [[Mary left] and [Peter returned.]] IP&IP (**?**, 293, (10))

However, the LCL can in fact be violated. Grammar overwhelmingly allows conjuncts mismatching in category to combine. One of the most common cases involves predicates. Any syntactic categories can be combined if they are both predicates, as shown below.

(127) 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] (Sag et al. 1985, 117, (2))

d. Pat has become a banker and very conservative. [NP and AP] (Sag et al. 1985, 117, (3a))

There have been many attempts to accommodate violations like the ones listed above and maintain the LCL. The first of these analyses is the PredP analysis (Chametzky 1987; Morril 1990; Sag et al. 1985; Camacho 2003). In this analysis, mismatched categories are subsumed under a more general category, namely PredP. The main assumption of this analysis is that mismatched categories like the ones above are in predicate position, and so all of them share the properties of being part of a predicate.

(128) a. I consider John crazy and a fool. (Bowers 1993, (23a))

b. I consider John [$_{\text{PredP}}$ crazy] and [$_{\text{PredP}}$ a fool].

However, the PredP analysis cannot capture different selectional properties of ECM verbs (Bayer 1996, footnote 8). For instance, unlike *consider*, which allows PP, AP and NP predicates as complements, *make* takes AP and NP but not PP. *Become* does not allow VP or PP.

(129) (Bayer 1996, Footnote 8, (i), (ii))

a. I consider John crazy/a fool/above suspicion.

b. I made John crazy/a better linguist/*above suspicion.

c. Danny became an atheist/antisocial/ *in a bad mood.

The PredP analysis cannot capture the differences between these complements if they are all PredPs. There is no way to distinguish predicative categories in the lexical entries of these verbs.

In addition, some cases of mismatched categories cannot be explained in the the PredP analysis such as in (130), in which the mismatched categories are complements of a P, which is not a predicate position.

(130) You can depend on [my assistant and that he will be on time]. (Gazdar et al. 1985)

Furthermore, PredPs cannot account for cases such as in (131) where the mismatched categories are adverbs not predicates.

(131) a. We walked [slowly and with great care]. [AdvP and PP]

b. I consider that [a rude remark and in very bad taste].[NP and PP] (Sag et al. 1985, (3b))

Therefore, attempting to accommodate category mismatches as PredPs does not seem right as a general solution.

The second solution to category mismatch is to assume that what appears to be category mismatch is a reflex of clausal coordination plus ellipsis (Wilder 1994). Wilder (1994) argues that coordination falls into two types: NP coordination and CP coordination. All other types of coordination are derived via ellipsis. Wilder is non-committal in terms of what deletion means. He remarks that either the elided constituents are null elements or they are deleted at PF. In (132), 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.

(132) [John is [NP a republican]] and [~~John is~~ [AP proud of it]] (Wilder 1994, 304, (59))

Although many cases of category mismatch can be explained via clausal coordination plus ellipsis, the ellipsis account runs into problems. For instance, Wilder's analysis ought to allow mismatches, such as (133a). Here the output of ellipsis is ungrammatical.

(133) (Peterson 1981, 449)

a. * John sang beautifully and a carol.

b. John sang beautifully.

c. John sang a carol.

(134) [John sang beautifully and [~~John sang~~ a carol]].

In addition, the ellipsis analysis does not account for mismatches in examples like (130). Clausal coordination plus ellipsis will not solve the problem here, because *on* simply does not allow CPs. One could solve the problem by positing movement. That is, coordination of CPs and NPs might be analyzed as clausal coordination, with movement plus ellipsis in the second conjunct:

(135) You can depend on my assistant and [[that he will be on time] ~~you can depend on *t*~~]

This solution will not work for other cases, however. For instance clausal ellipsis does not work for (136a). The input to ellipsis would have to be ungrammatical, as in (136b). Such a case would also require clausal coordination in the middle of the antecedent clause, unlike the examples above where the coordination is peripheral.

(136) (based on an example form Gazdar et al. 1985)

a. It was by the children's noise and that their parents did nothing to stop it that Pat was annoyed.

b. * It was by the children's noise] and [~~it was~~ that their parents did nothing to stop it] that Pat was annoyed.

Therefore, neither assuming that mismatched categories are PredPs nor postulating clausal coordination plus ellipsis appears to be plausible as general solutions to category mismatches.

Bayer (1996) proposes a solution to coordination of unlike categories in Lambek Categorial Grammar (LCG), inspired by ideas discussed in Morril (1990). In (137), *remember* takes a coordinate of an NP and a CP as an argument. Bayer proposes that the verb *remember* is listed in the lexicon as taking ($\vee$) category. *Remember* permits both NPs and CPs. This means that the verb can take a disjunction of categories as an argument.

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

Nevertheless, Bayer's analysis does not capture cases in which selectional restrictions are not actually respected, as in (138). In many cases, a verb may combine with a coordinate in which not all conjuncts are possible dependents of the selecting head. Consider the examples below again. According to Bayer's analysis, the preposition *on* should be listed as selecting NP and CP but this is not true. Sentence (138b) is ungrammatical because *on* requires an NP and does not permit a CP.

(138) 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].

Consequently, coordination of mismatched categories should be allowed. However, there appears to be other sorts of restrictions on combination in coordination. Munn (1993) notes that although mismatched categories are allowed to combine, it seems that coordinates must match in semantic type. In (139), *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 <e,t>.

(139) 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.

(140) a. We walked [slowly and with great care]. (Sag et al. 1985, 140, (57))

b. They wanted to leave [tomorrow or on Thursday]. (Sag et al. 1985, 143, (69a))

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

(141) a. * That man is [a republican and John]. ($\langle e,t\rangle$ & $\langle e\rangle$)

b. * He lost [carelessly and unfortunately]. (event modifier & proposition taking adverb)

c. * Barlow thinks [that he's smart and whether he should go]. ($\langle t\rangle$ & $\langle t,t\rangle$; a set of propositions)

All of this indicates that coordination does not care about syntactic category, only semantic type. This semantic restriction, however, does not apply to all types of coordinates. In asymmetric coordination, unlike semantic types may be coordinated, as in (142), where an imperative is coordinated with an affirmative. In many analyses, these are considered distinct semantic types. (For an analysis of the semantics of imperatives, see Portner (2007).)

(142) Do that and you will suffer.

Therefore, it appears that coordination is unusual in not imposing restrictions on what the syntactic categories may be coordinated. So long as the conjuncts can combine semantically with shared material, the combination will be grammatical (subject to some constraints discussed below).

Now I turn to the issue of morphological parallelism. Data such as in (143) shows that not all cases of category mismatch are permitted, even when the result would be semantically well-formed. In both examples below, the coordinated adverbs are of the same semantic type (both adverbs have the semantic type ($\langle\langle e\langle e,t\rangle\rangle,\langle e\langle e,t\rangle\rangle\rangle$).

(143) a. the once and future king

b. * the originally and future king

If the only condition on combination is semantic, then both of sentences above should be grammatical, but they are not. I hypothesize that in addition to semantic parallelism, there appears to be a morphophonological parallelism requirement. In *once and future king*, *once* does not have the morphological form of an adverb, and

this is what permits it to be conjoined with an adjective. Compare it to **originally and future king*, which is unacceptable.

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

(144) a. ? He always works [hard and thorough][5]

b. * He always works [carefully and thorough]

Facts from head coordination support my hypothesis. Müller (2013, 924) and Müller and Wechsler (2014, 26) claim that only heads that select the same number and type of complements can be conjoined. The evidence that they provide for this claim comes from German.

(145) (Müller and Wechsler 2014, 27, (24a,b,c))

a. Ich kenne und uterstütze diesen Mann.
I know and support this.Acc man

b. *Ich kenne und helfe diesen Mann
I know and help this.Acc man

c. *Ich kenne und helfe diesem Mann.
I know and support this.Dat man

The coordination in (145b-c) is impossible because the two conjoined verbs differ in the cases they assign to their objects: *kennen* assigns accusative, but *helfen* assigns dative. According to Müller and Wechsler, this shows that only heads that take the same number and type of complements can be combined.

However, Zaenen and Karttunen (1984) show on the basis of facts from Icelandic and French, that conjoining heads that differ in the case that they assign is possible if the case assigned is morphologically neutralized under accidental phonological identity. (See also Pullum and Zwicky 1986 and Bayer 1996.)

[5] Many people reject these. There is speaker variation in how readily people accept mismatches.

(146) (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 of barðaði köku.
he stole(Dat) and ate(Acc) cookie.Acc/Dat
'He stole and ate the cookie.'

The same is true for German. If the cases the conjoined heads assign are non-distinct, coordination is possible (Pullum and Zwicky 1986). Conjoining 'find' and 'help' is possible although the former assigns accusative while the latter assigns dative. In (147), Dative and Accusative cases are non-distinct on *Frauen*.[6]

(147) Er findet ud hilft Frauen
he finds(Acc) and helps(Dat) women.Dat/Acc
'He finds and helps women.' (Pullum and Zwicky 1986, 40)

Further support for the proposed morphophonological parallelism requirement comes from conjunctions of determiners. It is ungrammatical to conjoin a singular determiner with a plural determiner if they contrast morphologically. But if the noun they modify is morphologically neutralized like *sheep*, conjoining singular and plural determiners is allowed for some speakers.[7]

(148) a. * this and these cows

b. this and these sheep (Zaenen and Karttunen 1984, 311, (11))

The same facts hold of Modern Standard Arabic. The words *al-qawm* 'folk' and *an-nisaʔ* 'women' are plural but they are morphologically non-specified for plurality. Thus, a conjunction of a plural demonstrative and a singular one is compatible with these nouns.

[6] Judgments on similar cases are disputed. There appears to be considerable speaker variation. See Dalrymple and Kaplan (2000).

[7] There is speaker variation. Many people reject such examples.

(149) Modern Standard Arabic

a. haða wa haʔulaʔi al-qawm
this.M.SG and these.M.PL the-folk
'This and these folk'

b. haðih 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 (150), 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.

(150) Modern Standard Arabic

a. *haða wa haʔulaʔ al-rižal/al-ražul
this.M.SG and these.M.PL the-man.PL/the-man.SG
'This and these men/man'

b. *haðih wa ʔulaʔi al-fatay-at/al-fatah
this.F.SG and those.F.PL the-girl-F.PL/the-girl.F.SG
'This and those girls/girl'

Note that in the other well-formed examples of mismatching conjuncts above, morphology is not an issue: NPs and CPs do not contrast morphologically in English, nor do phrases in predicate position (NPs, PPs, APs).

On the basis of morphological combination facts summarized above, I formalize a combinatorial constraint, a Coordinate Semantic and Morphophonological Parallelism Constraint. The constraint states that conjuncts must be semantically and morphophonologically parallel, which I assume to hold of symmetric coordination.

(151) Coordinate Semantic and Morphological Parallelism Constraint

In [X coord Y] Z (order irrelevant), where Z is a functor shared by X and Y,

a. X and Y must be the same semantic type, and both X and Y must be compatibles with Z;

b. X, Y, and Z must all be morphologically compatible with the morphosyntactic features assigned between X and Z and Y and Z.

Now the question is: if a coordinate with mismatched categories is to be selected as an argument of some head, how are the selectional requirements of this head satisfied? Is there a way to resolve category mismatch? This will be the focus of the next section.

2.6 Selection in Coordination

It has long been known that selectional restrictions can be violated in coordination. Johannessen (1998) notes that in cases, such as (152), it is the first conjunct that must satisfy the selectional requirements of the selecting head. Traditional analyses argue that this selectional peculiarity is explained by assuming that the categorial features of the first conjunct percolate, via the coordinator, to the coordinate's topmost node which selection targets.

(152) a. You can depend on [[my assistant] and [that he will be on time]].

However, data that have not been considered before show that the last conjunct can also control selection. When the coordinate complex is the selector, it is the last conjunct that must be compatible with the selected dependent, as shown in the examples reproduced in (153).

(153) a. the [[once] and [future]] king

b. * the once king

c. the future king

Thus, it appears that what matters for selection is linear closeness between the selector and the dependent selected. In this section, I present an analysis which captures these linear effects of selection in syntax.

2.6.1 Data

Linear effects in selection in the context of coordination take two main forms. The first form is when a coordinate is selected by some head. The second form is when the coordinate complex selects some constituent. The typology of these two forms is shown in (154)-(155).

(154) a. X [YP & ZP]

b. [YP & ZP] X

(155) a. [X &Y] ZP

b. ZP [X & Y]

(English exhibits the patterns in (154a-b) and (155a). I expect that the pattern in (155b) occurs in a head final language, but for the purposes of the dissertation, I will limit the discussion to the English cases.)

The first case of linear effects in selection is when the coordinate complex is selected by a preceding head, as schematized in (154a), and exemplified in (152) above. An additional example is shown below.

(156) a. Pat was annoyed by [the children's noise] and [that their parents did nothing to stop it]. (Gazdar et al. 1985)

b. Pat was annoyed by [the children's noise].

c. * Pat was annoyed by [that their parents did nothing to stop the children's noise]. (Sag et al. 1985, 165, (124c), (125c); modified)

The second form is when the coordinate complex is selected by a following head that is only compatible with the last conjunct. For instance, in (157), *resulted in* cannot take a CP subject, but can take an NP subject. However, coordination of an NP and a CP can be the subject of this verb as long as the closer dependent is an NP.[8]

[8] Some speakers permit the sentential subject in the examples, such as in (157-159). Those speakers are irrelevant. There are speakers who agree with Pollard and Sag (1987) that a sentential subject is degraded, and at least some of those speakers find it improved in coordination.

(157) a. [That he was late all the time and his constant harassment of co-workers] resulted in his being dismissed.

b. * [That he was late all the time] resulted in his being dismissed. (based on Pollard and Sag (1987, 131))

c. His constant harassment of co-workers resulted in his being dismissed.

(158) 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. (Based on Alrenga (2005, 184, footnote 8))

(159) 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.

Consider (160). This is also an example of the pattern in (154b). Here the coordinate selects a following constituent. Note that only the conjunct closest to *king* must be compatible with it. *Once* is not even an adjective; it is an adverb (*he was once king* or *he was king once*). The example seems to be grammatical because only the coordinated head that is closest to the shared dependent needs to select that dependent. Here, *future* is a head, an adjective, that selects a nominal constituent.

(160) a. the once and future king

b. * the once king

One might think of the above example as a fixed expression. However, this does not seem to be the case. Other *fixed expressions,* if they are not grammatical in the current grammar, have explanations in terms like the following. They come

from an earlier stage of the grammar, where the phrase was grammatical (e.g., *What say you?*), or they come from things like stereotypical baby talk or second language speakers (*no can do*). No such explanation is possible for *the once and future king*. It is not a historical holdover; *the once king* was never grammatical for anyone; it is not baby talk or second language; it is not viewed as *marked* in any way by current native speakers. In addition, the pattern of *the Adv and Adj N* where *the Adv N* is ungrammatical is common, as shown in the examples below.

(161) a. ... in the once and future world ... [9] (*the once world)

b. The Once and Future Library [10] (*the once library)

(162) a. the twice and future caesar[11] (*the twice Caesar)

b. the twice and future president[12] (*the twice president)

c. the twice and future prime minister[13] (*the twice prime minister)

(163) a. ... that expression can be applied to [the thrice-and-future prime minister] of ...[14] (*the thrice prime minister)

b. ... [the thrice and undaunted Lady] ...[15] (*the thrice lady)

Some more examples of *the Adv and Adj* pattern are listed below. The frequency of these examples show that the pattern is productive.

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[9] https://books.google.com/books

[10] http://www.hermanmiller.com/research/research-summaries/the-once-and-future-library.html

[11] http://www.risingshadow.net/library/book/47397-the-twice-and-future-Caesar

[12] http://www.heritage.org/constitution/#!/amendments/22/essays/184/presidential-term-limit

[13] http://www.csmonitor.com/World/Asia-South-Central/2013/0512/The-twice-and-future-prime-minister-Nawaz-Sharif-garners-big-Pakistan-vote

[14] http://www.lobelog.com/too-clever-by-half-netanyahu-strengthens-obamas-hand/

[15] https://en.wikipedia.org/wiki/Teresia_Sampsonia

(164) *the soon and*

a. . . . cataclysmic events. . . were pointing to the soon and coming return of the Lord for His church. [16] (*the soon return)

b. The Soon and Coming King (YouTube video) [17](*the soon king)

(165) *the now and*

a. The Now and Future Kingdom[18] (book title), The Now and Future Caliphate[19], The now and future world of restricted work hours for surgeons[20] (*the now kingdom/caliphate/world)

b. the now and future winners[21], Hillary: The now and future democrat[22] (*the now winner/democrat)

The data seems to be real and to reflect a generalization about the synchronic grammar. However, the pattern is still restricted to cases where the adverb and the adjective do not contrast morphophonologically (that is, the adverb is not an *-ly* adverb). Morphophonological parallelism must be respected.

Another instance of linear effects in selection occurs in cases such as (166)-(167), where a shared dependent is compatible only with the last verb.

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[16] https://books.google.com/books?isbn=1602661790

[17] https://www.youtube.com/watch?v=mVj7D1Ic3D4

[18] http://www.americancatholic.org/Newsletters/JHP/aq0506.asp

[19] http://townhall.com/columnists/carterandress/2014/12/31/the-now-and-future-caliphate-n1937283/page/full

[20] http://www.ncbi.nlm.nih.gov/pubmed/12874571

[21] /http://mocoloco.com/a-design-awards-competition-the-now-and-future-winners/

[22] http://www.chicagotribune.com/news/opinion/commentary/ct-perspec-hillary-0916-20140915-story.html

(166) a. So the fox [thought about and decided] to carry the scorpion across the river,...[23]

b. So the fox decided to carry the scorpion across the river,...

c. *The fox thought about (to) carry the scorpion across the river.

(167) a. They [thought about and decided] to approach another Local Authority...[24]

b. *They thought about to approach another Local Authority

c. They decided to approach another Local Authority.

Thus, the data discussed in this section shows that peripheral conjuncts control selection; the closest to the constituent involved in selection is the crucial one. Since we know that selection must be accomplished in the syntax, the facts provide evidence that linear order can be put in the syntax, rather than PF, as argued by many for Closest Conjunct Agreement (See section 3.2).

2.6.2 Analysis

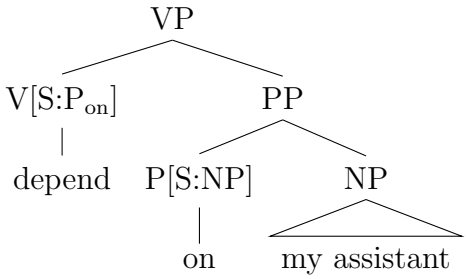
As pointed out in section 2.6, coordination allows mismatching categories, but symmetric coordination enforces a semantic parallelism constraint on the conjuncts so all conjuncts must be of the same semantic type. However, because a phrase that includes coordinated phrases must be incorporated into a larger syntactic structure, the topmost node must have a category label. Generally, its label will be that of one of the conjuncts. Thus, I propose that categories of the set label must be resolved just like phi features are resolved in nominal coordination. I propose that the resolution is based on the requirements of the surrounding syntax. The selectional requirements of the head that selects or that is selected by the coordinate as well as linear closeness is what determiners the label of the coordinate.

[23] http://www.killermovies.com/forums/archive/index.php/t-520314-did-obi-wan-forget-about-leia.html

[24] http://www.newleafadoption.co.uk/blog/an-a-adopters-journey-with-new-leaf-adoption

I hypothesize that coordination works as follows. First, syntactic derivations are built left-to-right (Philips 1996). Selectional properties are features of syntactic nodes, and they must be satisfied as soon as possible. I 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] (cf. Adger 2003). Verbs can also select for particular prepositions, which I notate with a subscript. In (168), *depend* has the selectional feature [S:P_{on}]. 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 VP merges with a projection of PP, the resulting object no longer has the feature [S:P_{on}]:

(168)



In turn, the P *on* has the selectional feature [S:NP], which is satisfied by merging with a category NP. The following principles govern when selectional features project:

(169) A selectional feature [S:X] on node Y projects to a dominating node Z unless

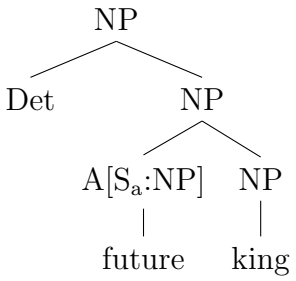
a. The daughters of Z are Y[S:X] and X, or

b. The daughters of Z are Y[S:X] and W[S:Y(S:X)].

(170) A selectional feature [S:Z] on node X projects to the next dominating node if its sister is Y[Sa:X(S:Z)].

As an example, an adjective selects a nominal constituent:

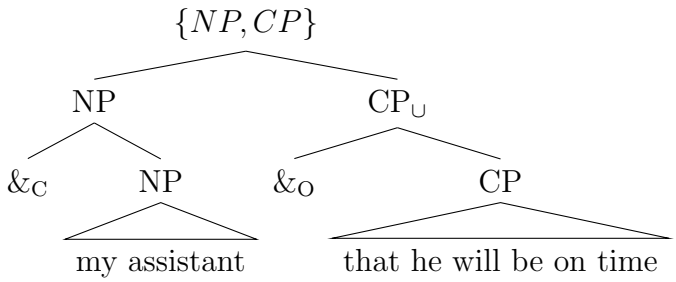
(171)



By merging with an NP, the selectional feature of A is satisfied. If the NP had selectional features, they would not be satisfied and would project. (I do not give any account here of determiners and what selects them or what they select.)

Since coordination does not care about syntactic category features, it will not assign any category to the coordinated phrase as a whole until it is forced to. Recall from section 2.1, the general schema of coordinate structure is diagrammed in (172), for *my assistant and that he will be on time*. In order for the label $\{NP, CP\}$ to be integrated into the surrounding syntax, the categories of the label must to be resolved, just like phi features.

(172)



As the syntax constructs the entire phrase, it will leave the coordinate set label as is until it is forced to assign it one of its members' labels. If nothing else forces

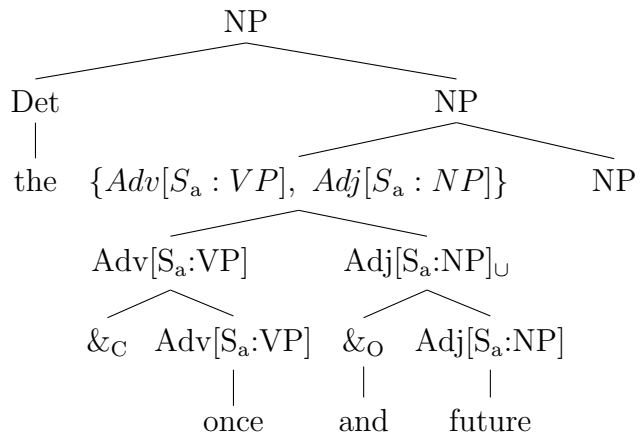
labeling, I assume that the set label will have to be labeled once the coordinated phrase is complete, because the phrase as a whole must be integrated into the surrounding syntax. In such a case, the label of the set will be the label of the most recently built conjunct (the last one).

Consider our mismatching Adv-Adj coordination again:

(173) the once and future king

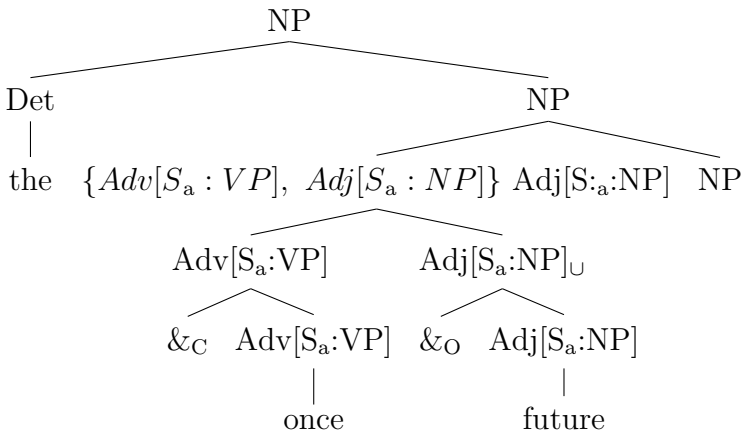
Since the coordinated phrase is an adjunct, there is nothing in the nominal that requires it. The syntax will build the conjunction as follows:

(174)



The topmost node labeled $\{Adv[S_{\text{a}} : VP],\ Adj[S_{\text{a}} : NP]\}$ 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.

(175)



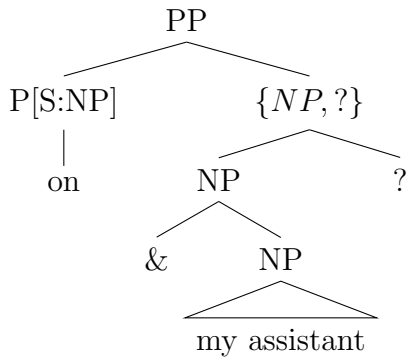
This satisfies all constraints, and the [Sa:N] feature is checked off. The [Sa:V] feature also did not project, so as far as the syntax is concerned, it was also checked off. The only thing that matters now is that the result be interpretable in the semantics. The adverb *once* just requires a predicate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

Consider now the following example:

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

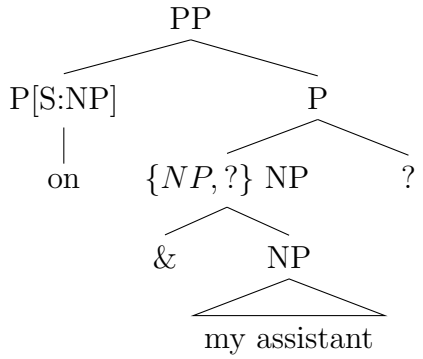
Here the preposition *on* has the label P[S:NP], with a selectional feature requiring a nominal constituent. The syntax therefore begins building such a constituent as its sister. Thus the first conjunct *my assistant* is merged first. The node of the combination of the preposition and the coordinate complex is not determined yet.

(177)



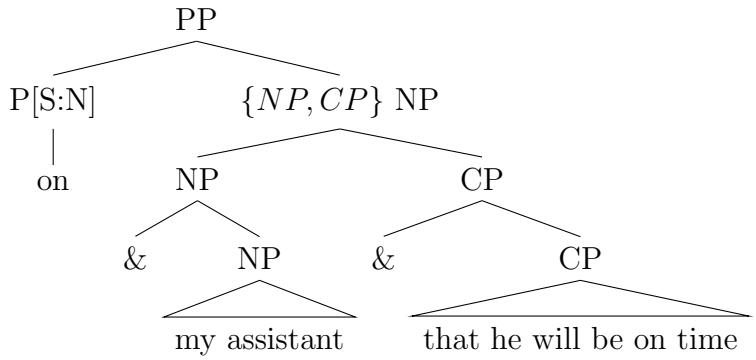
Since *my assistant* satisfies the requirement of *on* at this point category resolution applies, even before the rest of the coordinate is built. Thus, timing is a primary factor here. Note that the left to right derivation allows us to take advantage of intermediate steps.

(178)



The CP is then added:

(179)



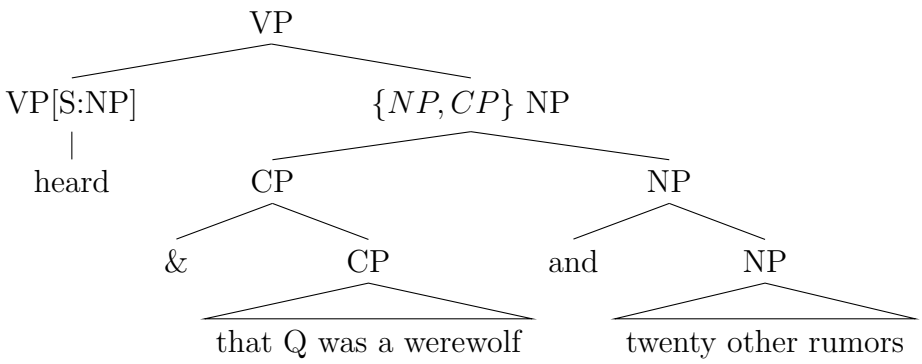
All syntactic constraints are satisfied. The CP needs to be the kind of semantic object that can combine with *depend on*. I assume that it denotes a fact, which is a type of individual that can be conjoined with an NP and is an appropriate semantic object for *depend on*. (Note that a CP can be the object of *depend on* if it moves, as in: *That he will be on time, you can depend on.*)

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

(180) 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 it is the most recently processed conjunct. When the entire subject phrase is put into its selected position, the selectional feature [S:NP] is satisfied. This example is a passive, so an unpronounced copy of the whole phrase will be merged into object position:

(181)

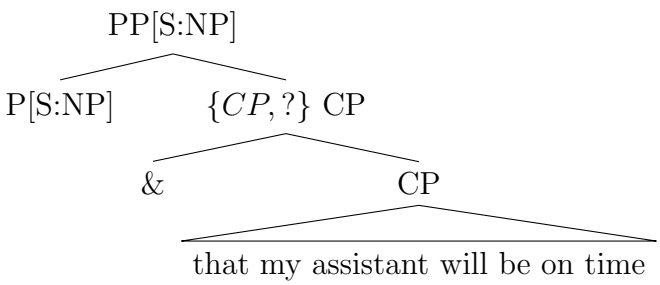


(Note that active *hear* permits CPs, but passive *was heard* seems not to. See Alrenga (2005) for some discussion of this phenomenon.)
Consider the ungarammatical example:

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

Once again *on* is P[S:NP]. 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 is CP, and the selectional feature on P will project to PP.

(183)



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

To wrap up this section, my 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. The new facts and the analysis proposed in this section contribute to the debate on where linear effects should be specified in the grammar. Selection provies evidence that linear order should be put in the syntax. In section 3.2, I argue that Closest Conjunct Agreement should also be valued in the syntax, contra Benmamoun et al. (2009) and Bhatt and Walkow (2013), among others.

2.7 Symmetric and Asymmetric Coordination

In this section, I will discuss the differences between symmetrical and asymmetrical coordination. This distinction is crucial for two reasons. First, it appears that symmetrical coordination allows only similar semantic types, while asymmetrical coordination allows mismatched semantic types provided that they do not violate general well-formedness constraints. This helps identify the sort of restrictions on what constituents may be coordinated and what constituents may not. The distinction also helps identify the contexts in which these constraints apply. The second reason is

related to extraction. It has been noted that extraction of an element from a symmetrical coordination is only possible if it applies across-the-board (ATB), whereas extraction from asymmetrical coordination is unrestricted (Munn 1993; Bošković and Franks 2000; Zhang 2010a; Salzmann 2012).

2.7.1 General Differences

The terms symmetric and asymmetric were traditionally used to make a distinction between true coordination in which the function of the coordinator is more like group formation and coordination that is similar to subordination. In (184), *and* functions as a group forming coordinator, while the meaning conveyed by *and* in (185) is causation.

(184) [A man and woman] who dated met in the park. (Link 1983)

(185) That's the stuff that the guys in the Caucasus drink and live to be a hundred. (Lakoff 1986, attributed to Farley)

Symmetrical coordination can have a joint reading or a split reading (Heycock and Zamparelli 2005). The joint reading is also referred to as intersective. The intersective reading is when the result of coordination is an intersection of the properties described by the conjuncts. For instance in (186a), a person who cannot be trusted is the person who is both a liar and a cheat. The meaning of the coordinate is the intersection of the meaning of *liar* and *cheat* (186b).

(186) (Champollion 2015, 1, (1b))

a. [A liar and cheat] cannot be trusted.

b. [[liar and cheat]] = [[liar]] ∩ [[cheat]] = λx. x is liar and x is a cheat

Similarly, in (187), the coordinate complex contains two nouns, but the whole coordinate is an intersection of the properties of being a friend and being a colleague.

(187) [A friend and colleague] is coming over.

However, the joint reading appears not to be related to the coordinator itself or to the structure of the coordinates since we can see the same facts with plurals. A plural noun may function as a singular or as a plural. In (188), *the sex lives of Roman Catholic nuns* functions as a singular although it is semantically plural. So we can say that the plural represents a set and this set is construed as singular in this case.

(188) [The sex lives of Roman Catholic nuns] does not, at first blush, seem like promising material for a book. (Newsweek, April 22, 1985:71, cited by Reid (2011))

The split reading in symmetrical coordination is, on the other hand, when the coordination is plural. In (189), *John and Mary* do not intersect, rather they form a group.

(189) (Champollion 2015, 1, (2b))

a. John and Mary met in the park last night.

b. A man and woman met in the part last night.

A clearer example of the split reading is (190). The split agreement on the auxiliary shows that the coordination here is plural.

(190) [A friend and a colleague] are coming over.

In some cases, a symmetric coordinate can be ambiguous between an intersective reading or a split reading (Heycock and Zamparelli 2005; Champollion 2015). *every linguist and philosopher* can mean *every x such that x is a linguist and x is a philosopher* (191a), or it can mean *every x and every y such that x is a linguist and y is a philosopher* (191b).

(191) [Every linguist and philosopher] knows the Gödel Theorem.

a. Everyone who is both a linguist and a philosopher knows the Gödel Theorem.

b. Every linguist knows the Gödel Theorem, and every philosopher knows the Gödel Theorem (Champollion 2015, 2, (5)).

Asymmetrical coordination, on the other hand, does not seem to allow a split reading, nor does it show an intersective reading. Rather, the conjuncts are linked to each other by some logical relation such as temporal precedence, causation, or conditional relations, among others. Weisser (2015) categorizes asymmetric coordination into consecutive coordination, scene-setting coordination, and conditional coordination. In consecutive coordination, the event described in a non-initial conjunct is a consequence of the event described in a preceding conjunct (Weisser 2015, (17)). Consecutive coordination subsumes causatives and temporal precedence.

(192) Consecutive Coordination

a. That's the stuff the guys in the Caucasus drink and live to be a hundred. (Lakoff 1986, 157)

b. That's the kind of of firecracker that I set off and scared the neighbors. (Lakoff 1986, 157)

c. I dialed 911 and an ambulance arrived. (Chaves 2012b, 769, (13a))

d. He jumped on his horse and rode off into the sunset. (Chaves 2012b, 769, (13b))

In scene-setting coordination, a conjunct gives a locational or temporal background for the event described in a following conjunct.

(193) Scene-Setting Coordination

a. Here's the whiskey that John went to the store and bought. (Ross 1967, 168)

b. Who did he pick up the phone and call? (Lakoff 1986, 156)

c. Sam is not the kind of guy you can just sit there and listen to.(Lakoff 1986, 153)

d. Who did John go to town and pump water for? (De Vos 2005, 24)

Conditional coordination is when the first conjunct functions as a condition of the second conjunct.

(194) Conditional

a. You know, of course, that you drink one more beer and you get kicked out. (Culicover and Jackendoff 1997, 198)

b. Another picture of himself appears in the newspaper and John will definitely go out and get a lawyer. (Culicover and Jackendoff 1997, 202)

In addition to the semantic differences between symmetric and asymmetric coordinates, there are syntactic differences in reversibility, categories involved and extraction restrictions. Symmetric conjuncts are reversible while asymmetric conjuncts are not (Chaves 2012b; Weisser 2013, 2015). In asymmetric coordination, reversing the conjuncts will result in unacceptability or ungrammaticality or a different meaning. Reversing the conjuncts changes the meaning drastically. In (195a), the first conjunct is a condition of the second conjunct, but in (195b) the meaning appears like the second conjunct is a result of the first.

(195) a. You give him_{i} enough opportunity and every $\text{senator}_{\text{i}}$, no matter how honest, will succumb to corruption. (Culicover and Jackendoff 1997, 204)

b. #Every $\text{senator}_{\text{i}}$, no matter how honest, will succumb to corruption and you give him_{i} enough opportunity.

Note that in symmetric coordination, reversing conjuncts do not change the meaning or affect the grammaticality of the sentence.

(196) a. The government will discuss the budget and increase gas rates this month.

b. The government will increase gas rates and discuss the budget this month.

Furthermore, the categories involved in each kind of coordination are different. While symmetrical coordination involves any categories, asymmetrical coordination involves only verbal or clausal conjuncts.

(197) Symmetrical

a. [John] and [Mary] are coming. NP&NP

b. [[in London] and [in Berlin]], it is still cold. PP&PP

c. I don't know if [[Mary left] and [Peter returned.]] IP&IP (Wilder 1994, 293, (10))

(198) Asymmetrical

a. This is the thief that [you just pointed out and we arrested on the spot] (Weisser 2013, 303, (4)). IP&IP

b. What did he [go to the store, buy, load in his car, drive home and unload]? (Lakoff 1986, 153) VP&VP

Additionally, symmetric and asymmetric coordination exhibit differences in extraction. Ross (1967) proposes that the Coordinate Structure Constraint (CSC), a constraint that defines the restrictions on extraction out of coordinates. One part of the CSC is called the element constraint, which bans extracting an element from a coordinate (Grosu 1973). It turns out that this constraint can be violated in many contexts. In symmetric coordination element extraction is possible only if it takes place across-the-board as in (199).

(199) a. *What$_{i}$ did John buy t_{i} and read the magazine? (Kehler 2002, (2))

b. What$_{i}$ did John buy t_{i} and read t_{i}?

In asymmetric coordination, element extraction may be asymmetric as well as across-the-board as in (200).

(200) a. Who$_{i}$ did John [call the police and report that someone attacked t_{i}]?

b. What$_{i}$ was the book [you read t_{i} , and stayed up all night?]

c. What$_{i}$ is the book that [you read $t_{i}$and wrote a review about t_{i} in one week]?

So, symmetric coordination involves a coordinator that gives rise to split as well as joint readings, while asymmetrical coordination involves a coordinator which may have a wide range of semantic functions including temporality, causation and conditionality. They are also different in reversibility and extraction. In asymmetrical coordination, conjuncts are irreversible and asymmetrical extraction is possible. In symmetrical coordination, conjuncts are reversible and asymmetrical extraction is impossible.

2.7.2 Asymmetrical Coordination and Subordination

Now I will discuss a view that has been adopted by many, namely that asymmetric coordination is similar to subordination (Ross 1967 and many others). Asymmetric coordination has been thought to have a structure similar to subordination, with the first conjunct being an adjunct to the rest of the coordinate, or vice versa. The correlation between asymmetric coordination and subordination is due to the similarities in meaning and function between subordination and asymmetric coordination. In the sentences below the a-sentences, which are asymmetric coordinates, convey a meaning that is conveyed by the b-sentences which involve subordinate clauses.

(201) a. Peter went to the bookstore and bought the new bestseller.

b. After Peter went to the bookstore, he bought the new bestseller. (Weisser 2015, 33, (13a))

(202) a. Bring up this topic again, and I am leaving.

b. If you bring up this topic again, I will leave.

Chaves (2012b) summarizes a number of arguments that have been advanced against the subordination analysis. The first argument is related to the difference in meaning. Subordinate structures are not synonymous with asymmetric coordination. In (203a), the meaning conveyed by the purpose non-finite clause can be contradicted or canceled by adding the clause *but the sales ... instead.* However with asymmetrical

coordination adding an adversative coordinate to cancel the meaning of the asymmetrical conjunct is not possible (203b).

(203) a. I went to the store to buy some green tea, but the sales clerk persuaded me to buy hot chocolate instead.

b. * I went to the store and bought some green tea, but the sales clerk persuaded me to buy hot chocolate instead. (adapted from Chaves (2012b, 470, (14))

However, analyzing coordination as subordination does not require that every *and* sentence have a synonymous subordinate clause sentence. *And* can mean something different from *to*.

In addition, Lakoff (1986) remarks that asymmetric coordination can iterate with no upper limit on the number of conjuncts.

(204) a. How many kinds of tequila has he [snuck off to Mexico, sampled , and come back the same day without telling anyone]?

b. Concerts that short, you can leave work early, hear the entirety of, and still be back at the job before anyone notices you are gone (Chaves 2012b, 470, (15)).

In contrast, subordinates do not iterate:

(205) A Pennsylvania woman died because she had a deadly crash *(because she lost control of her car).

Note that (205) can be acceptable but only when the second clause modifies the first.

Furthermore, an obvious difference between asymmetric coordination and subordination is the immobility of conjuncts in contrast with a subordinate clause which may freely move (Levine 2001; Kehler 2002).

(206) a. Sally received a post-doctoral fellowship right after she graduated.

b. Right after she graduated, Sally received a post-doctoral fellowship.

(207) a. We can expect our graduate students to teach one course and still finish a dissertation on time.

b. *And still finish a dissertation on time, we can expect our graduate students to teach one course. (Chaves 2012b, 470, (16))

Therefore, we cannot just say that asymmetric coordination involves subordination. First, asymmetric coordination involves the same set of coordinators.

(208) *or*

a. Sue will graduate [in the summer or in the fall]. (symmetrical)

b. [The state should stop its nuclear program, or further sanctions will be imposed]. (asymmetrical)

(209) *but*

a. Ted reads [all sorts of literary genres but poems]. (symmetrical)

b. [The country would accept more refugees, but no organization has offered to help yet]. (asymmetrical)

Second, asymmetric coordination obeys the conjunct constraint. A conjunct may not be displaced from asymmetric coordination in the same way it cannot from symmetric coordination (210). In (211a), VP topicalization of the second VP adjunct is impossible.

(210) *Who did you see [_ and Tim]? (Chaves 2012b, 469, (7a))

(211) a. Peter went to the bookstore and bought the new bestseller.

b. * Bought the new bestseller, Peter [went to the store and _].

Therefore, there is no reason to treat asymmetric coordination as subordination. Asymmetric coordination is similar to symmetric coordination in many ways, and is distinct from subordination in many aspects.

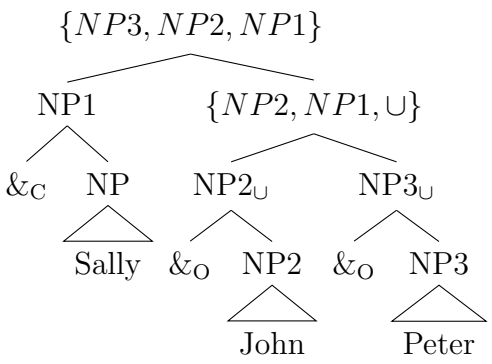
2.7.3 Derivation of Asymmetric Coordination

Now I turn to the issue of structure. I propose that asymmetric coordination is derived in the same way symmetric coordination is derived. As I have shown in section 2.1 for symmetric coordination, a coordinator triggers a union operation, which results in a set label. I assume that in symmetric coordination, the set label is not an ordered set. The derivation of symmetric coordination as in (212) is shown in (213).

(212) a. Mary has invited Sally, John and Peter to dinner tonight.

b. [Sally, John and Peter]
$= \{Sally, John, Peter\}$

(213)

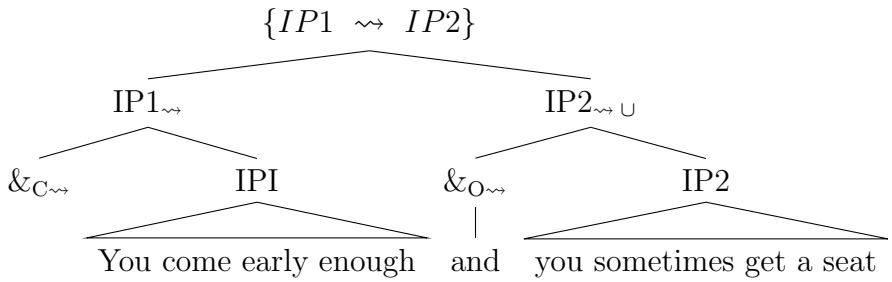


On the other hand, I propose that the label of an asymmetric coordinate should be different. Since the semantic relation between the conjuncts in asymmetrical coordination is causation, temporal precedence or a conditional, the set created by the combination of conjuncts is an unordered list of conjuncts. I propose that the set generated in this case involves a special relation, I will call it *leads to* and use a zigzagged right arrow to notate it on the coordinator as $\&_{\rightsquigarrow}$. So x $\rightsquigarrow$ y means 'x leads to y'. I assume that *leads to* can be quite general. It can mean purpose, causation, temprality or conditionality. I will still assume that $\&_{\rightsquigarrow}$ can be an open coordinator, $\&_{O\rightsquigarrow}$ or a closed coordinator $\&_{C\rightsquigarrow}$. I also still assume that the open coordinator, $\&_{O\rightsquigarrow}$, endows its

complement with a union feature. So, the only difference is that it creates an ordered rather than an unordered set.

Consider example (214). The derivation proceeds from left to right by merging the closed coordinator, $\&_{C\rightsquigarrow}$ with *You come early enough.* The resulting projection has the same category as the conjunct, but I notate it with $\rightsquigarrow$ to show that this conjunct will hold a *leads to* relation to subsequent conjuncts. The open coordinator, $\&_{O\rightsquigarrow}$, combines with *you sometimes get a seat* and is labeled as IP2$_{\rightsquigarrow \cup}$. The result of merging IP1$_{\rightsquigarrow \cup}$ with IP2$_{\rightsquigarrow}$ is $\{IP1 \rightsquigarrow IP2\}$.

(214) You come early enough, and you sometimes get a seat. (Keshet 2013, 242)

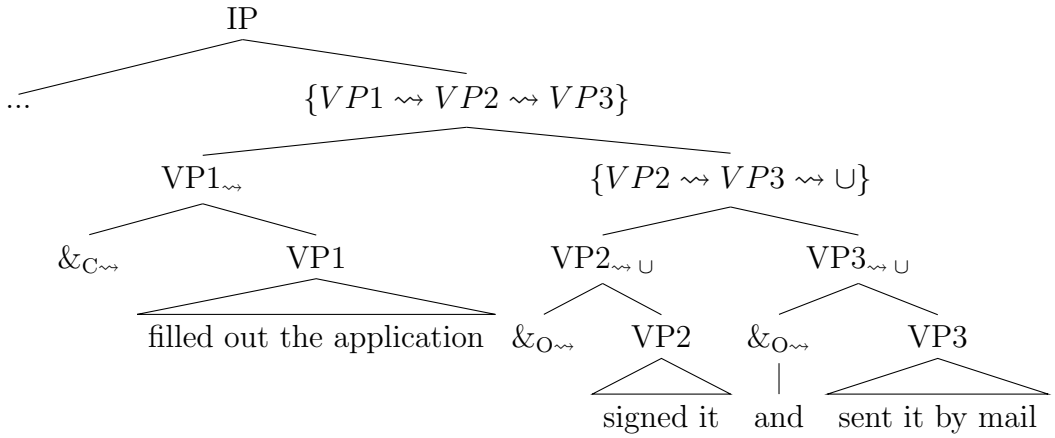


Now consider the example below, which involves temporal sequencing of conjuncts.

(215) Mary filled out the visa application, signed it, and sent it by mail.

The derivation runs from left to right, ignoring the derivation of the whole IP and focusing only on the derivation of the coordinate. A closed coordinator $\&_{C\rightsquigarrow}$ combines with *filled out the visa application* and creates a VP1$_{\rightsquigarrow}$. An empty set node is projected. In a different workspace, $\&_{O\rightsquigarrow}$ combines with *signed it* and creates a projection VP2 $_{\rightsquigarrow \cup}$. Then, $\&_{O\rightsquigarrow}$ merges with *sent it by mail* and creates a projection VP3 $_{\rightsquigarrow \cup}$. VP2 $_{\rightsquigarrow \cup}$ and VP3 $_{\rightsquigarrow \cup}$ merge, and the merger is labeled as $\{VP2 \rightsquigarrow VP3, \cup\}$. The set $\{VP2 \rightsquigarrow VP3, \cup\}$ merges with VP1$_{\rightsquigarrow}$ in the main workspace, and the merger is labeled $\{VP2 \rightsquigarrow VP3, VP3\}$.

(216)



I have pointed out earlier that asymmetrical coordination does not involve nominals. Now *leads to* explains why. Asymmetrical coordination does not involve nominals because a nominal cannot 'lead to' another nominal. In symmetrical coordination a first person can be combined with a third person via union relation (1∪ 3). This is impossible in asymmetrical coordination because a first person does not 'lead to' a third person (*1⇝ 3).

To summarize, I have discussed semantic and structural differences between symmetrical and asymmetrical coordination. Symmetrical coordination involves creation of sets in which members appear to have equal status, while asymmetrical coordination involves creation of sets whose members involve a logical relationship. In each type, it is the type of coordinator that controls the meaning and the derivation of the coordinate structure.

2.8 Summary

In this chapter, I have discussed various topics that pertain to coordinate structure. I argued that coordinate structure is special in requiring Set Label, an operation that assigns a label that takes the form of a set that contains the labels of the conjuncts. I motivated Set Label from facts about agreement resolution. One goal of the chapter is to show that the configuration between conjuncts is irrelevant to binding

and selection, which turn out to be linear phenomena. In fact, all structures that have been proposed in the literature are compatible with the facts about binding and selection. The facts about selection and binding presented in the chapter contribute to the debate on where linear order should be specified in the grammar. The facts argue for putting linear order in the syntax.

Chapter 3

ISSUES IN AGREEMENT

In this chapter I will discuss issues of agreement in the context of coordination. In section 3.1, I will discuss resolved agreement. Resolved agreement occurs when the phi-features of the coordinate complex are computed from the phi-features of its conjuncts. The rest of the chapter is devoted to discussing the second form of agreement, closest conjunct agreement (CCA, due to Benmamoun et al. 2009). CCA occurs when a peripheral conjunct values agreement. The main goal of this chapter is to show that CCA is a linear phenomenon and to propose an analysis that captures linear effects in the syntax, contra previous accounts which attempted to derive linear effects by claiming that valuation of conjunct agreement is split between narrow syntax and PF (Benmamoun et al. 2009, Bhatt and Walkow 2013; Marušič et al. 2007; van Koppen 2008).

3.1 Coordinate Feature Resolution

In this section, I will discuss how agreement resolution features are computed. I will adopt Dalrymple and Kaplan (2000) feature set union algorithm and show how it accounts for agreement feature resolution facts. As I have indicated in section 2.1, agreement resolution is one motivation for the analysis of structure derivation as a union of conjuncts.

Resolution is a process though which the features of the coordinate phrase are derived from the person, number and gender features of the coordination of individual conjuncts (Munn 1993; Johannessen 1998; Dalrymple and Kaplan 2000; Corbett 2006). I will start the discussion with person resolution. Person features are resolved following a cross-linguistic pattern. In a combination of different PERSON values, if one conjunct

is 1PERSON, the resolution must be 1PERSON. And if 2PERSON combines with 3PERSON in absence of 1PERSON, the resolution must be 2PERSON. For instance, in (217a) in which one conjunct is first person and the other is third person, the agreement on *priš-l-a* 'arrive' is first person. On the other hand, in (217b) in which one conjunct is second person while the other two conjuncts are third person, the resolved feature on the auxiliary verb *ste* is second person. (I should note that it seems that agreement in Slovene spreads across the auxiliary and the verb. However, not all features spread. Person agreement appears on the auxiliary but not the main verb.)

(217) Slovene

a. [Jaz in Tone] sva priš-l-a
1SG and Tone.M AUX.1DU arrive-PST-M.DU
'I and Tone have arrived.' (Priestly 1993, 433-434)

b. [Ti, Tone in Tomo] ste priš-l-i
2SG Tone.M and Tomo.M AUX.2PL arrive-PST-M.PL
'You, Tone and Tomo have arrive.' (Corbett 2006, 240, (5))

Similar facts are observed in Arabic. The reader can check for herself the agreement patterns in the examples in (218) which also show that first person resolution has priority over second person, and second person has priority over third person.

(218) Modern Standard Arabic

a. [ʔana w ʔanta] sa-na-ðhabu ʔila as-suuq ɣadan
I and you FUT-1PL-go.M.PL to the-market tomorrow
'Me and you will go shopping tomorrow.'

b. [ʔana w Ali] sa-na-ðhabu ʔila as-suuq ɣadan
I and Ali FUT-1PL-go to the-market tomorrow
'Me and Ali will go shopping tomorrow.'

c. [ʔanta w Ali] sa-ta-ðhabun ʔila as-suuq ɣadan
I and you FUT-2PL-go to the-market tomorrow
'You and Ali will go shopping tomorrow.'

d. *[ʔana w ʔanta] sa-ta-ðhabun ʔila as-suuq ɣadan
I and you FUT-2PL-go-M.PL to the-market tomorrow
'Me and you will go shopping tomorrow.'

To capture this pattern, Zwicky (1977) proposes the hierarchy in (219) which is a ranking of person feature values. This hierarchy has been assumed in many subsequent works on agreement resolution including Corbett(1983, 2006), Dalrymple and Kaplan (2000), Wechsler and Zlatić (2003), among others.

(219) 1>2>3

On the basis of this hierarchy, Dalrymple and Kaplan (2000) represent the resolution facts using sets. In particular, they propose that resolution is a union operation. For person resolution, a conjunct's person value is a set that can have a speaker value (S) or a hearer value (H), or no value. Speaker value corresponds to first person, hearer value corresponds to second person, and the empty set is third person. [1]

(220) (Dalrymple and Kaplan 2000, 780; modified)

a. $\{S\}$: first person

b. $\{H\}$: second person

c. $\{\}$: third person

When nouns with similar or different person values combine, a resolution of person is required. Dlarymple and Kaplan propose that resolution is a union operation of the sets. To illustrate how person resolution applies, I will discuss person resolution in Fula from Dalrymple and Kaplan. In this language, there are two sorts of first person: inclusive and exclusive. Consider the examples below. The person resolution on the verb follows Zwicky's hierarchy.

(221) Fula (Dalrymple and Kaplan 2000, 781-782, (81)-(86))

a. an e Bill kö Afriki djodu-don.
you and Bill in Afrika live.2
'You and Bill, you live in Africa.'

[1] I should note that Nevins (2007) makes a strong case against treating 3rd person as unvalued. If Nevins is correct, then Dalrymple and Kaplan's algorithm will have to be reformulated.

b. Bill e George kö Afriki be-djodi.
Bill and George in Afrika live.3
'Bill and George, they live in Africa.'

c. an e min kö Afriki djodu-dèn.
you and I in Afrika live.1.INCL
'You and I, we live in Africa.'

d. an e Bill e min kö Afriki djodu-dèn.
you and Bill and I in Afrika live.1INC
'You and Bill and I, we live in Africa.'

e. Bill e min kö Afriki mèn-djodi.
Bill and I in Afrika live.1EXCL
'Bill and I, we live in Africa.'

f. Bill e mènèn kö Afriki mèn-djodi.
Bill and we-EXCL in Afrika live.1EXCL
'Bill and us, we live in Africa.'

Dalrymple and Kaplan show person resolution in Fula as sets (222). Note that first person inclusive corresponds to a set of two members: the speaker (S) and the hearer (H), while the first person exclusive includes only the speaker (S).

(222) Fula Person Resolution via Set: (Dalrymple and Kaplan 2000, 783: (88))

a. $\{S\}$ (1SG) $\cup$ $\{H\}$ (2) = $\{S, H\}$ (1INC.PL)

b. $\{S\}$ (1SG) $\cup$ $\{H\}$ (2) $\cup$ $\{\}$ (3) = $\{S, H\}$ (IINC.PL)

c. $\{S\}$ (1SG) $\cup$ $\{\}$ (3) = $\{S\}$ (1EXC.PL)

d. $\{S\}$ (IEXC.PLU) $\{\}$ (3) = $\{S\}$ (1EXC.PL)

e. $\{H\}$ (2) $\cup$ $\{\}$ (3) = $\{H\}$ (2)

f. $\{\}$ (3)$\cup$ $\{\}$ (3)= $\{\}$ (3)

Dalrymple and Kaplan propose that in languages such as English, the three possible person combinations as in (223). I will not discuss the merits of this proposal. For a detailed discussion, I refer the reader to Dalrymple and Kaplan's (2000) own work (section 6.2).

(223) (Dalrymple and Kaplan 2000, 780)

a. $\{S, H\}$: first person nonsingular

b. $\{H\}$: second person

c. $\{\}$: third person

I will adopt this featural set combination in my analysis. To illustrate how the analysis explains resolution in examples (218a-c), the union is represented in (224) respectively. Modern Standard Arabic lacks inclusive/exclusive distinction.

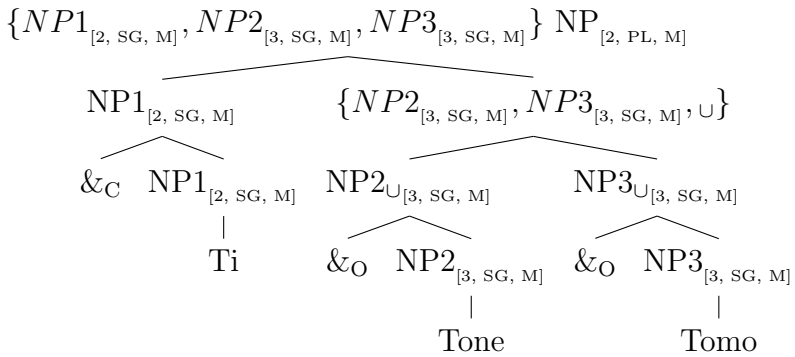
(224) a. $\{$ ʔana $\} \cup \{$ ʔanta $\} = \{S\} \cup \{H\} = \{S, H\} = 1\text{PERS}$

b. $\{$ ʔana $\} \cup \{Ali\} = \{S\} \cup \{\ \} = \{S\} = 1\text{PERS}$

c. $\{$ ʔanta $\} \cup \{Ali\} = \{H\} \cup \{\ \} = \{H\} = 2\text{PERS}$

Recall that on the basis of the resolution via set union, which appears to capture facts about phi feature resolution of a coordinate complex, I proposed that the derivation on the coordinate structure also proceeds via union of the conjuncts. Thus, I adopt this analysis for the coordinate set node and assume that resolution applies as a part of the structure building. In (225) for (217b), the person resolution algorithm scans the conjunction set $\{Ti, Tone, Tomo\}$ and performs a union algorithm on the person features of the conjuncts which results in a resolved feature [2 person]. The result of agreement resolution is copied to resolved category of the coordinate set, represented outside the curly brackets on the topmost node.

(225)



Now I turn to number resolution. In a language like English which distinguishes two numbers, singular and plural, resolution of number will always be plural. However, in languages that distinguish dual number, if the coordinate phrase contains two conjuncts, and these conjuncts happen to be singulars, then the number is resolved as dual. If the number of members of the conjunction is greater than 2, number is resolved as plural. This is the case in Slovene. In (226a), the coordinate contains two singulars and the agreement on the verb is dual, while in (226b) a singular and a dual conjunct occur in the coordinate and the agreement is plural.

(226) Slovene:

a. [Jaz in Tone] sva priš-l-a
1SG and Tone.M AUX.1DU arrive-PST-M.DU
'I and Tone have arrived.' (Priestly 1993, 433-434)

b. [Dv-e telet-i in en-o žrebe] so bi-l-i
two-N calf(N)-DU and one-N-SG foal(N)[SG] AUX.3PL be-PST-M.PL
zunaj
outside
'Two calves and a foal were outside.' (Priestly 1993, 433)

Dalrymple and Kaplan 2000 do not show number resolution via set union. However, one way to represent number resolution is via computing the absolute value of the union of the conjuncts' numbers. Here 'union' and 'sum' are the same for number resolution. So, number is resolved via computing the sum of the absolute values of conjuncts. In languages that have dual, if the sum of the absolute values is 2, then resolution is dual; if > 2, it is plural. To illustrate the analysis, in (227), the algorithm scans the conjunction label set for number features. The result is dual as in (228).

(227) Slovene

Milk-a in njen-a mačka sta bi-l-i zunaj.
Milka.F-SG and her-F.SG cat.F-SG be.DU be-PST-F.DU outside

'Milka and her cat were outside.' (Priestly 1993, 433)

(228)

$$\text{Conjunction label}=\{[_{\text{NP}} Milk - a_{[\text{SG}]}], [_{\text{NP}} njen - amačka_{[\text{SG}]}]\}_{\ [\text{DUAL}]}$$

$$\downarrow \text{ Number Resolution}$$

$$|\{SG \cup SG\}|= 2=\text{DUAL}$$

Moving to gender resolution, gender agreement follows a general pattern across languages. When conjuncts of the same gender combine, the resolved gender is the gender they share. This is the case in most languages as shown below for Slovene, Modern Standard Arabic, and Croatian.

(229) Slovene

Marin-a Mart-a in Marjanc-a so prizadevn-e
Marina.F-SG Marta.F-SG and Marjanca.F-SG cop.3PL assiduous-F.PL

'Marina, Marta and Marjanca are assiduous.' (Lanček 1972: 61)

(230) Modern Standard Arabic

Al-talib-ah w al-muʕalim-ah sharaka-ta fi-l-muʔtamar
the-student-F.SG and the-teacher-F.SG participate-F.DU in-the-conference

'The student and the teacher participated in the conference.'

(231) Croatian

... ta sećanja i razmatranja sve su više ustupala(N.PL)
those memories.N.PL and reflections.N.PL ever have more yielded.N.PL
mesto novim uttscima ...
place to-new impressions ...

'those memories and reflections increasingly gave way to new impressions.' (Corbett 1983, 188, (37))

If conjuncts mismatch in gender, generally, languages resolve agreement as follows. A masculine and a feminine or a masculine and a neuter yield masculine gender. For instance, in Hindi when masculine and feminine combine, the resolved gender is masculine. This is also the case in Modern Standard Arabic.

(232) Hindi

meraa kuttaa aur merii billii mere saath g^{h}ar mẽ rahte hã i
my dog.M and my cat.F with me house LOC live.M

'My dog and my cat live with me in the house.' (Dalrymple and Kaplan 2000, 788, (107))

(233) Modern Standard Arabic

Ali w Muna xaraj-aa fi nuzhah
Ali.M and Muna.F go.out.M.DU in a.picnic

'Ali and Muna went on a picnic.'

Conjoining a feminine with neuter yields feminine:

(234) Slovene

T-a streh-a in gnezd-o na njej mi
that-F.SG roof.F-SG and nest.N-SG on 3SG.F.LOC 1SG.DAT
bosta ostal-a v spomin-u
wux.FUT.3DU Remain-M.DU in memory-SG.LOC

'That roof and the nest on it will remain in my mind.' (Lančekk 1972: 60)

Therefore, languages also seem to have a gender hierarchy:

(235) MASC > FEM > NEUT

To account for the above generalizations, I will also assume that gender features resolve via union. I show how resolution works in two-conjunct NPs in (236) -(237). Note that the union of FEM and MASC, $\{M, F\}$ gives MASC. It seems that there is an intrinsic ordering between the two genders.

(236) a. Masculine = $\{M\}$ or $\{M, F\}$

b. Feminine = $\{F\}$

c. Neuter = { }

(237) a. {F}∪{M}={ F, M} = [M]

b. {M}∪{}(*neuter*) ={ M} = [M]

c. {F}∪{}(*neuter*) ={ F} =[F]

I should note that there are other idiosyncrasies with gender resolution. For a detailed discussion of gender resolution, see Corbett (1991, 2006).

Another issue that might be relevant to resolution is Case. The general assumption is that Case is not an intrinsic feature of a noun. It gets it from a head that licensed the noun by checking unvalued Case features. I follow Johannessen (1998), Schütze (2001), and Walkow (2013) in assuming that Case undergoes spreading. Case spreads to the coordinates via the coordinate topmost node. This is how coordinates are comply with the Case filter (Schütze 2001).

To recapitulate, following Dalrymple and Kaplan's analysis of resolution, I have shown how resolution of all phi-features can be computed by set union. The union algorithm is one of the motivations for the coordinate structure derivation via conjunct union proposed in chapter 2. The resolution algorithm is triggered by the merge of the coordinator into the derivation and activated throughout the derivation of the conjunction phrase. In section 2.6, I proposed that the coordinate complex's label requires category resolution in order for it to be integrated in the surrounding syntax. I propose that the resolved features that result from the algorithms proposed above are copied to this resolved category label. The resolved label as well as the resolved features copied to it is what will be visible to outside elements. See the schema of resolution below.

(238) $\{YP, ZP, ...\}$ XP (resolution) $\rightarrow$ $\{YP, ZP, ...\}$ $\text{XP}_{[\alpha\text{P}, \beta\text{N}, \gamma\text{G}]}$

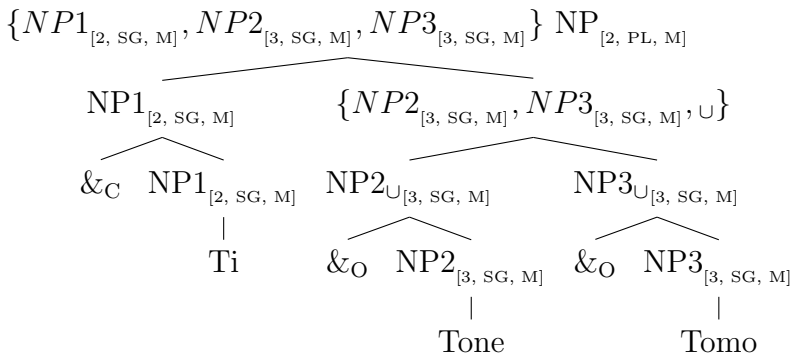
Consider example (217b) again, reproduced below. I will show in more detail how resolution applies here.

(239) Slovene

Ti, Tone in Tomo ste priš-l-i
2SG Tone.M and Tomo.M AUX.2PL arrive-PST-M.PL
'You, Tone and Tomo have arrive.'

First, the coordinate set is built in the same way I have shown in section 2.1 via conjunction union. Each conjunct has its phi features as a feature matrix. The set node will have a feature matrix that encodes all the features of the conjuncts. Since the coordinate is the subject and precedes the verb , category resolution does not apply before the coordinate is fully built. Phi feature resolution is computed. Computation of resolved agreement can apply either after the coordinate is fully built or on-line. Here all conjuncts are masculine, so gender is resolved as masculine. The set involves a combination of second person and third person, so, according to the person hierarchy, the resolved person is second person. As for number resolution, the sum of the absolute values of the conjuncts is more than one and it does not equal 2, so singular and dual agreement are excluded. Therefore, resolved number is plural. The feature matrix of the resolved number is tagged to the resolved category of the coordinate complex. The result of category resolution is NP. At this point the result of applying the union algorithm to the individual conjuncts is copied to the resolved label.

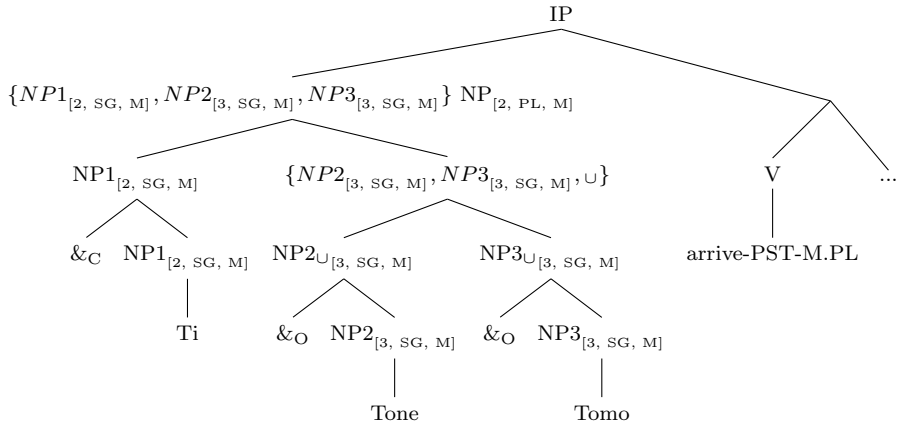
(240)



Now when this coordinate set is merged into a syntactic structure, the resolved features on the coordinate complex will represent the phi features of the conjunct. So

subject verb agreement applies normally by AGREE between the verb and the subject (Chomsky 2001). AGREE is normally thought to use c-command (the Agreeing head must c-command the NP it Agrees with). I assume that the NP reconstruct to its lower position where agree takes place. Another possibility is for AGREE to operate under Phase Command. I will come to this issue in section 3.4.

(241)



To summarize, I have shown that resolution of phi features in a coordinate can be represented via union of the phi features of the conjuncts contained in that coordinate. I have adopted and developed an analysis proposed by Dalrymple and Kaplan. The resolution via union is one of the strongest motivations for Set Label proposed in section 2.1.

3.2 Variation in Closest Conjunct Agreement

Now I will turn to the second type of agreement in the context of coordination, agreement with one peripheral conjunct, which is referred in the literature as closest conjunct agreement (CCA). In this section, I will discuss aspects of variation in CCA. My goal for this section is to point out the various issues in the literature on conjunct agreement and questions that need to be addressed. I will focus on variation in terms of agreement controller (conjunct), agreement goal (the head on which agreement features are valued), linear effects and optionality. In section 3.3, I will discuss and critique the various explanations that have been offered to explain CCA. Then, in section 3.4,

I present my analysis. Following Bhatt and Walkow (2013) and many others, I will propose that CCA occurs according to the linear closeness between the agreeing head and the closest conjunct. However, I contend that the linear effects can be captured in the syntax, and there is no need to delay CCA to PF.

3.2.1 Agreement Controller

One aspect of the variation in conjunct agreement is what conjuncts may control agreement. Cross-linguistically, in languages that exhibit CA, only peripheral conjuncts may control agreement. For example, in Modern Standard Arabic, the first conjunct, *Ali* in (242a), may control agreement, but a non-peripheral conjunct may not. The second conjunct in (242b), *Muna* cannot control agreement on the verb *qaraʔ*, and so the verb cannot have Feminine gender.

(242) Modern Standard Arabic

a. qaraʔ Ali w Muna w Omar kitab-an
read-3SG.M Ali.M and Muna.F and Omar.M book-ACC
'Ali, Muna, and Omar read a book.'

b. *qaraʔ-at Ali w Muna w Omar kitab-an
read-3SG.F Ali.M and Muna.F and Omar.M book-ACC

Languages that allow CA vary in whether they show first conjunct agreement (FCA) or last conjunct agreement (LCA). Some languages show only FCA, like Arabic in VSO word order (Aoun et al. 1994; Munn 1999a). In contrast, many languages exhibit FCA as well as LCA. These languages include Slovenian, Croatian, Hindi-Urdu. In these languages, when the coordinate complex precedes the agreement target, LCA occurs, and when the coordinate phrase follows the agreement target, FCA occurs. So, the conjunct closest to the agreeing element is the conjunct that controls agreement, which is why the phenomenon has been dubbed *closest conjunct agreement* (CCA) (by Benmamoun et al. 2009). In the Croatian example in (243a), the verb *uništena* 'destroyed' precedes the coordinate complex, and agrees with the closest conjunct, *sva sela* 'all villages'. In (243b) the verb follows the coordinate complex, and the verb agrees with the rightmost conjunct, namely *sve varošice* 'all towns'.

(243) Croatian (Bošković 2009, (1a,b))

a. Juče su uništena [sva sela i sve varošice]
yesterday are destroyed.PL.N [all villages.N and all towns.F]
'All villages and all towns were destroyed yesterday.

b. [sva sela i sve varošice] su juče uništene
[all villages.N and all towns.F] are yesterday destroyed.PL.F
'All villages and all towns were destroyed yesterday.'

I should note that the agreement in (243b) cannot be resolved agreement (a feminine plus neuter gives feminine). This is because agreement becomes neuter when the conjuncts are switched as in (244).

(244) [sve varošice i sva sela] su juče uništena
[all towns.F and all villages.N] are yesterday destroyed.N.PL
'All towns and all villages were destroyed yesterday.'

The same facts hold in Slovenian. In (245a), the verb *prodajale* 'sold' agrees in gender with the first conjunct, *radirke* 'erasers', when it precedes the coordinate complex, but it agrees with the last conjunct in gender when it follows the coordinate complex (245b). Again, agreement here cannot be resolved agreement because when conjuncts are switched, the verb agrees with the closer conjunct. Apparently, resolution is not affected by linear order. If agreement in (245b) is resolved, it should be FEM not NEUT.

(245) Slovenian (Marušič et al. 2007, 2, (2)-(3))

a. Najbolje so se prodajale [radirke in peresa].
the.best AUX REFL sold.F-PL erasers.F and pens.N
'The majority of the sold items were erasers and pens.'

b. [Radirke in peresa] so se prodajala najbolje.
erasers.F and pens.N AUX REFL sold.N-PL the.best
'The majority of the sold items were erasers and pens.'

The next aspect of variation in the agreement controller is related to the arguments that may participate in conjunct agreement, that is whether a coordinate syntactic subject or object may control agreement on an agreement target. In most

languages, it is the subject coordinate that may involve CA because those are the only NPs that agree, but in other languages, the subject coordinate may not enter into CA. This is the case in Hindi-Urdu. In Hindi-Urdu, only object coordinate shows CA, while subjects always have resolved agreement. The examples in (246) show that when a coordinate subject controls agreement, agreement must be resolved. Regardless of the gender of the conjunct closest to the verb, the agreement that is valued on the verb is a result of the resolution rules in Hindi. For instance in (246c), in which the subject is a coordinate NP, the auxiliary *rahe* does not agree with the closest conjunct *Sita* in gender (feminine), but agrees with the resolved gender of masculine plus feminine, which is masculine in Hindi. The agreement here is resolved because order does not matter and number is plural. It is surprising, though, that the agreement in (246d) can be masculine although both conjuncts are feminine. It appears that in this case the default agreement value is masculine. Following Bhatt and Walkow (2013), I assume that masculine agreement here is a default that follows language specific rules, and will not discuss it here.

(246) Hindi-Urdu (Bhatt and Walkow 2013, (6))

a. Ram aur Ramesh gaa rahe hãĩ/ *rahaa
Ram and Ramesh sing PROG.M.PL be.PRS.PL/ *PROG.M.SG
hai
be.PRS.SG
'Ram and Ramesh are singing.'

b. Sita aur Ramesh gaa rahe hãĩ/ *rahaa
Sita and Ramesh sing PROG.M.PL be.PRS.PL/ *PROG.M.SG
hai
be.PRS.SG
'Sita and Ramesh are singing.'

c. Ram aur Sita gaa rahe hãĩ/ *rahii *PROG. hai
Ram and Sita sing PROG.M.PL be.PRS.PL/ *PROG.F be.PRS.SG
'Ram and Sita are singing.'

d. Mona aur Sita gaa ((rahii/rahe) hãĩ/
Mona and Sita sing ((PROG.F/PROG.M.PL) be.PRS.PL/
*rahaa hai)
*PROG.M.SG be.PRS.SG)
'Mona and Sita are singing.'

In contrast, when the object is a coordinate, CA may apply, and in this case, the conjunct that is closest to the verb controls agreement. For instance, in (247), the verb *lautaa dii* agrees with the rightmost conjunct *ek kitaab* in gender, which is feminine. Resolved agreement would be masculine in this case given that the combination masculine plus feminine is resolved masculine as in (246a).

(247) Hindi-Urdu

Ram-ne [ek akhbaar aur ek kitaab] un-ke maalik-ko
Ram-ERG [a newspaper.M and a book.F] their.PL-GEN.PL owner-DAT
lautaa dii
return give.PFV-F.SG

'Ram returned a newspaper and a book to their owner.'

Thus in Hindi, in contrast with Arabic for instance, a coordinate subject does not induce conjunct agreement. An analysis of CA should address this difference and explain it.

Languages also impose semantic restrictions on agreement controllers. In some languages, CA only occurs when conjuncts have particular semantic features. For instance, in Russian FCA is allowed when the conjuncts are inanimate, but it is not allowed when the conjuncts are proper names or animates (Glushan 2013). In (248a,b), the conjunct are animates and CA is not possible. In (248c), the conjuncts are inanimates and CA is preferred over than resolved agreement.

(248) Russian (Glushan 2013, 18, (35))

a. Na večere igrali/ *igral Petja i Vanja
on party played.PL/ *played.SG Petja and Vanja
'Petja and Vanja played at the party.'

b. Na večere igrali/ *igral flejist i skripač
on party played.PL/ *played.SG flutist and violinsit
'A flutist and a violinist played at the party.'

c. Na večere ?igrali/ igral magnitofan i radio
on party ?played.PL/ played.SG record.player and radio
'A record player and a radio played at the party.' (glossing and translation modified)

The correlation between animate conjuncts and resolved agreement might be linked to plural number associated with resolved agreement. Bamyaci et al. (2014), on the basis of an experiment, found that plural agreement is dispreferred with inanimate subjects in general not just coordinates, and that plural agreement is preferred with animate subjects. If we apply this generalization to coordinate complexes, we can explain the restriction animacy imposes on CA by arguing that resolved agreement is preferred with animate conjuncts because resolved agreement is plural. Thus the link between animacy and conjunct agreement is not relevant to conjunct agreement per se but is a general fact that appears to be true for plurals in general.

In addition, plurality can be a condition on conjunct agreement as in Croatian. So if the conjuncts are each plural, CA applies. If conjuncts are singulars, conjunct agreement is disallowed. No matter what gender conjuncts are, the gender on the agreeing head will be masculine which is a default agreement in this language (Bošković 2009). For instance, in (249d) the verb *unisteni* 'destroyed' is expected to agree in gender with feminine *jedna varosica* 'one town', but it does not and the agreement that appears on the verb is masculine. Since the coordinates' genders are feminine and neuter, we cannot say that this is resolved agreement. Resolved agreement would be feminine in this case. The agreement here appears to be a default agreement, as pointed out by Bošković.

(249) Croatian (Bošković 2009, 461, (15))

a. Juce su unisteni jedno selo i jedna varosica.
yesterday are destroyed.pl.M one village.N and one town.F
'A village and a town were destroyed yesterday.'

b. Juce su unisteni jedna varosica i jedno selo.
yesterday are destroyed.pl.M one town.F and one village.N

c. *Juce su unistena jedno selo i jedna varosica.
yesterday are destroyed.pl.N one village.N and one town.F

d. *Juce su unistene jedna varosica i jedno selo.
yesterday are destroyed.pl.F one town.F and one village.N

The same observation holds for Slovenian. In (262), the conjuncts are singular and the agreement is not with the closest conjunct. Instead, we see dual masculine agreement on the verb, which is a result of the resolution rules in this language.

(250) Slovenian

[Ena banana in eno jajce] sta padla na tla.
[one bananaF-SG and one egg.N.SG] AUX.DU fell.M.DU on ground

'A banana and an egg fell on the ground.' (Marušič et al. 2007, 6, (12))

Marušič et al. note that when a neuter and a feminine plural are conjoined, CA occurs. Thus, plurality seems to be a condition on CA in Slovenian as well.

(251) Slovenian (Marušič et al. 2007, 5,(7)-(8))

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

b. 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.'

To recapitulate, I have discussed some of the restrictions some languages impose on conjunct agreement. These restrictions include what peripheral conjuncts may control agreement. Some languages exhibit only FCA, while other exhibit both FCA and LCA. In the languages that I have looked into, there is no language that exhibits only LCA. In addition, languages vary on what arguments of the verb may control agreement. One instance of this restriction is Hindi in which a subject coordinate always shows resolved agreement and does not show CA. Other restrictions are related

to the features of the conjunct including features like animacy and plurality. Inanimate coordinates prefer resolved agreement in some languages. In some languages singular conjuncts do not allow conjunct agreement but trigger a default agreement on the verb as is the case in Croatian and Slovenian. The languages that I have looked into do not show only LCA pattern.

3.2.2 Heads

Languages vary in what heads may value CA. Even within a language that exhibits CA, CA does not occur with all functional heads. For example, in Hindi, CA occurs with T, but it cannot occur with C because agreement with a complementizer is not available. On the other hand, in languages like Dutch and Bavarian, CA occurs with C but not T. In (252), the complementizer *dass-st* 'that' agrees in person and number with the first conjunct *du*, and in (253) the complementizer *de-s* agrees in person and number with the first conjunct *doow* 'you'. In Bavarian, verbal agreement i assume to occur via AGREE with T.

(252) Bavarian

dass-st du and da Hans noch Minga geh-st/%geng-an
that-2SG you.SG and the Hans to Munich go-2PL/go-3PL
'that you and Hans are going to Munich.' (Fuβ 2014, 70, (30a))

(253) Dutch

Ich dink de-s doow en ichô kenne treffe
I think that.2SG you.SG and I each other can meet
'I think that you and I can meet.' (van Koppen 2008, (3a))

Agreement is not restricted to agreement with T or C, CA may occur with an adjective within a NP. In Spanish prenominal adjectives agree only with the first conjunct while postnominal adjective agrees with the last conjunct. In (254), the article *una* and the adjective *inoportuna* agree with the first nominal conjunct *llovizna* in person and number, while the postnominal adjective *pertinaz* agrees with the last conjunct in number (LCA). Note that both As are interpreted as modifying both NPs.

(254) Spanish

una inoportuna llovizna y viento pertinaz, nos
an.F.SG untimely.F.SG drizzle.F.SG and wind.M.SG persistent.SG us
mantuvieron atados dos días en tierra firme.
keep.PST.3PL moored two days to ground solid

'An inopportune and persistent drizzle and wind kept us moored to land for two days.' (Demonte and Pérez-Jiménez 2012, (4a))

Thus conjunct agreement might be with T and C. It appears that what heads may exhibit conjunct agreement is language specific.In section 3.4, I will show that agreement accompanying Case checking is resolved, and agreement separate from Case is CA.

3.2.3 Linear Closeness

Variation in CCA involves linear closeness as well. Linear order between the head on which conjunct agreement is valued and the conjunct that triggers agreement is a crucial factor for CA. This is due to the fact that the conjunct that controls agreement is the one closest to the target. In many languages resolved agreement is obligatory when the conjunction precedes the agreement target. These languages include, Arabic (Aoun et al. 1994; Munn 1999a), Hebrew (Doron 2000), Brazilian Portuguese (Munn 1999), and Bavarian (van Koppen 2008; Fuβ 2014). However, when the coordinate complex follows the agreement target, in these languages, conjunct agreement may apply. For example, in Modern Standard Arabic SVO word order conjunct agreement is not possible. In (255a) in which the coordinate precedes the verb, only masculine plural agreement is possible, which is resolved agreement here.

(255) Modern Standard Arabic

a. at-tilmiið-ah wa at-tilmiið
the-student.F.SG and the-student-M.SG
qadam-{$*\emptyset / *at / u / *n$} al-imtiħan
take-{$*3M.SG / *3F.SG / 3M.PL / *3F.PL$} the-test
'The student (FEM) and the the student (MASC) took an exam.'

b. qadam-{∗Ø/*at*/ ∗ *u*/ ∗ *n*} at-tilmiið-ah wa
take-{∗3*M.SG*/3*F.SG*/ ∗ 3*M.PL*/ ∗ 3*F.PL*} the-student.F.SG and
at-tilmiið al-imtiħan
the-student-M.SG the-test
'The student (FEM) and the the student (MASC) took an exam.'

Another issue is adjacency. Benmamoun et al. (2009) and Walkow (2013) note that there is variation in whether strict adjacency between the agreement controller and target is required for CA to apply. In some languages intervening material between the agreement target and the agreement controller bleeds CA. For instance, in Tsez, CA applies only when the verb and the conjunct are strictly adjacent (Benmamoun et al. 2009, (23)). I will not discuss the resolution of gender (noun class), but I will assume that the resolution of II and III as I in example (256a) is correct. The example has ii and i, with first conjunct agreement with II. Now when the conjunct and the verb are adjacent, the verb agrees with the conjunct in gender, here II. But when something intervenes between the verb and the conjunct, resolved agreement applies, that is I gender.

(256) Tsez (Benmamoun et al. 2009, 78, (23))

a. y-ik'-i-s kid-no uži-n
ii-went girl.abs.ii-and boy.abs.i-and
'A girl and a boy went.'

b. *y-ik'i-s iduɣor kid-no už-n
ii-went home girl.abs.ii-and boy.abs.i-and

In contrast, in Hindi and Slovenian, CA applies with no restrictions and intervening material does not block agreement. In (257), a relative clause intervenes between the last conjunct *postelje* 'bed' and the verb *smrdele*, but still the verb agrees with the last conjunct. The RC is part of the NP that agrees, so this should not matter for AGREE. But intervention was highlighted in compositional agreement models, which I will discuss in section 3.3.3. In these models agreement is valued at PF where

precedence relations matter. Similarly, in (258), an indirect object *maalik-ko* 'owner' intervenes between the verb *lautaa dii* 'return' and the coordinate direct object *ek akhbaar aur ek kitaab* but still the verb agrees with the last conjunct. So adjacency does not seem to matter here.

(257) Slovenian

šotori in postelje ki so jih dali vojaki, so smrdele
tent.M.PL and bed.F.PL that AUX them gave solders.M AUX stank.F.PL
'Tents and beds that were given by the soldiers stank.' (Marušič et al. 2007, (14))

(258) Hindi-Urdu

Ram-ne ek akhbaar aur ek kitaab un-ke maalik-ko lautaa
Ram-erg a newspaper.M and a book.F their.PL-gen.PL owner-dat return
dii
give.PFV-f.SG
'Ram returned a newspaper and a book to their owner.' (Bhatt and Walkow 2013, 960, (11))

Thus, languages vary in whether they allow LCA when the head that values agreement follows the coordinate complex. Arabic requires resolved agreement when the agreeing head follows the coordinate, while Slovenian and Hindi-Urdu permit LCA. . They also vary in whether they impose strict adjacency on the application of CA. An analysis of CA should be able to derive this aspect of variation.

I should point out that under standard assumptions, adjacency should not matter since agreement is assumed to be a result of AGREE between a probe and a goal, which should not be affected by intervening constituents. I will not address this issue and leave it for further investigation.

To wrap up this section, I have discussed many aspects of variation in CA across languages. Languages vary in the restrictions they place on the conjunct that controls agreement, the head on which agreement is valued, and effects of linear proximity and adjacency requirements. In the sections to come, I will attempt to answer the following

questions: What triggers CA? Why and when does resolved agreement fail to apply? Are linear effects in CA a fact that we can find an analysis for in narrow syntax, or are linear proximity effects a reflex of agreement valuation at PF.

3.3 Previous Analyses

In the last section, I have shown that in some languages a peripheral conjunct values agreement. But what drives conjunct agreement? What causes resolved agreement to fail to value agreement? While much literature provided accounts of how conjunct agreement applies, less attention has been directed at the questions of why resolved agreement fails and what drives conjunct agreement. In this section I will go over, discuss, and critique some of the previous accounts.

3.3.1 Analyses Based on Syntactic Prominence

The earliest accounts of CA were proposed within the framework of GB. These analyses focused on FCA and derived the phenomenon from the idea that the first conjunct is structurally more prominent. The first conjunct is the highest accessible conjunct for agreement either in a spec-head relation (Aoun et al. 1994) or via exceptional government (Munn 1993).

To account for why resolved agreement fails to apply in VSO word order in Arabic, (Aoun et al. 1994) propose that coordinate subjects in VSO and SVO word orders do not have equal syntactic status. They argue that CA in VSO is a result of clausal coordination plus ellipsis, while resolved agreement in SVO is simple NP coordination. They base this analysis on the observation that when CA applies, a number sensitive item (NSI), which requires a plural antecedent, is impossible. But, it is possible with SVO word order where resolved agreement applies. For instance, in Moroccan Arabic *b-žuuž* 'together' is impossible when CA applies. Similarly, in Lebanese, *sawa*, 'together', is not possible when CA applies.

(259) Moroccan Arabic (Aoun et al. 1994, 211, (35))

a. ʕumar w Saʕid mšaw b-žuuž l-l-mədrasa
Omar and Said went.P with-both to-the-school
'Omar and Said went to school together.'

b. *mša ʕumar w Saʕid -žuuž l-l-mədrasa
went.3MS Omar and Said with-both to-the-school

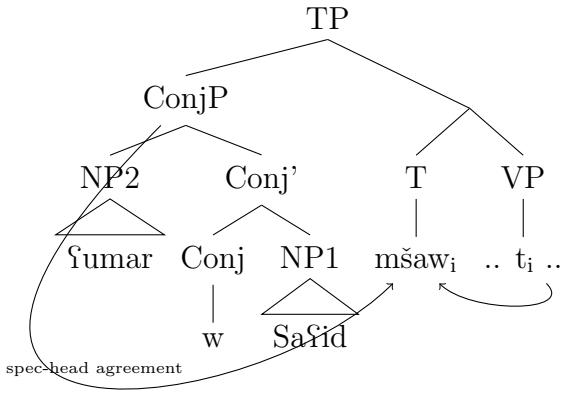
(260) Lebanese Arabic (Aoun et al. 1994, 211, (37))

a. Kariim w Marwaan raaħo sawa.
Kareem and Marwaan left.P together
'Kareem and Marwaan left together.'

b. *Raaħ Kariim w Marwaan sawa.
left.3Ms Kareem and Marwaan together

In Aoun et al.'s analysis, in SVO resolved agreement occurs as a result of spec-head agreement between the coordinate subject and the verb which has moved to T.

(261)



On the other hand, Aoun et al. propose that in fact what appears as CA is normal subject-verb agreement between *ʕumar* and *mša*. The analysis of (262a) would look like (262b) according to Aoun et al.'s analysis. But I am not sure how the ellipsis applies here. In their analysis, Aoun et al. do not clearly show how ellipsis works.

(262) a. mša ʕumar w Saʕid l-l-mədrasa
went.3MS Omar and Said to-the-school
'Omar and Said went to school.'

b. [[IP mša ʕumar ~~l-l-mədrasa~~] w [IP ~~mša~~ Saʕi l-l-mədrasa]]

Therefore, Aoun et al argue that what appears to be FCA in VSO is just typical subject-verb agreement between the subject of the first clause and its verb, but it appears as partial agreement because the first clausal conjunct is reduced by ellipsis. On the other hand, in SVO order which Aoun et al argue involves true NP coordination, resolved agreement occurs as a result of spec-head agreement between the coordinate complex and the verb which has moved to T.

Munn (1999a) argues against Aoun et al.'s clausal analysis of coordination. Munn contends that Aoun et al. miss the distinction between syntactic plurality and semantic plurality. He presents arguments that show that CA occurs even when a clausal analysis of coordination is impossible. For instance, Munn demonstrates that in cases where FCA holds, semantic elements may occur which require that the coordinate complex be taken as syntactic plural. One of these elements is identity adjectives like *same* and *different*. In (263a), the coordinate complex behaves like it is semantically plural but syntactically singular. The acceptability of the singular 'the-group' shows that semantic plurality is sufficient to license *nifs* 'same' (263b). This example could not be analyzed as clausal coordination plus ellipsis. In order for *nifs* to get an internal interpretation, it requires a collective argument. This would not be available with clausal coordination plus ellipsis. In other words, the NSIs are sensitive to syntactic plurality, not semantic plurality. They are ungrammatical with syntactically singular but semantically plural nouns like 'group'. Munn suggests that the are ungrammatical in FCA because the subject is syntactically singular.

(263) Moroccan Arabic (Aoun et al. 1994, 652, (22))

a. qrat ʕalya w ʕomar nəfs lə-ktab
read.F.SG Alia and Omar same the-book
'Alia and Omar read the same book.'

b. qrat ž-žmaʕa nəfs lə-ktab
read.F.SG the-group same the-book
'The group read the same book.'

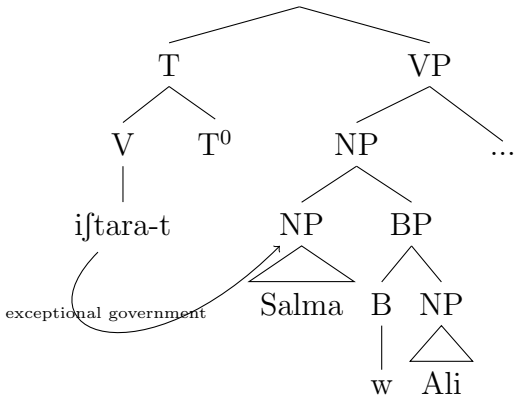
Munn proposes agreement under government. Agreement takes place through exceptional government where a head can govern the specifier of its sister. Following Benmamoun (1992), Munn assumes that in VSO order the subject remains inside VP. After the verb moves to T, V+T can govern the first conjunct via exceptional government. Munn assumes that the coordinate complex involves adjunction, and assumes a Boolean Phrase (which is the same as &P). The structure is illustrated in (265) for (264).

(264) Jordanian Arabic

iʃtara-t Salma w Ali ipad
buy-3MS Salma.F and Ali.M ipad

'Salma and Ali bought an iPad.'

(265)



However, it is not clear why resolved agreement does not apply in this analysis. Nothing should prevent it from applying since the coordinate complex's label is governed by the verb in Munn's analysis.

More recent proposals by Larson (2013) and Soltan (2007) are similar to Munn's in that they assume that the structural prominence of the first conjunct is what explains CA. Although these analyses differ in their details, they both attempt to derive FCA from the assumption that agreement occurs with the first conjunct before the coordinate complex is fully derived. Thus agreement occurs with the first conjunct at

the point it is merged into the derivation and before the rest of coordinate complex is fully merged and labeled. Consider the example below which involves FCA.

(266) Moroccan Arabic

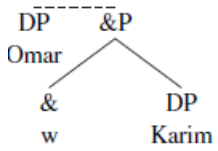
žaa omar w karim
came.SG/PL Omar and Karim

'Omar and Karim came.' (Larson 2013, 619, (33); adapted)

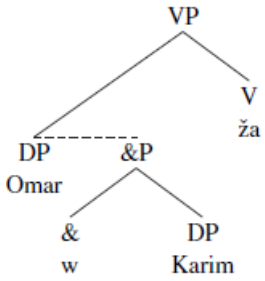
To account for FCA in Arabic VSO word order, Larson (2013) proposes that partial agreement can be captured if one assumes decomposed merge (Hornstein 2009). Decomposed merge involves two processes: Concatenate and Late Label. Decomposed merge for (266) is illustrated in (267). The NP *Omar* hosts *w Karim* via Concatenate. The label of the coordinate is the label of *Omar*, a DP. The dotted line is an adjunction relation. Under the concatenate and Label analysis, the first conjunct does not c-command subsequent conjuncts. Now agreement occurs at this point before Label occurs via AGREE with the first conjunct. Here Larson assumes that the derivation proceeds bottom-top. So the coordinate complex is merged into the derivation before the verb is merged. But the whole coordinate has not been labeled yet, allowing *Omar* to independently agree with the verb upon its merger.

(267) CA via Decomposed Merge (Larson 2013, 620, (34)-(35))

a. Step 1



b. Step 2



A similar analysis is proposed in Soltan (2007) in which an adjunction structure is assumed as well. Soltan assumes a late merge model in which the coordinator along with non-initial conjuncts are late adjoined after the agreement with the first conjunct occurs. In (268), Soltan derives agreement through Agree with *a man* before the late merger of *and two women*. [2]

(268) There is a man and two women in the room.

Now the question is: do the late merge or concatenate and label models capture LCA facts? These accounts assign prominence to the first conjunct in particular. How can we adapt these analyses to capture LCA in Croatian, for instance?

(269) Croatian

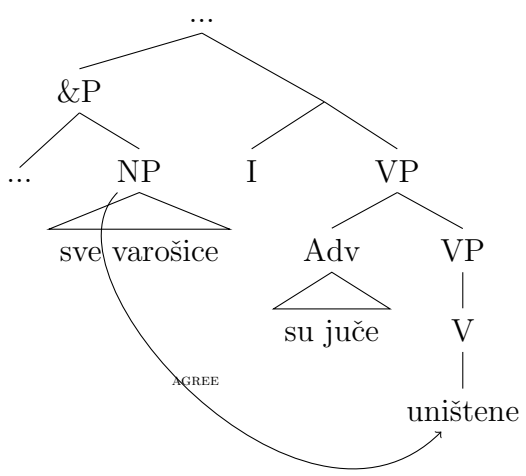
[sva sela i sve varošice] su juče uništene
[all villages.N and all towns.F] are yesterday destroyed.PL.F

'All villages and all towns were destroyed yesterday.' (Bošković 2009, (1b))

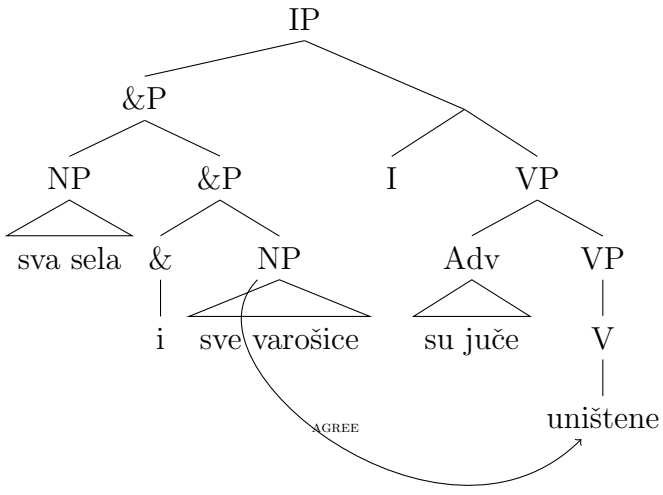
[2] Agreement in *there*-constructions was thoroughly investigated in Morgan (1972, 1984). Morgan's work was the earliest that addresses conjunct agreement in English. However, I believe that apparent CA in these contexts is not actually CA. Rather, it is regular subject-verb agreement between the coordinate and the verb. The singular agreement observed in existentials with a coordinate subject occurs when the coordinate is construed as singular, or when a non-syntactic factor affects agreement. For the first possibility, see Heycock and Zamparelli (2005) and Champollion (2015). For the second possibility, consult Reid (2011).

One way is to run the derivation bottom-top in which the last conjunct is merged first and in which LCA occurs prior to merging the rest of conjuncts, as I diagram in steps that show agreement for (269) below.

(270) a. Step 1: Merge *i sve varošice*



b. Step 2: Merge the rest of the conjunction



There are still a number of problems when we want to account for LCA via late merge analysis. First, we cannot account for FCA and LCA using the same direction of derivation (bottom-top or top-bottom). In a bottom-top model, only LCA can be captured, and in top-bottom model only FCA is captured. Therefore, the accounts that hinged on the idea that the first conjunct is more prominent do not capture LCA, even when we attempt to generalize these analyses.

3.3.2 Movement Based Analyses

A number of analyses have attempted to link CA to movement. I will address two proposals in this section: Bošković (2009) and Walkow (2013). Then, I will show that movement is irrelevant to CA because the arguments for movement run into problems.

I will start with the proposal advanced in Bošković (2009). Before I present Bošković's analysis, I need to point out a number of assumptions and facts on which the analysis is based. First, following van Koppen (2005; 2008), Bošković assumes that AGREE may involve PIED-PIPING of the constituent that values agreement. Second, Bošković notes that CA occurs only when conjuncts are plural. When conjuncts are singular, the agreement is default masculine singular (see examples in (249)). This led Bošković to assume that the coordinate complex has a plural number feature. He proposes that when CA occurs, the agreeing probe takes its gender feature from the conjunct it agrees with and its number feature from the coordinate complex, which means that a head may value its unvalued features from two heads in multiple AGREE operations (Béjar 2003; Rezáč 2003). Third, Bošković claims that the first conjunct is extractable based on the sentence below.

(271) Croatian

?knjige$_i$ je Marko [t$_i$ i filmove jupio
books is Marko t$_i$ and movies bought

'Marko bought books and movies.' (Bošković 2009, 472, (30))

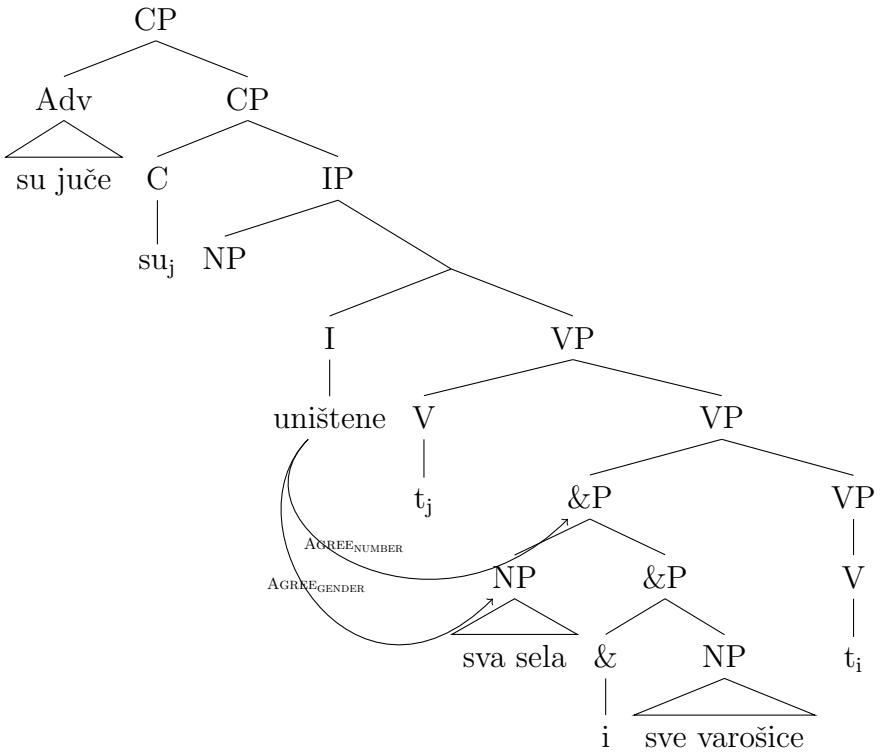
Now I turn to Bošković's analysis of FCA and LCA. In his analysis, FCA results when the probe values its number feature and gender feature from the conjunct phrase and the first conjunct respectively. The valuation occurs via AGREE which scans the probe's c-command domain and values features.

(272) Croatian

Juče su uništena [sva sela i sve varošice]
yesterday are destroyed.PL.N [all villages.N and all towns.F]
'All villages and all towns were destroyed yesterday. (Bošković 2009, (1a))

As shown, in (273), the verb *uništene* probes for agreement features, it encounters &P and values its number feature, plural here. Bošković assumes that in Croatian, &P does not have gender features. Therefore, the verb probes again for gender features which it values from the first conjunct *sva sela*. Bošković's analysis of FCA, then, involves two agreement relations: one between the agreeing head and &P to value number features, and one with the first conjunct to value the gender feature.

(273)



Boskovič claims that LCA results when AGREE requires pied-piping of the goal. In particular, Bošković argues that since both of &P and the first conjunct in Croatian are potential targets of pied-piping, AGREE is canceled because the grammar cannot decide which constituent to move. This unsuccessful probing attempt results in deletion of valued uninterpretable features of the first conjunct, though. Then, the computation enlarges the search domain and re-initiates a second attempt at AGREE. Since the uninterpretable features of the first conjunct are now deleted (Bošković assumes the &P lacks gender features), it is no longer a potential target for agreement. Consequently, agreement occurs with the second conjunct because it is non-pied-pipe-able, as moving it would violate the Coordinate Structure Constraint (CSC). Thus, for Bošković CA interacts with agreement on the basis of the assumption that some probes have EPP features, and thus they require pied-piping the constituent involved in agreement.

For instance, in (274), where the subject, *sva sela i sve varošice* precedes the verb *uništene*, presumably Bošković assumes that in this word order some EPP feature triggers the movement of the subject from somewhere. Both the first conjunct and the whole coordinate are potential targets of agreement with the verb. Consequently, the first attempt of AGREE fails. The attempt results in deactivating the uninterpretable features on the first conjunct, making agreement with it impossible. When AGREE is re-initiated, the probe resorts to agreement with the second conjunct.

(274) Croatian

[sva sela i sve varošice] su juče uništene
[all villages.N and all towns.F] are yesterday destroyed.PL.F

'All villages and all towns were destroyed yesterday.' (Bošković 2009, (1b))

There are a number of issues with Bošković's analysis. Boskovič makes no mention of cases that have more than two conjuncts. His analysis predicts that in case of coordination with more than two conjuncts, agreement with the second conjunct should be possible since the second conjunct is non-movable. However, agreement with non-peripheral conjuncts is unattested crosslinguistically.

Another issue with Bošković's analysis is his assumption that the conjunct phrase lacks a gender value. This assumption seems to be stipulative since the conjunct phrase must have gender value in case resolved agreement applies.

Resolved agreement applies "either as agreement with the same gender values when conjuncts match in gender, or as default agreement (masculine plural for Serbo-Croatian)" (Murphy and Puškar 2014). In fact, Bošković does not show under what conditions resolved agreement fails to apply. The only restriction he points out is plurality. When conjuncts are plural, CA applies. Bošković claims that in CA the conjunction phrase lacks gender. This is problematic when we look at resolved agreement. The coordinate complex must have resolved phi features. Resolved agreement applies "either as agreement with the same gender values when conjuncts match in gender, or as default agreement (masculine plural for Serbo-Croatian)"(Murphy and Puškar 2014) . Bošković 2009 claims the &P lacks gender. It is not clear how resolved agreement occurs under this assumption. The standard assumption is that resolved agreement occurs with the coordinate's topmost node where resolved agreement is copied (**?**).

(275) Croatian

sve majke i kćerke su išle po prodavnicama.
all mother.F.PL and daughter.F.PL are go.PER.F.PL in shops

'All mothers and daughers went to the shops.' (Murphy and Puškar 2014, 2, (2))

In addition, Bošković's claim that the first conjunct may be pied-piped does not seem to be true. We see that (271) is not highly grammatical. I believe that this particular case is a comitative. In section 4.1, I argue that all cases of apparent movement of an initial conjunct are actually comitatives.

Now I move to the second proposal that argues that there is a relation between movement and CA, namely Walkow (2013). Walkow notes that in some languages agreement and movement seem to operate independently of each other. For instance in Icelandic phi-features on a given probe may be satisfied by agreeing with one element,

but the EPP feature on the same probe can be satisfied by moving another element to its specifier as in (276) (Taraldsen 1995; Walkow 2013). Walkow explains this by assuming that phi-features and EPP features can be satisfied/valued by two different goals.

(276) Icelandic (Taraldsen 1995, 307)

Henni leidd-u-st peir
she.DAT was.bored.by-3PL they.NOM

'She was bored with them.'

Walkow claims that agreement with a conjunct that is not closest is possible in some languages, such as Zulu (Anagnostopoulou 2003). He refers to this phenomenon as *true conjunct agreement*. Walkow remarks that true FCA occurs when EPP and unvalued phi features are present on the same (agreeing) head but can AGREE independently of one another. In this case, the coordinate complex moves and checks its EPP feature, but phi features would still be valued by the first conjunct. For instance, in (277), in Walkow's analysis, the verb values its phi features by agreeing with *utshwala* 'beer', but presumably checks its EPP feature by moving the whole coordinate.[3]

[3] However, I am not sure about how resolution actually works in this case. A similar case was included in Bosch (1988) who remarks that the meaning is comitative. If the sentence involves a comitative, then the agreement on the verb is not an instance of CA. (See section 4.1.2.)

(1) Zulu

Umfazi ne-ngane yakhe ufikile
1-woman and-9-child has(1) arrived

'The woman with her child has arrived.' (Bosch 1988: p72 : ex. 15)

(277) Zulu

utshwala ne-wa-yin (ku-/bu-/*li)tholakele
14-beer and-5-wine (def-/14-/*5)were.Found

'Beer and wine were found.' (Walkow 2013, 3, (5); field notes by Alya Asarina)

Thus Walknow claims is that conjunct agreement may occur with the conjunct that is not closest in some cases, and hypothesizes that movement interacts with conjunct agreement. Apparently, Walkow's proposal is limited in scope, where it appears that conjunct agreement is not with the closest conjunct.

Therefore, movement does not seem to be a factor in conjunct agreement. The proposals discussed above run into problems. There should be some other factor that governs CCA. I will show that it is linear closeness that plays a primary role in this phenomenon.

3.3.3 Compositional Agreement Analyses

Since accounts which hinged on AGREE with the highest accessible conjunct do not explain cases of LCA, a number of researchers propose that the valuation of CCA is split between the Syntax and PF components (Marušič et al. 2007; van Koppen 2008; Benmamoun et al. 2009; Bhatt and Walkow 2013). This approach has been called *Compositional Agreement*.

One of the analyses that spell out the assumptions of this approach for CA is Benmamoun et al. (2009). Benmamoun et al. proposed that CCA is split between Syntax and PF component. The basic assumption is that an agreement relation is established in the syntax, but is not valued until PF where the valuation is based on linear proximity between the agreement controller and the agreement target.

An earlier study which also adopted a similar analysis is van Koppen (2008). van Koppen assumes that CA is split between syntax and PF. To explain the optionality of complementizer agreement in Dutch, van Koppen suggests that the role of syntax is to specify the nodes that can act as potential goals of agreement. She also introduces the concept of *equidistance* which states that the first conjunct phrase and the conjunction

phrase are of equal distance to the probe. A coordinate complex and the first conjunct parsing from left to right are of equal distance to a probe that precedes the coordinate complex. Since they are equidistant, she hypothesizes that two AGREE relations occur, one with the conjunction phrase and the other with the first conjunct. However, agreement is not actually valued until PF where grammar freely chooses one of the two agreement options. An important remark here is that if equidistance is defined in terms of linear order, the coordinate complex and the last conjunct will be equidistant as well, because the last conjunct ends at the same point that the coordinate complex does. If distance is defined linearly. The final conjunct as well as the initial conjunct will be equidistant the same way from the agreeing head in LCA and FCA respectively, as I schematize below. The two brackets are equally distant from H in both cases.

(278) a. H [[

b.]] H

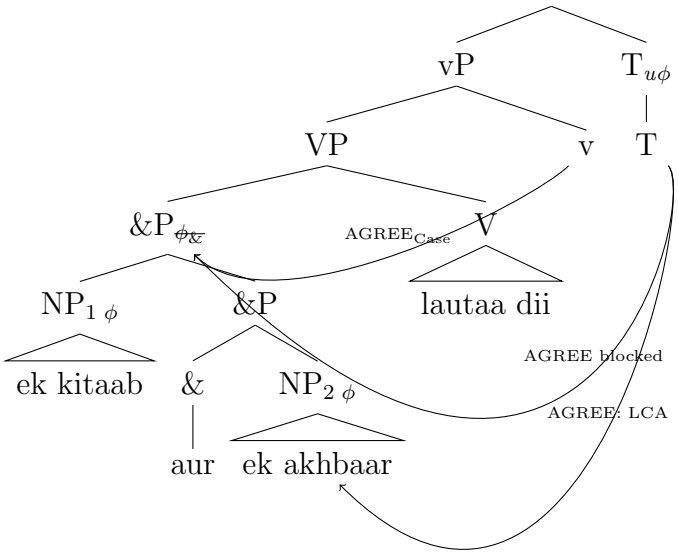
A recent study which clearly spells out how both FCA and LCA occur in a compositional agreement model is Bhatt and Walkow (2013). Bhatt and Walkow propose the CCA results from the failure to value agreement in the syntax. In particular, focusing on CCA in Hindi-Urdu, they show that assigning case to a coordinate object results in deactivation of phi features of the coordinate, that is resolved features. Thus, when T probes for phi features, resolved agreement fails to occur. Instead, assuming that AGREE is split into MATCH and VALUE, only MATCH occurs in the syntax, while VALUE occurs at PF, where valuation occurs according to the linear closeness between the agreeing head and the conjunct. To illustrate this for (279), in (280), upon the merger of the verb *lautaa dii*, little v assigns Case to the object *ek kitaab aur ek akhbaar*. This results in the deactivation of the phi features of the coordinate complex. When T is merged, it probes for phi feature. Since resolved phi features are now deactivated, only MATCH occurs; T matches its features with &P in the syntax. VALUE is delayed to PF. Where T agrees with the linearly closest conjunct, *ek kitaab*, resulting in LCA.

(279) Hindi-Urdu

Ram-ne ek akhbaar aur ek kitaab un-ke maalik-ko
Ram-ERG a newpaper.M and a book.F their.PL-GEN.PL owner-dat
lautaa dii
return give.PFV-F.SG

'Ram returned a newspaper and a book to their owner.' (Bhatt and Walkow 2013, 960, (11))

(280)



An explanation of why phi features of a coordinate are deactivated by case assignment is due. Walkow (2013) remarks that for the conjunct phrase to comply with the case filter, spreading of case must occur. The only way to guarantee that case spreads to all conjuncts is for AGREE to occur with the coordinate complex's topmost node. Walkow proposes that in general, CA occurs only where agreement and Case checking are divorced. Empirical facts support this generalization. In Bavarian, CA is possible with the complementizer which is a non-case assigning head while it is not possible with T which is a case assigning head (see below.)

While Bhatt and Walkow's analysis explains how CCA applies, their assumption that it should be satisfied at PF can be debated. The motivation in the compositional agreement analysis like Bhatt and Walknow's for locating CCA at PF is the belief that linear order is not specified until PF. In their models, only hierarchy is specified in the syntax and linear order is not determined until spellout. However, the facts presented in section 2.6 about linear effects in selection make a strong argument for putting linear order in the syntax, given that selection must be accomplished in the syntax and cannot be postponed to PF. This will be my basis for proposing an analysis that captures CCA in the syntax. (See below.)

3.4 An Account of Closest Conjunct Agreement (CCA)

3.4.1 Proposal

In section 2.6, I have shown that selection facts argue that linear order can be put in the syntax. In this section, I show that linear effects in conjunct agreement can also be captured in the syntax. Contra Bhatt and Walkow (2013), I argue that there is no need to delay CCA to the PF. I define linear closeness below.

(281) Linear Closeness

X is closer to Y than Z if the set of elements linearly intervening between X and Y is a proper subset of the elements linearly intervening between Z and Y.

To present my analysis, I will start with a simple case of CCA, namely FCA in Bavarian. Consider the example below.

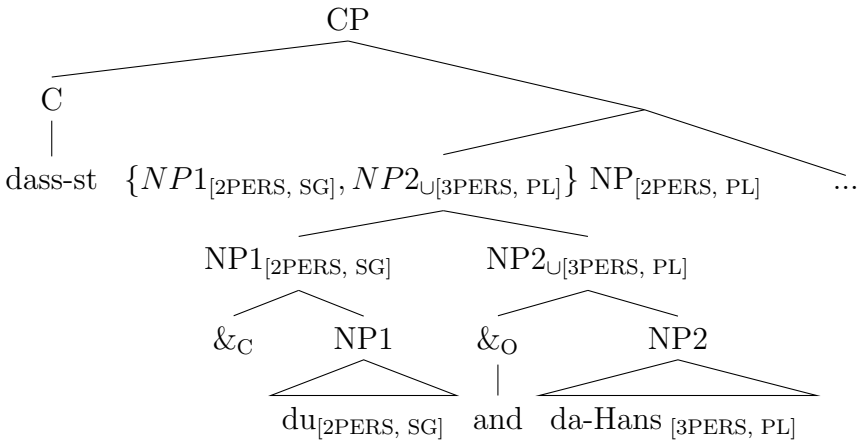
(282) Bavarian:

dass-st	du	and	da	Hans	noch	Minga	geh-st/??	geng-an
that-2SG	you.SG	and	the	Hans	to	Munich	go-2PL/go-	3PL

'that you and Hans are going to Munich.' (Fuβ 2014, 70, (30a))

The derivation proceeds from left to right by merging the complementizer then the subject.

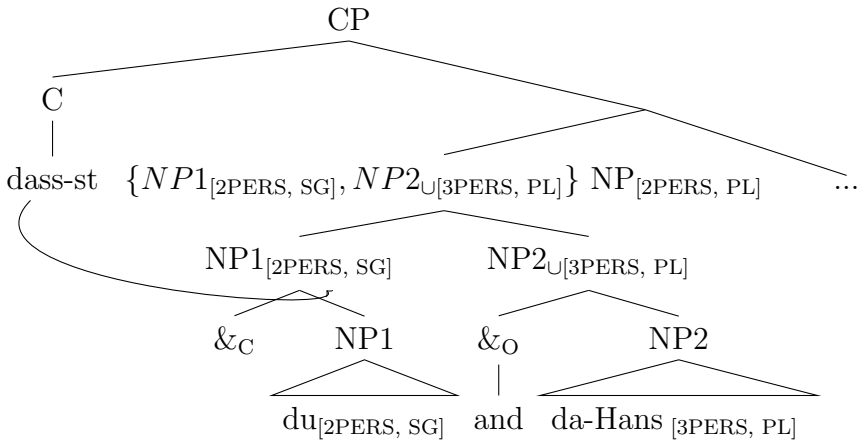
(283)



In this case, the head that checks case (T) is merged *after* the head that agrees in phi-features (C) in a left-to-right model. In other cases below, the head that checks case is merged *before* the head that agrees in phi-features. I assume that heads that only agree in phi features and do not check case agree with whatever is closest to them. This is one-way agreement, so the heads do not affect the features of what they agree with in any way. Heads that check case have to agree with the whole coordinate so that case can spread and every NP can be case licensed.

Since C does not check case. All it requires is *some* phi features to Agree with. Thus, it does not wait for the full coordinate complex to be built. It just Agrees with the first conjunct before the other conjuncts are merged, as in (284). If a head is checking case, though, it has to wait until the whole coordinate phrase is built, or else that phrase will not be case licensed and the derivation will crash.

(284)



When T merges into the derivation, it agrees with the coordinate subject. Here I assume that the condition on agreement is Phase Command, rather than c-command, as reproduced below.

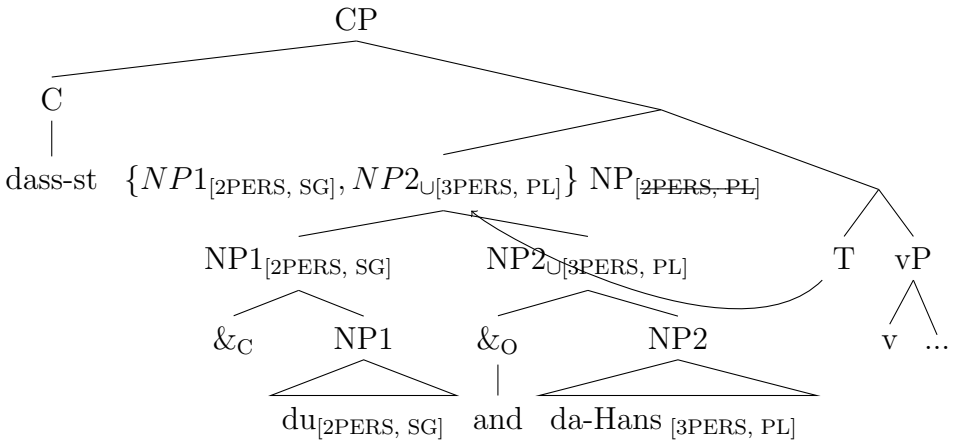
(285) (Bruening 2014, 343, (2)-(3))

a. Phase-command: X phase-commands Y iff there is no ZP, ZP a phasal node, such that ZP dominates X but does not dominate Y.

b. Phasal nodes: CP, vP, NP

T can agree with the subject because there is no phasal node that dominates T but does not dominate the subject. T agrees with the resolved features of the coordinate's topmost node. Following Bhatt and Walkow (2013) and Bhatt (2005), I will assume that Case assignment to the coordinate complex results in deactivation of resolved phi features on the coordinate complex's node.

(286)



The assumption that non-case-checking heads only require to agree with some phi features would explain the optionality of FCA in Bavarian as reported in van Koppen (2008) and Fuß (2014). C can either agree with the first conjunct before the entire coordinate is constructed or agree with the coordinate complex after it is fully built.

An important issue that needs to be addressed is agreement with simple NP subjects. We have adopted the analysis which says that assigning Case to a coordinate complex results in deactivation of its phi features. What about simple NPs? Does Case assignment result in deactivation? Obviously not, otherwise agreement with a subject, that has been assigned case by T would not be possible. I hypothesize that the phi features of a coordinate complex, that is resolved features, are extrinsic features, because they are features that have been computed from individual conjuncts. In contrast, features of simple NPs are intrinsic features that are tied to the semantics of the NP. I assume that extrinsic features, like the ones in a coordinate complex are deactivated and deleted upon Case assignment. Intrinsic features, in contrast, remain present even after Case assignment.

In what follows, I explain how my analysis explains CCA in Slovenian, Hindi-Urdu, and Modern Standard Arabic.

3.4.2 FCA and LCA in Slovenian

Now consider the examples in (287) from Slovenian. I will show how my analysis captures FCA and LCA agreement in these examples.

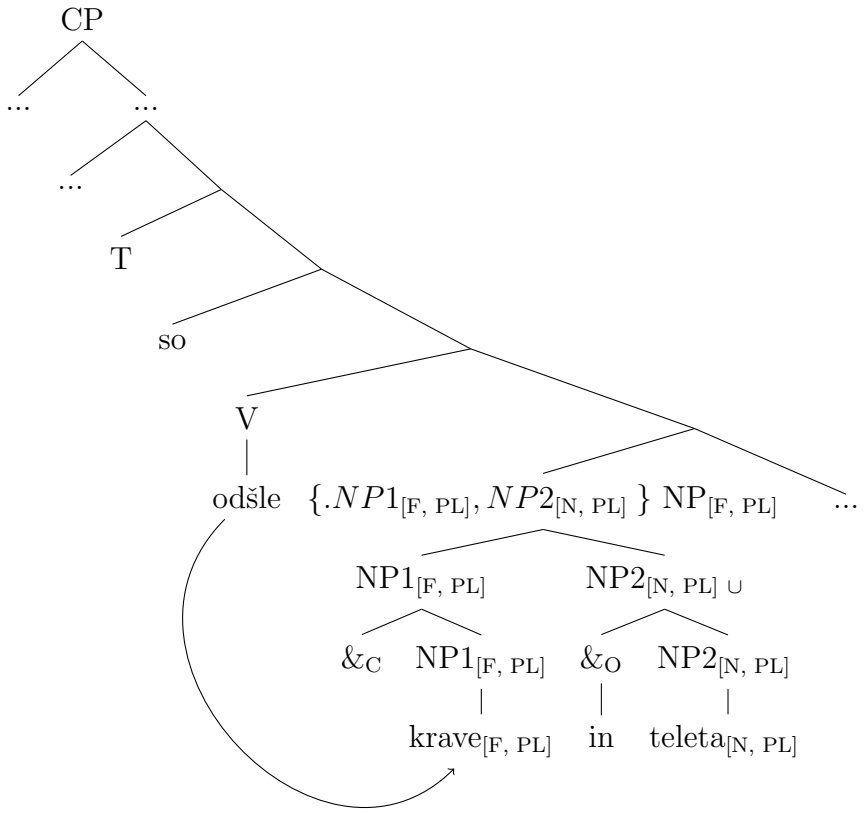
(287) Slovenian (Marušič et al. 2007, 5, (8)-(9))

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 claves went grazing.'

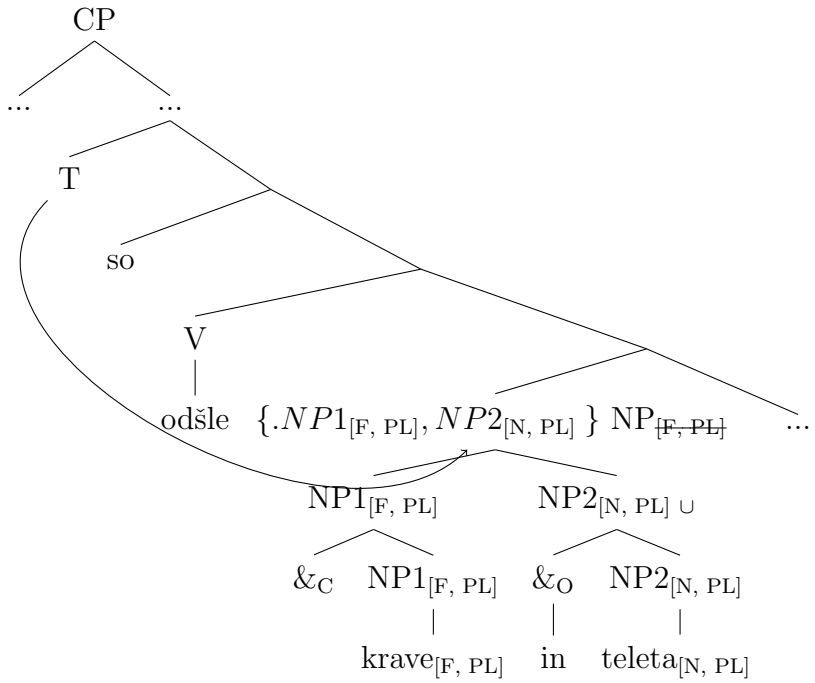
To start with the FCA case in (287a), I assume that the subject is merged in a lower position than T here because the auxiliary *so* and the verb *odšle* both precede the subject. V is a non-case checking head, so all it requires is some phi features. Thus, it can agree with the first conjunct as soon as it is merged. This results in FCA. Note that T cannot agree with the coordinate because T is a case checking head. T needs to license the whole coordinate and this would not be possible without agreeing with the coordinate's topmost node.

(288)



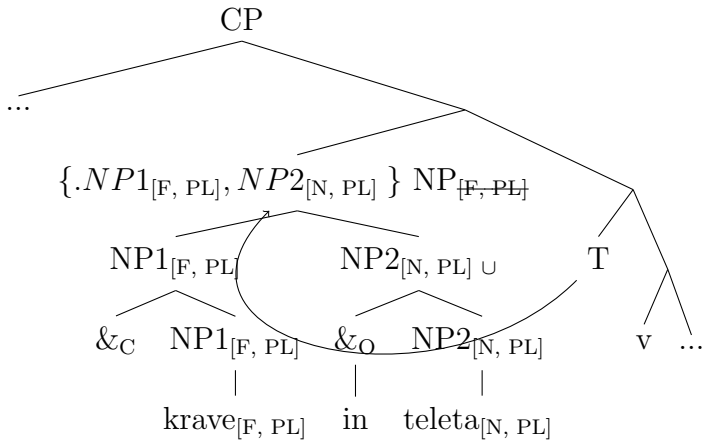
Then T agrees with the coordinate subject. This results in deactivation of resolved phi features. Note that in this case, case deactivation does not have consequences on how FCA is valued. This is a major difference between my proposal and Bhatt and Walkow's.

(289)



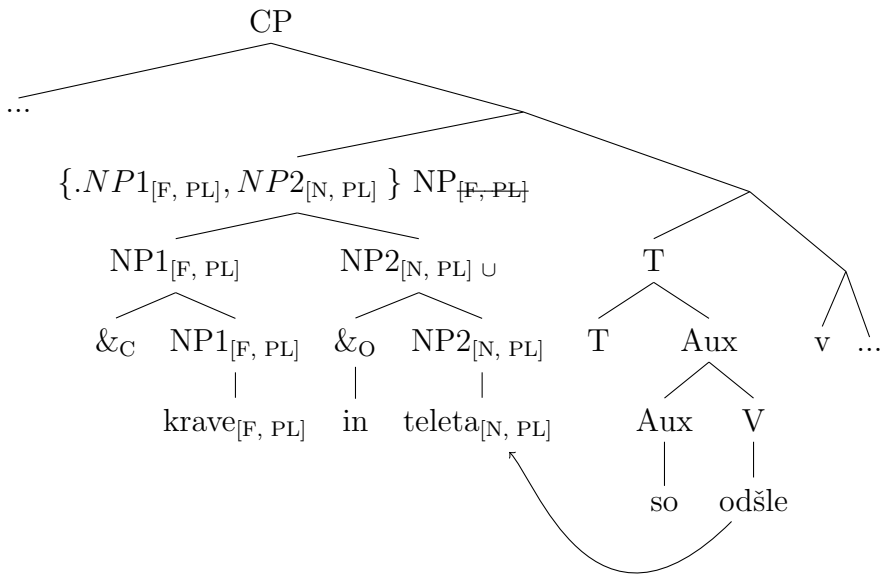
Now consider LCA case in (287b). Here the subject precedes the Aux and the verb, so I assume it is in Spec-TP. The coordinate complex is built and merged into the derivation in Spec-TP. Then T is merged. Under Phase Command, T agrees with the coordinate subject, resulting in deactivation of the phi features of the coordinate.

(290)



Now, V probes for phi features in its Phase Command domain. What V probes for is some phi features. V does not resort to the closest conjunct because resolved features are not available. It just agrees with the *closest* phi features available. By the definition of linear closeness in (281), the closest conjunct is the last one, *teleta*. The constituents intervening between the verb and the last conjunct are a proper subset of the constituents intervening between the verb and the first conjunct.

(291)



3.4.3 FCA and LCA in Hindi Urdu

Now I will show how my analysis derives FCA and LCA in Hindi-Urdu. In Hindi-Urdu, conjunct agreement occurs with objects. Agreement with subjects is always resolved because the agreeing head, T, is also the one that checks the subject's Case. I will focus on agreement with objects. In such cases, when the verb precedes the coordinate, FCA applies, and when it follows the coordinate, LCA occurs.

(292) FCA

a. us-ne kharid-ii kursii aur sofa
he-ERG buy-PERF-F.SG chair.F.SG and sofa.M.SG
'He bought the chair and the sofa.' (Benmamoun et al. 2009, 77, abbreviated)

b. Mona-ne bazaar-me dekh-aa th-aa ek ghoṛaa
Mona-ERG bazaar-in see.PERF-M.SG be.PST-M.SG a horse.M.SG
aur kai kutte
and many dogs.M.PL
'Mona had seen a horse and many dogs in the market.' (Bhatt and Walkow 2013, 960, (12b))

(293) LCA

Ram-ne ek thailii aur ek baksaa u'thaa-yaa
Ram-erg a bag.F and a box.M lift-PFV.M.SG

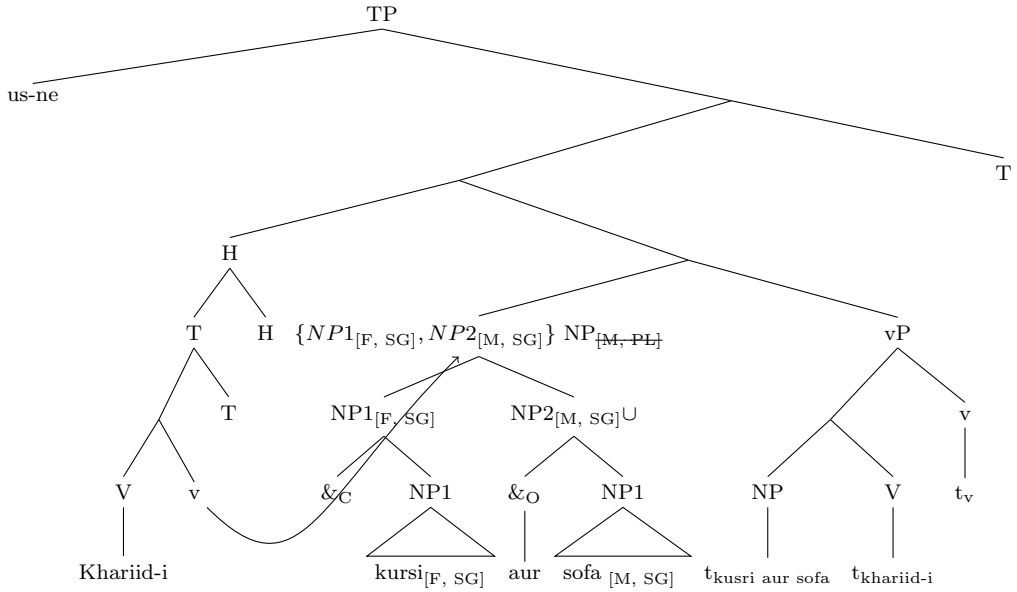
'Ram lifted a small bag and a box.' (Bhatt and Walkow 2013, 958, (8a))

I will start with FCA in (292a). Here, the word order is unusual for a head final language like Hindi. Hindi allows free order. I will not get into the details of what movements are involved to derive the word order, and will leave the nodes unspecified. What matters in my theory here is linear order. The constituents that are supposed to be right headed such as v, V and T must have moved from a right position to a left position. The derivation of the sentence proceeds as follows.

Assuming that the derivation runs from left to right, the CP phase is merged, and the T node is generated on the right. I should note here that although the node T has been inserted by the grammar, its value will not be filled in yet before the elements that precede it linearly have been merged into the derivation. This is what the left to right derivation requires. I assume that the V and v nodes are included as part of the verb that has moved to the left, and Agree from there. Again, the analysis I am proposing does not depend on a particular structural analysis. Being a case checking head, v may not agree with the coordinate complex before the coordinate is fully derived. Only agreement with the coordinate's topmost node guarantees case

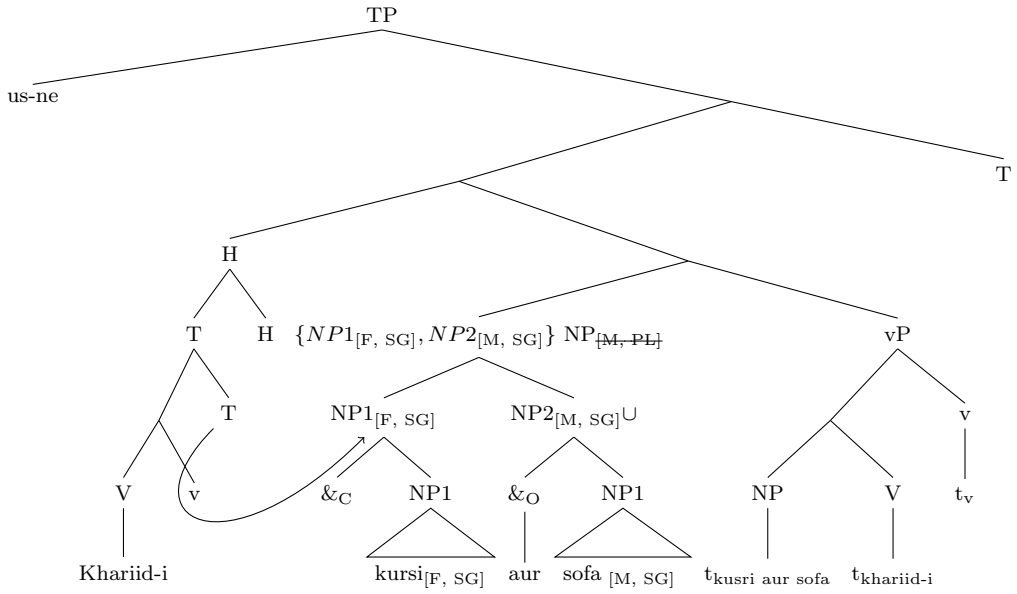
spreading (Walkow 2013). After the coordinate is fully constructed, v checks its case features, resulting in deactivation of resolved phi features.

(294)



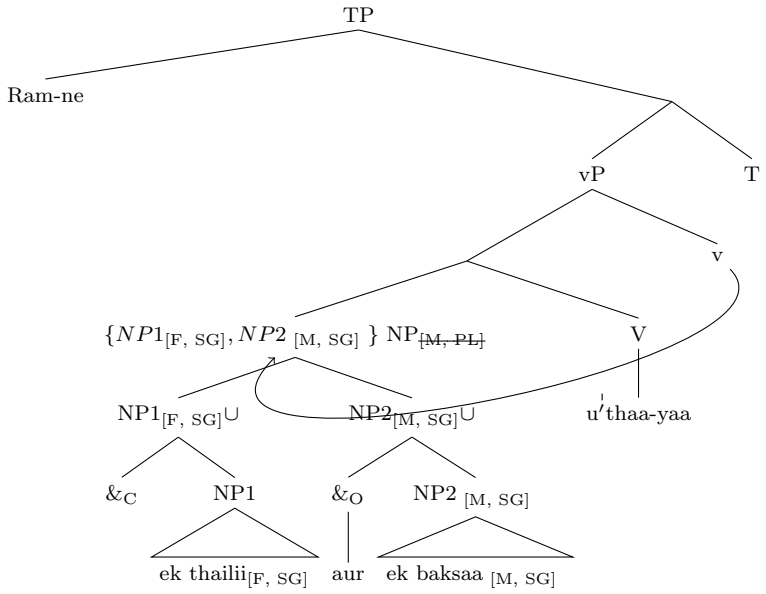
Since T is not a case-checking head, all what it requires is phi features. Thus it agrees with the linearly closest conjunct, here *kursi* because the features of the coordinate phrase as a whole have been deactivated.

(295)



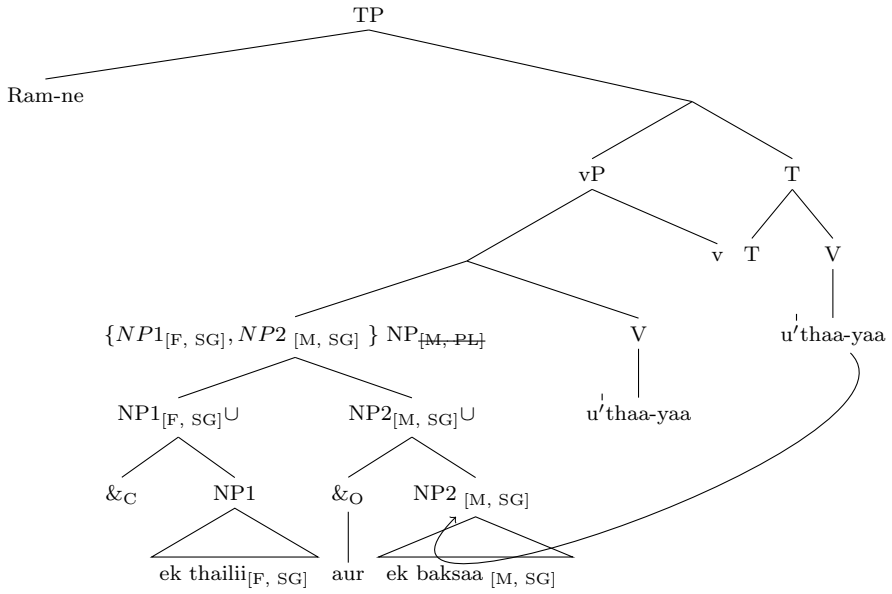
Now consider the LCA case in (293). Again, the derivation proceeds from left to right, so even if the higher nodes are projected by the syntax, their values are merged linearly from left to right. So the subject *Rina-ne* is merged, then the coordinate complex then V. Little v assigns Case to the coordinate object resulting in deactivation of phi features.

(296)



By the time V probes for phi features, it agrees with the closest constituent, here the last one, *ek baksaa*. The intervening constituents between the verb and the last conjunct are a proper subset of the constituents intervening between the verb and the initial conjunct.

(297)



Now I wish to account for agreement in cases such as (298). Here, an object is sandwiched between two verbs, and in this case, Benmamoun et al. (2009) and Bhatt and Walkow (2013) argue that bi-directional agreement occurs: the last conjunct agrees with the verb that follows the coordinate, and the first conjunct agrees with the verb that precedes the coordinate.

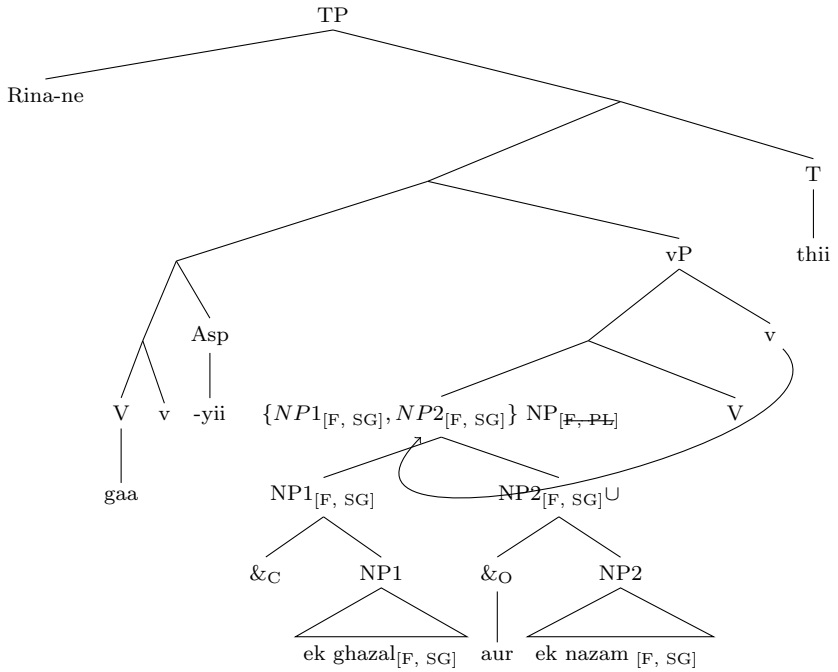
(298) Hindi-Urdu

Rina-ne gaa-yii ek ghazal aur ek nazam thii
Rina-ERG sing-PFV.F a ghazal.F and a nazam.F be.PST.F.SG

'Rina has sug a ghazal and a nazam.' (Bhatt and Walkow 2013, 962, (16a))

The derivation proceeds as follows. The structure is derived from left to right by merging the subject, then the moved complex functional head that contains the verb. Again little v is a case-checking head so it cannot agree with the coordinate before it is built completely. Then, v is able to check its phi features, resulting in feature deactivation.

(299)

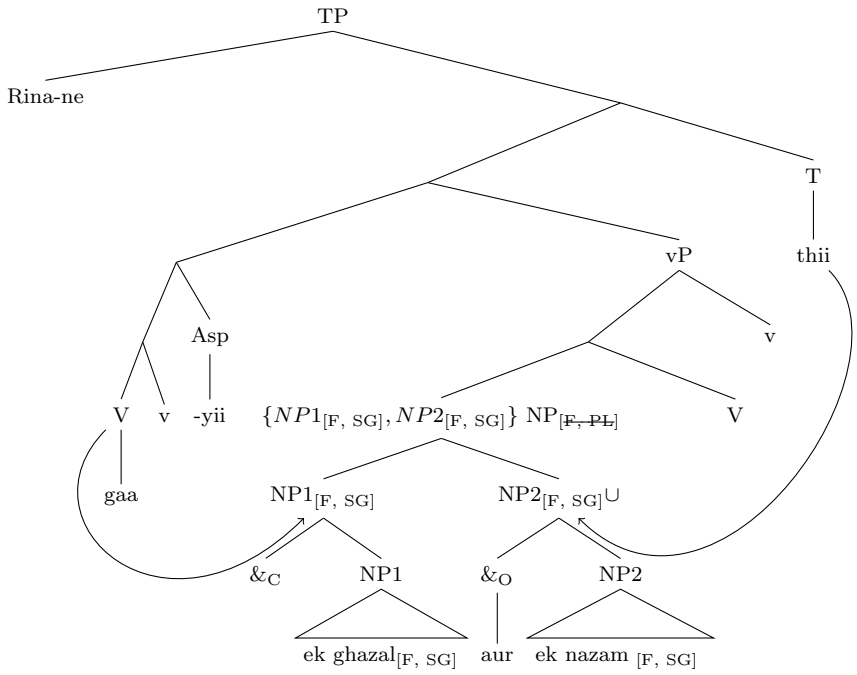


Now the verb *gaa-* does not check case, so it agrees with the closest constituent, here *ek ghazal*. The constituents that intervene between the verb and *ek ghazal* is a proper subset of the constituents that intervene between the verb and *ek nazam*. (Note that whether *gaa-* agrees prior to v's case assingment of the coordinate or after would not change the result of agreement. Since *gaa* is a non-case checking head, it will agree with the closest conjunct no matter what.)

The derivation proceeds from left to right by merging the verb *thii*. Similarly, all what this verb requires is agreeing with the closest consituent that has phi features available, which is the last conjunct, *ek nazam*. The set of intervening constituents between *ek nazam* and the verb is a proper subset of the set of intervening constituents between the verb and *ek ghazal*.[4]

[4] Cases of bidirectional agreement fail if the two conjuncts do not match. Bhatt and Walkow argue that this follows because the verb and T also have to Agree with each other. I adopt this analysis.

(300)



3.4.4 Indirect Conjunct Agreement in Modern Standard Arabic

Now I turn to Modern Standard Arabic. Consider the examples in (301). When the word order is SVO, subject-verb agreement is full resolved agreement, while it is partial in VSO word order.

(301) Modern Standard Arabic

a. qadam-at at-tilmiið-ah wa at-tilmiið al-imtiħan
take-3F.SG the-student.F.SG and the-student-M.SG the-test
'The student (female) and student (male) took the test.'

b. at-tilmiið-ah wa at-tilmiið
the-student.F.SG and the-student-M.SG
qadam-{$*\emptyset$/ $*at/aa$} al-imtiħan
take-{$*3M.SG$/ $*3F.SG/3M.DU$} the-test

Facts from Arabic show that the contrast in agreement above is not specific to coordination, but holds with plural subjects generally. In Modern Standard Arabic, in VSO word order, agreement is always singular regardless of the number of the thematic subject. However, person and gender agreement features on the verb are identical to

the closest conjunct's features, or the features of the plural NP if it is not a coordinate phrase. The examples below show that in VSO word order, the verb agrees with the thematic subject in gender but number is singular.

(302) Modern Standard Arabic

a. ʔallaf- $\{\emptyset/*at/*u/*na\}$ al-muʕallim-un
write- $\{3M.SG/*3F.SG/*3M.PL/*3F.PL\}$ the-teacher-M.PL
riwayah
a.novel
'The teachers (Masc) wrote a novel.'

b. ʔallaf- $\{*\emptyset/at/*u/*na\}$ al-muʕallim-at riwayah
write- $\{*3M.SG/3F.SG/*3M.PL/*3F.PL\}$ the-teacher-F.PL a.novel
'The teachers (Fem) wrote a novel.'

So partial agreement in VSO word order is not specific to coordination as the examples above show. When the subject is a coordinate, the verb agrees with the first conjunct in person and gender, but not number.

(303) Modern Standard Arabic

qadam-$\{*\emptyset/at/*tu/*na\}$ al-banat w ʔana al-imtiħan
take-$\{3M.SG/3F.SG/*1SG/*1PL\}$ the-girls and 1SG the-test
'The girls and me took the test.'

Additional examples show that in a coordinate that has conjuncts mismatching in gender, the verb agrees with the first conjunct in gender but not number.

(304) a. M.SG & F.SG

qadam-$\{\emptyset/*at/*u/*n\}$ at-tilmiið wa
take-$\{3M.SG/*3F.SG/*3M.PL/*3F.PL\}$ the-student-M.SG and
at-tilmiið-ah al-imtiħan
the-student.F.SG the-test
'The student (male) and the student(female) took the test.'

b. M.PL & F.PL

qadam- $\{\emptyset/*at/*u/*n\}$ at-talamiið wa
take- $\{3M.SG/*3F.SG/*3M.PL/*3F.PL\}$ the-student.M.PL and
at-tilmiið-at al-imtiħan
the-student-F.PL the-test

c. F.SG &M.SG

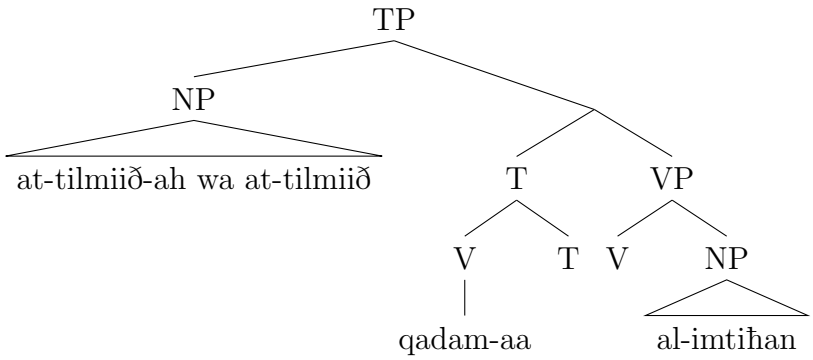
qadam-$\{*\emptyset/at/*u/*n\}$ at-tilmiið-ah wa
take-$\{3M.SG, 3F.SG, 3M.PL, 3F.PL\}$ the-student.F.SG and
at-tilmiið al-imtiħan
the-student-M.SG the-test

d. F.PL & M.PL

qadam-$\{*\emptyset/at/*u/*n\}$ at-tilmiið-at wa
take-$\{3M.SG/3F.SG/3M.PL/3F.PL\}$ the-student.F.PL and
at-talamiið al-imtiħan
the-student-M.PL the-test

To derive the distinction between SVO and VSO word orders in agreement, I propose that the word orders are derived from two different structures. SVO order in Arabic has the following structure.

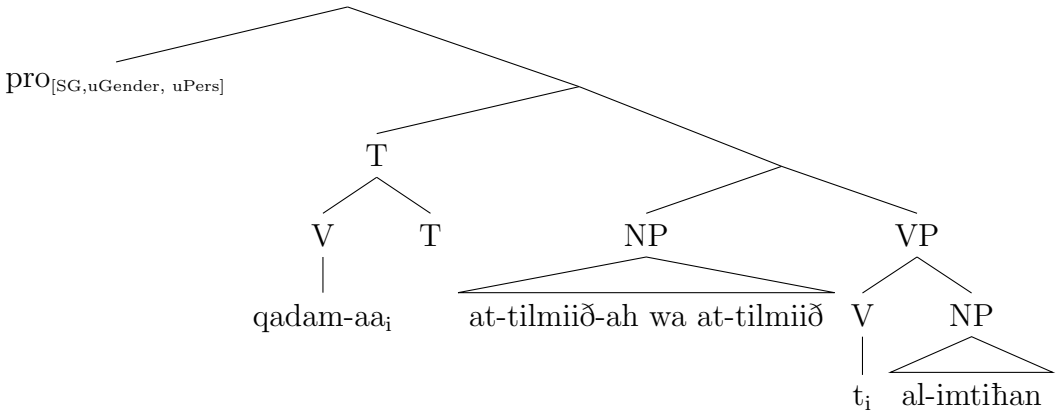
(305)



On the other hand, I assume that VSO order involves a null pronoun in spec-TP which is defective: it is valued for number but unvalued for gender and person. Pro gets its unvalued features via agreement with the thematic subject which occupies spec-VP. Pro here is similar to the English expletive *there* in that both are defective

(Chomsky 1995). In the case of English, *there* is valued for case and person, but is unvalued for number and gender. Here pro is valued for number (singular) but lacks gender and person values.

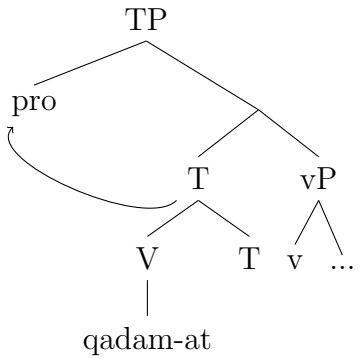
(306)



Thus, I propose that pro has its own singular feature but values its person and gender features from the first conjunct in the coordinate subject. I assume that agreement with pro occurs via V+T, that is agreement is regular full agreement between V+T and pro. However, pro cannot agree with a head before it has its unvalued features valued.

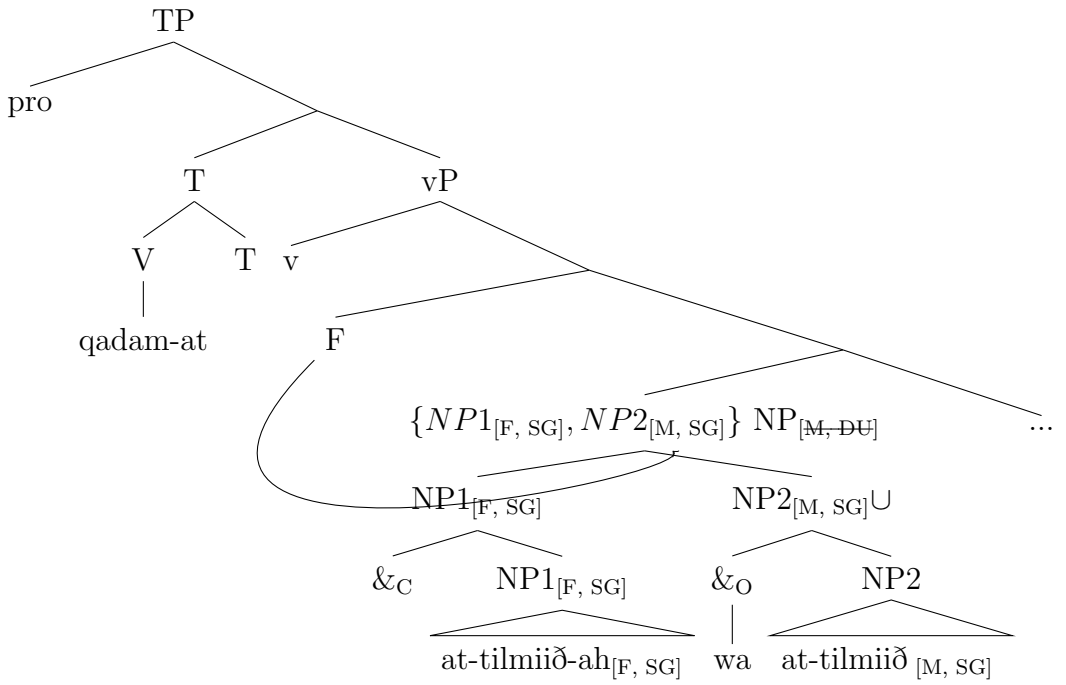
To show how my analysis derives (301a), first the structure is derived from left to right by merging the nodes, until phasal node vP is merged. Then, at that point, the heads, namely pro and T must value their features. Since pro does not have its phi features valued yet, it cannot enter into an agreement relation with T. Thus, under Phase Command, AGREE relation is established between T and pro, but is not valued until pro values its features.

(307)



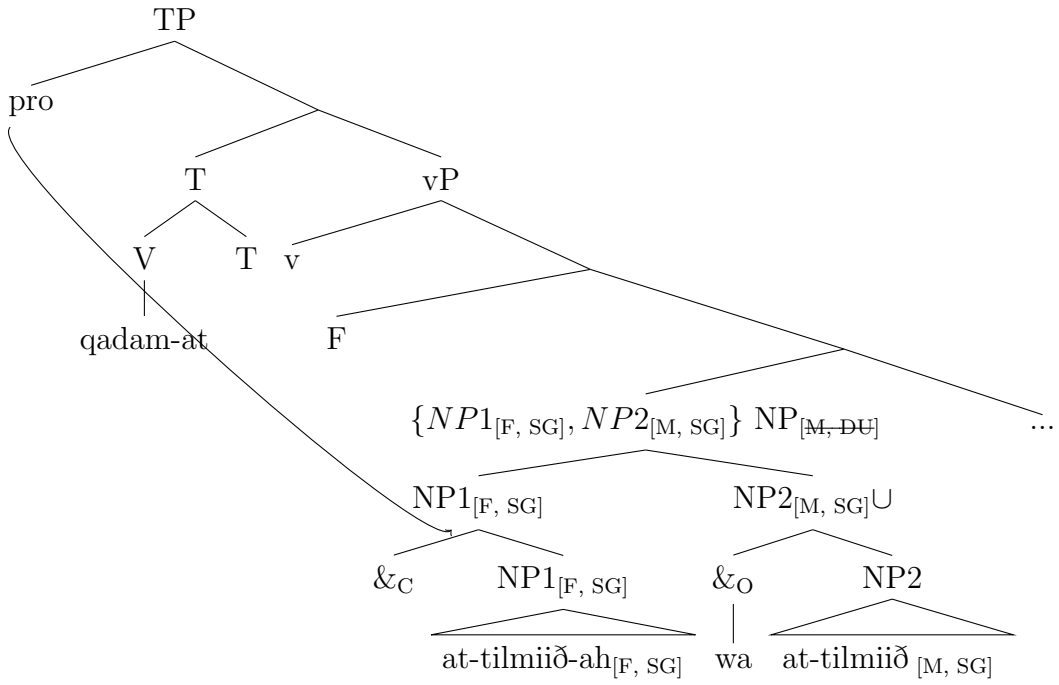
I hypothesize that when the coordinate complex is merged in a position somewhere to the right of the verb, its phi features are checked by some intermediate head, a functional head F, a closer head than pro. The role of the functional head is to license the coordinate complex by checking its Case. This results in deactivation of resolved features of the coordinate.

(308)



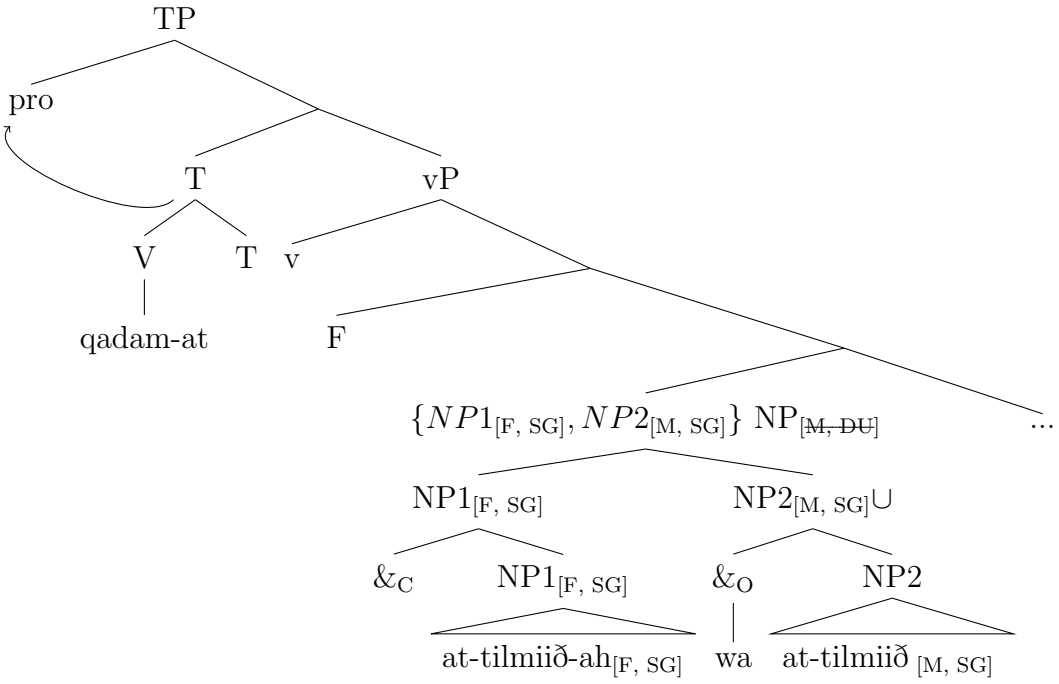
Pro is a non-case checking constituent, so it will agree with the closest nominal that has its phi features available, here the first conjunct *at-tilmiið-ah*.

(309)



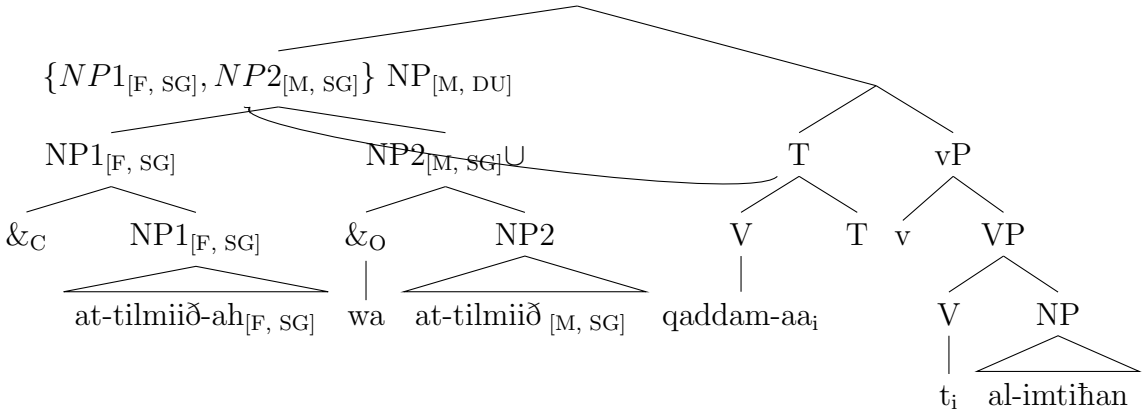
After phi features of pro are checked, it can now enter in an agreement relations with T, resulting in the partial agreement in VSO that we see.

(310)



In SVO word order, the coordinate subject is merged in spec-TP, now T is the head that both Case assigns and probes for phi agreement, resulting in resolved agreement. In other words, since T both Case assigns and probes for phi features, resolved agreement occurs. The verb values its features when it moves to T. I illustrate the agreement for (301b) below.

(311)



3.4.5 An Account of NSIs

Now consider the example reproduced below.

(312) Moroccan Arabic (Aoun et al. 1994, 211, (35))

a. ʕumar w Saʔid mšaw b-žuuž l-l-mədrasa
Omar and Said went.P with-both to-the-school
'Omar and Said went to school together.'

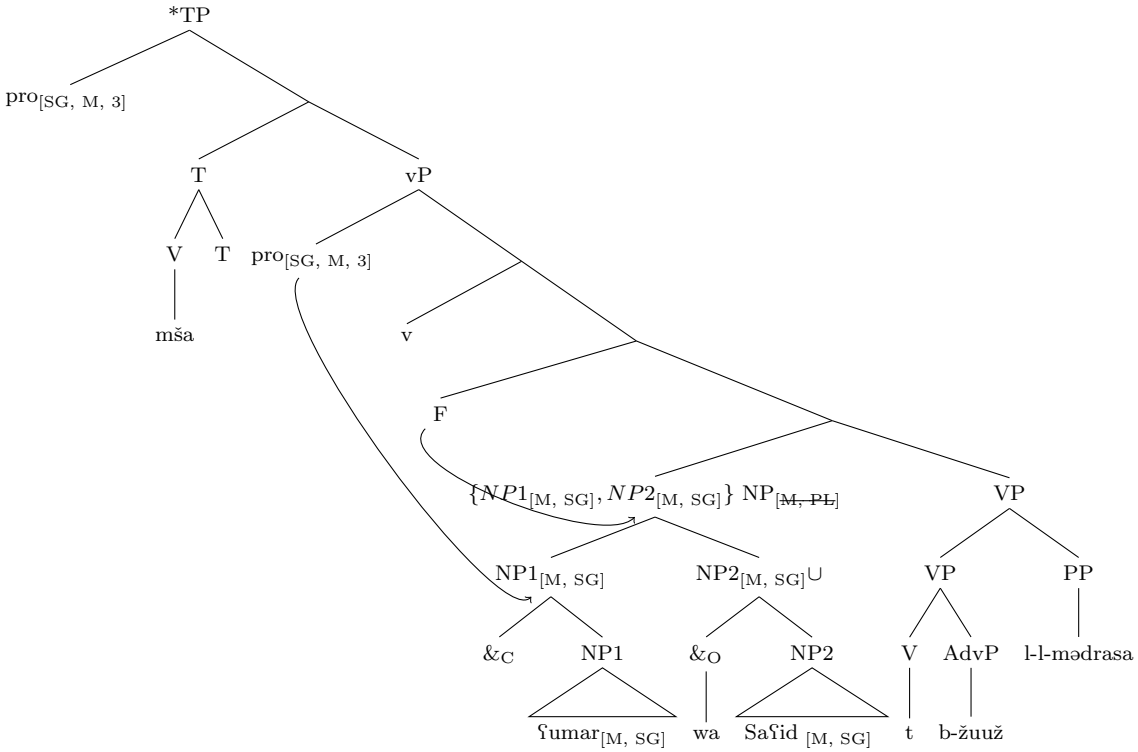
b. *mša ʕumar w Saʔid b-žuuž l-l-mədrasa
went.3MS Omar and Said with-both to-the-school

Aoun et al. (1994) argues that the number sensitive item (NSI), *b-žuuž* 'both' in (312) is unacceptable because the coordination here is clausal, and thus does not contain a coordinate NP with a plural number. Munn (1999) argues that the unacceptability of cases such as the one above is due to the fact that the NSI requires syntactic plurality, which cannot be available when conjunct agreement applies.

My analysis of the apparent conjunct agreement in Arabic explains Munn's proposal further. In my analysis, the NSI is ungrammatical with apparent conjunct

agreement cases such as in (312b) because the syntactic subject of the sentence is a defective pro that is only valued for number (singular). *b-žuuž* requires a syntactically plural subject, but pro is singular. I show the structure in (313). The coordinate complex's phi features are deactivated by a functional head, F as I assumed before. Pro, being a non-case checking head, agrees with the closest constituent that has its phi features available, in person and gender. Then, full agreement occurs between pro and the verb. The adverb *b-žuuž* requires a syntactically plural subject. Since pro is singular, the sentence is ungrammatical.

(313)



In contrast, NSIs that only require semantic plurality will be licensed, because the subject is semantically plural.

3.5 Summary

In this chapter, I have discussed agreement in the context of coordination. The chapter has two goals. First, it shows that agreement resolution is a strong motivation

for the Set Label condition I proposed in chapter 2. Agreement feature resolution via set union can be generalized to the way coordinates are labelled. Second, the discussion of closest conjunct agreement provided more evidence that linear order is of prime importance in syntactic phenomena. I have shown that, like selection, closest conjunct agreement can be captured in the syntax and this follows from how the structures are derived in my framework. Structures are put from left to right; FCA results from the assumption that non-case checking heads require to agree with a constituent with phi features as soon as possible. If the agreeing head follows the coordinate, then, in most cases, the resolved features have been deactivated, thus the only option is to agree with the final conjunct, which gives LCA cases. My proposal supports my thesis that linear order should be specified in the syntax. If linear phenomena can be specified in the syntax, there is no need to delay them to PF.

Chapter 4

ISSUES IN EXTRACTION

Ross (1967) introduces the Coordinate Structure constraint, a constraint that restricts movement from a coordinate, as defined in (314).

(314) (Ross 1967, 89)

"In a coordination structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct."

Grosu (1981) divides the CSC into two parts. The first part is called the Conjunct Constraint (CC). The CC bans extracting a whole conjunct, as illustrated below.

(315) The Conjunct Constraint (Chaves 2012b, 469, (7))

a. *Who$_i$ did you see [_$_i$ and Tim]?

b. *Who$_i$ did you talk to [Kim and _$_i$]?

The second part of the CSC is referred to as the Element Constraint (EC). The EC bars moving an element out of the coordinate complex, as in (316).

(316) The Element Constraint

a. *What$_i$ did Kim [cook t_i for two hours and eat shrimps in four minutes]? (Chaves 2012b, 475, (19); modified)

b. *We went to see a movie which$_i$ [the critics praised *American Sniper*, but t_i was too violent for my taste]. (Chaves 2012b, 475, (21a); modified)

Many researchers have pointed out that the EC is in fact violable in many contexts (Williams 1977; Goodall 1987; Postal 1998; Levine 2001; Levine and Hukari 2006; Zhang 2010a; Chaves 2012b). Violations fall into two main types. The first type is when an element is extracted in an across-the-board (ATB) fashion as in (317).

(317) ATB (Chaves 2014, 835, (4c,d))

a. Setting aside illegal poaching for a moment, [how many sharks]$_{i}$ do you estimate [[t_{i} died naturally] and [t_{i} were killed recreationally]]?

b. The ships that [a U-boat destroyed t_{i} and a Kamikaze plane blew up t_{i}] were the Laconia and the Callaghan.

The second type is when an element is extracted from a single conjunct. It has been noted that the second type of violation is grammatical only in asymmetrical coordination (Lakoff 1986, among many others).

(318) Asymmetrical

a. Who$_{i}$ does [[Big Louie visit t_{i}] and [the whole gang goes nuts]]? (Culicover and Jackendoff 1997, 210, (40a))

b. What$_{i}$ does [[he mention t_{i}] and [she kicks him out of her office]]? (Culicover and Jackendoff 1997, 210, (40b))

c. [How many counterexamples]$_{i}$ can [[the Coordinate Structure Constraint sustain t_{i}] and [still be assumed]]? (Lakoff 1986)

d. Sam is not [the sort of guy]$_{i}$ [[you can just sit there], [listen to t_{i}], and [stay calm]]. (Lakoff 1986, (6))

Some researchers argue the CC can also be violated (Zhang 2010a; Yatabe 2003); Bošković 2009). Due to the above violations of the CSC, several analyses have been proposed to reduce the CSC to more general constraints (Munn 1993; Johannessen 1998; Merchant 2001, among others). In this chapter, I will also attempt to pin down the constraints that underlie the CSC. The chapter is divided into two main sections. In section 4.1, I will discuss the CC. Following Grosu (1981), Munn (1993), and Merchant (2001), I argue that the CC is not a constraint on movement but a constraint on pronunciation. In addition, I will argue that the CC is inviolable. I show that the examples where the CC is apparently violated are in fact comiatives. In section 4.2, I will propose that the EC should be eliminated from the grammar. Extraction from

a coordinate should be licit, all other things being equal (Chaves 2012b). However, I propose that in symmetric coordination element extraction must take place in an across-the-board (ATB) fashion due to semantic parallelism constraint (Fox 2000).

4.1 The Conjunct Constraint

4.1.1 Overview

It has long been assumed that the the CC is inviolable (Postal 1998). However, there have been recent claims that the CC may be violated in some contexts. One instance of violation occurs in languages in which a lexical item is ambiguous between a coordinator and a comitative marker. For example, Zhang (2010a) claims that Chinese *he/gen* coordinates may violate the CC in specific contexts. In (319a), Zhang proposes that *houche* is extracted out of the coordinate complex *[__gen qiche]* and raised to the subject position. A similar extraction occurs in (319b) with the verb *yinggai*. Following (McNally 1993), she dubs these constructions *comitative coordinates*.

(319) a. Huoche$_i$ hui [_$_i$ gen qiche] xiangzhuang ma?
train$_i$ might [_$_i$ and bus] collide Q
'Might the train collide with the bus?' (Zhang 2010a, 114, (4.81a))

b. Wo caixiang, Baoyu$_i$ yinggai [_$_i$ gen Daiyu] xia-zhe qi ne.
I guess Baoyu$_i$ should [_$_i$ and Daiyu] play-PRG chess PRT
'I guess, Baoyu should be playing chess with Daiyu (now).' (Zhang 2010b, 227, (85))

I claim that these types of examples are actually comitatives. I will argue that in a comitative, the first NP does not form a constituent with the second NP, and so the two can move independently. In contrast, in true coordination, conjunct extraction is always banned.

The section is organized as follows. Section 4.1.2 establishes that the CC is not a movement constraint. In Section 4.1.3, I show that comitatives have different structure from coordinates. In section 4.1.4, I argue against Zhang's analysis of comitative coordinates. Section 4.1.5 is a summary.

4.1.2 The CC as a Constraint on Pronunciation

I will adopt and defend the idea that the CC is a constraint on pronunciation. Conjuncts cannot be unpronounced (Grosu 1981; Munn 1993; Merchant 2001; Zhang 2010a). This constraint on pronunciation also rules out moving conjuncts since the site of the moved conjunct would be null. A constraint banning an unpronounced conjunct will also ban moving a conjunct. In this section, I review evidence in favor of this analysis.

Merchant (2001) argues that the CC is a PF constraint, along the lines of the Null Conjunct Constraint, proposed by Grosu (1981), which states that conjuncts may not be null. Merchant provides various examples from phenomena that exhibit a ban on deletion at PF, in which coordinating a null element and an overt element is barred. Cases where a conjunct is null but has not undergone movement are ungrammatical.

The first example comes from VP ellipsis. In cases of VP ellipsis, it is ungrammatical to coordinate a null VP with an overt VP (Grosu 1973). There is no movement here, so a constraint on movement would not rule this out. We need a constraint against null conjuncts, and that constraint will also capture the movement cases. As pointed out by Merchant, one explanation for the ungrammaticality of sentences such as (320) is that a conjunct cannot be null.

(320) *I couldn't lift this weight but I know a boy who could both [_ and lift a crowbar, too]. (Grosu 1973, (53); modified)

Similar facts are found in Right Node Raising (RNR). In many analyses, RNR is analyzed as PF deletion. The ungrammaticality of (321), then, must be due to a ban on leaving a conjunct unpronounced.[1]

(321) *[[Tom is writing an article on Aristotle and _], [and Elaine has just published a monograph on Mesmer and _]] , Freud. (McCawley 1988)

[1] In many analyses, RNR is derived by movement. See Sabbagh (2007). For more recent perspectives on RNR, see Chaves (2014), Larson (2015), and the cited work therein.

Another argument for the non-movement analysis of the CC comes from Greek null subjects. Greek allows null subject (a pro), but if the subject is a conjunct phrase, one of the conjuncts may not be a pro. Since clearly no movement occurs here, the ungrammaticality must be due to a constraint that bans a null conjunct.[2]

(322) (Merchant 2001, 197, (103))

{*Afros*/ ∗*pro*} kai o Pavlos ine adherfia
he/pro and the Paul are siblings
'He and Paul are siblings.'

a. {*Esi*/ ∗*pro*} kai o pavlos iste adherfia
you.sg/pro and the Paul are siblings
'You and Paul are siblings.'

An argument which I wish to add comes from pied-piping. Pied-piping is known to ameliorate island violations (Cable 2010). If moving a conjunct constitutes an island

[2] In some languages, dropping a conjunct seems to be allowed, in a construction known as Verb Coded Coordination (Schwartz 1988). In this construction, the first conjunct is dropped, and a plural or dual morpheme that encodes the coordination appears on the verb. In particular, the morpheme refers to the missing conjunct, but encodes the plural or dual number of the combination. (Irish is also a language which shows this pattern. See McCloskey (1986).)

(1) (Tak and Botne 1998, 49, (4))

a. Hausa (Afroasiatic)
Mun jee kaasuwaa da k'aneenaa.
1P-PST go market and younger.brother.1POSS
'My younger brother and I went to the market.'

b. Yapese (E. Oceanic)
ka ra Pow Tamag.
ASP 3DU come-DU Tamag
'He and Tamag came.'

One way to analyze these cases is to assume that the missing conjunct is implicit, that is it is not syntactically projected. I hypothesize that this is licensed by the morphology that appears on the verb. If the missing conjunct is not present in the syntax, the CC is not violated. The CC in my framework bans leaving a set member unrealized. If the set memeber simply does not exist, then the constraint is not violated.

violation (a movement violation), we predict that pied-piping the whole conjunct will make the sentence grammatical. This prediction is not borne out, as shown in (323b). Pied piping the coordinate complex when a single conjunct is a wh-word appears to be banned.

(323) a. * The man who$_{i}$ they are going to meet [_ t_{i} and you] together is over there.

b. * The man [who and you]$_{i}$ they are going to meet t_{i} together is over there.

Similar restrictions have been noted in Postal (1972), and further discussed in Cable (2010), although for cases where the wh-word is an element within a conjunct. A single wh-word inside a conjunct cannot pied-pipe the whole conjunct. One explanation of the ungrammaticality of (324a) could be that it violates semantic parallelism (Safir 1984; Munn 1993; Fox 2000). Coordination seems to have a restriction on what conjuncts may be coordinated. Munn (1993) proposes that the restriction is semantic. Only similar semantic types may be coordinated. Thus, the ungrammaticality here is due to a mismatch in semantic type. (See section 4.2.1)

(324) (Heck 2008, 55, (90))

a. * Whose paintings and John's books did you sell?

b. Whose paintings and whose books did you sell?

Another argument Merchant proposes which I believe equally argues for a movement and a non-movement analysis comes from resumption. Merchant claims that resumption can ameliorate the effects of the CC in English (Merchant 2001; Pesetsky 1998). In (325), the pronoun *him* that is coindexed with the extracted conjunct *the guy* makes the sentence acceptable.

(325) a. That's the guy$_{i}$ that they were going to meet [you and him$_{i}$] together.

b. Which wine$_{i}$ would you never serve [it$_{i}$ and sushi] together? (Petesky 1998a:366 n. 28)

However, this constitutes does not seem a strong argument. Resumption is a strategy that ameliorates movement violations as well. For instance in (326), the island violation can be fixed by inserting the resumptive pronoun *it*. Resumptive pronouns are consistent with both a PF constraint and the view that the CC is a constraint on movement.

(326) This is the thing that I was wondering if you want it.

Although this argument does not go through, there is strong evidence against the analysis that the CC is a movement constraint and for the analysis that it is a constraint on pronunciation. As I have shown, facts from VP ellipsis, null pro, and pied-piping argue for treating the CC as a constraint on pronunciation. I adopt this analysis and argue that this pronunciation constraint cannot be violated.

In section 2.3, I argued that conjuncts are on par in terms of constituency. A coordinator is adjoined to every conjunct, and Set Label is triggered upon the merge of the coordinate initial coordinator. The result is a set of the the labels of the conjuncts. The way I define the CC as a constraint on pronunciation in my framework is as follows. Given the assumption that the label of a coordinate is a set of the labels of the conjuncts, the can be defined as below:

(327) Members in a set label cannot be phonologically null.

I assume that this pronunciation constraint is also violated when a conjunct is extracted. Under extraction, the lowest copy is (typically) not pronounced, leading to a violation of the constraint.

4.1.3 Comitatives vs Coordinates

In this section, I will discuss the syntactic and semantic differences between a comitative and a coordinate. On the basis of these differences, I propose that comitatives can have two possible structures, neither of which involves a complex NP. The

first NP does not form a constituent with the second, and so can be extracted independently. (Throughout the discussion, I will refer to the NP that precedes the comitative marker NP1 and the NP that follows the comitative marker NP2.)

It is important to draw a distinction between comitative and coordinate constructions. This distinction becomes crucial in languages that encode coordinates and comitatives using the same lexical item. In English, comitative phrases involve the preposition *with*, contrasting with the coordinator *and* (Lakoff and Peters 1966; Kayne 1994; Stolz 2001). On the other hand, in many languages a single lexical item is ambiguous between a coordinator and a comitative marker like in Arabic, Russian, and many other languages.

4.1.3.1 Syntactic and Semantic Differences

A number of facts show that in a comitative, NP1 and NP2 are not base generated in a complex NP. English comitatives allow NP1 to move independently of *with* NP2, as shown in (328).

(328) a. I ate pasta with meatballs.

b. Pasta is often eaten with meatballs.

In contrast, raising the first conjunct from a coordinate phrase is impossible:

(329) a. I ate pasta and meat balls.

b. *Pasta$_i$ is often eaten [_$_i$ and meatballs].

However, (329b) can be grammatical with a long pause before *and* and with emphasis on *and meatballs*. In this case, the coordinator and what follows might be analyzed as a remnant of ellipsis with clausal coordination.

(330) Pasta is often eaten, and meatballs [~~are often eaten~~].

The same contrast is found in wh-movement. *With* NP2 may be wh-moved, but *and* NP may not (McNally 1993; Zhang 2007).

(331) a. I mixed baking soda and vinegar.

b. I mixed baking soda with vinegar.

c. With what did you mix baking soda?

d. * And what did you mix baking soda?

Wh-movement can also strand *with* just like any other preposition, but this is not possible in coordination.

(332) a. What did you mix baking soda with?

b. * What did you mix baking soda and?

In addition, discontinuity is allowed in a comitative. Elements may intervene between NP1 and *with* NP2. In (333) *the liquid* is separated from the *with*-phrase by *carefully*. Coordination strictly disallows discontinuity.

(333) I mixed the liquid carefully with the unidentified compound I had found.

(334) *John met both his ex-wife in the park and his ex-girlfriend on the same day.

Comitatives and coordinates also differ semantically. One difference is that the nominals involved in coordination receive the same semantic role, while nominals in a comitative may or may not have the same thematic role. The semantic oddness in (335b) arises from the fact that in the coordinate *a monther and her baby* both conjuncts must have the same thematic role.

(335) a. A mother was cooking with her baby.

b. # A mother and her baby were cooking.

The second semantic difference is that iterativity is possible in coordination but impossible in comitatives (McNally 1993). In coordination, it is possible to have multiple conjuncts, all of which are parallel. This is not possible with comitatives.

(336) a. I and my friends and my colleagues had drinks.

b. I had drinks with my friends (*with my colleagues).

In coordination, iteration is more like listing, but in a comitative, iteration is addition of a *with*-PP to a single NP, but that single NP can be complex and can itself include a comitative. In (337a), the relevant reading is as a list, where three items are equivalent on that list. This is never possible with comitatives. In (337b), *pasta with meatballs* is a single NP, which refers to a single dish, that is accompanied with hot peppers. The reading which is disallowed: I ate a dish of pasta, and the pasta was accompanied by meatballs and by hot peppers.

(337) a. I ate [[pasta with meatballs] with hot peppers].

b. I ate pasta and meatballs and salad.

Another major difference is related to distributivity. It has been assumed that comitatives do not allow distributive reading while coordinates do (McNally 1993; Dalrymple et al. 1998). Although this descriptive generalization needs to be explained, I leave this issue aside and assume that the generalization is correct.

(338) a. * A woman together with her son each bought a book.

b. [A woman and her son] each bought a book .

The above differences show that comitatives and coordinates appear to be two different constructions. On the basis of these differences, I propose that comitatives and coordinates should also be different in structure.

4.1.3.2 Comitative Structure

Yamada (2010) points out that there are three types of comitatives as exemplified below.

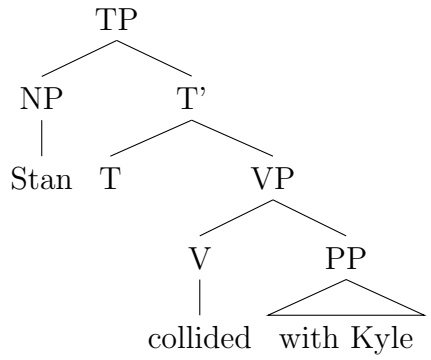
(339) a. Stan collided with Kyle.

b. Stan built a raft with Kyle.

c. Shelly cooked with her baby (Yamada 2010, 126, (177))

I propose that those three types have two distinct syntactic structures. I will assume that in (339a) the comitative PP *with*-Kyle is an argument. The verb *collide* requires this phrase as complement, so the *with*-phrase is a part of the selectional requirements of the verb. On the basis of this assumption, I propose the structure (340) for (339a).

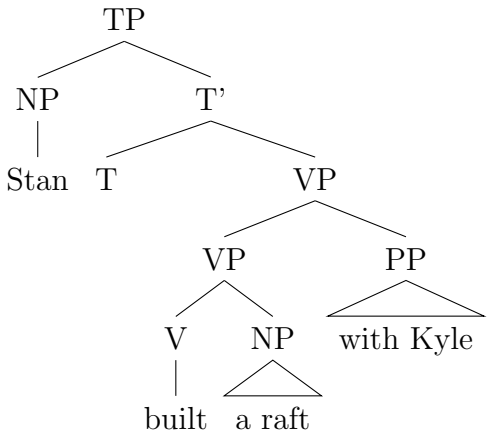
(340)



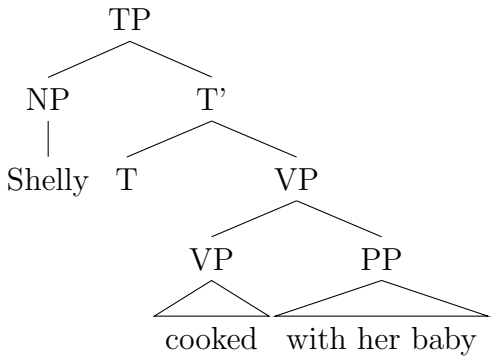
In (339b) and (339c), I will assume that the PP *with+NP* functions as a VP adjunct. The PP is optional and does not hold a thematic relation with the verb. I illustrate the structures below.

(341)

a.

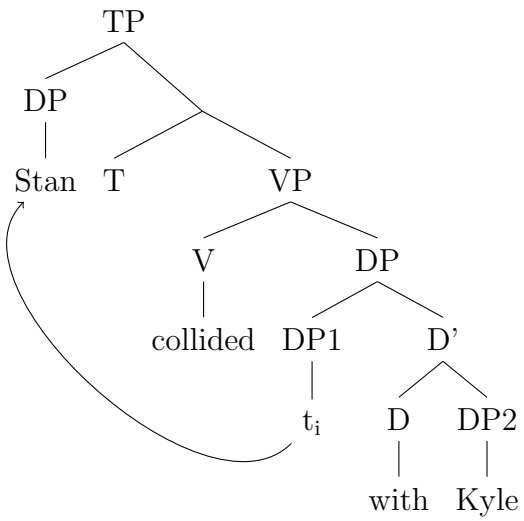


b.



Many analyses of comitatives assumed that comitatives are parallel to coordinates in structure. Following Kayne (1994), Zhang (2007) proposes that a comitative involves a complex nominal that contains NP1 and NP2. In Zhang's analysis, a sentence such as (339) is derived by movement of *Stan* out of a complex subject, *stan with Kyle*, as illustrated below.

(342)



I argue that the structure above cannot be right. First, the arguments presented in favor of this structure are weak. One argument comes from cases such as (343). Kayne (1994) argues that the use of the plural *friends* indicates that *he* and *harry* must have been base generated in a complex nominal.

(343) He is friends with Harry.

However, I believe the analysis of *friends* here is wrong. Other relational nouns such as *enemies*, may not occur in a similar construction. The use of the plural *with friends* here is exceptional and only occurs with this one noun. Even the use of the blend *frenemies*, which includes *friend* in it is unacceptable.

(344) * John is enemies/siblings/colleagues/brothers with Bill.

(345) * Sarah is frenemies with Sally.

Another argument in favor of a coordinate structure of comitatives proposed in Zhang (2007). Zhang shows that the complex *NP1 with NP2* may not undergo A-bar movement, as in (346). She claims that this shows that NP1 and NP2 are base generated in a complex NP.

(346) (Zhang 2007, 148, (35a,b))

a. *The apple with the orange, Mary compared.

b. *Which apple with the orange did Mary compare?

It is not clear how the impossibility of A-bar movement is relevant to whether an NP is complex or not. This actually shows that there is no such constituent. In Zhang's analysis, a comitative and a coordinate have a similar structure and both involve a complex NP. However, a coordinate may occur in a topic position. It can undergo A-bar movement. A comitative may not, as just shown. This is unexpected in an analysis which treats them as parallel.

(347) [The apple and the orange], Mary will compare.

Thus the arguments for the structure in (342) are invalid. Two arguments show that the structure in (340) capture the facts better. The first comes from VP topicalization. In (348), the PP *with the truck* may be moved in VP topicalization. This shows that they PP and the V form a constituent.

(348) Mary thought she would collide with the truck, and collide with the truck she did.

The PP cannot be an adjunct here because it may not be stranded as shown below. This shows that the PP is an argument of the verb, supporting to the structure I have proposed in (340).

(349) ?? Mary thought she would collide with something, and collide she did with the truck.

The second comes from VP ellipsis. In (350), the *with-PP* must be included in VP ellipsis (350b) and may not be stranded (350c). This shows that it is an argument of the verb. In contrast, in (351), *with*-PP is more like an adjunct because it may be stranded with VP ellipsis .

(350) a. Mary compared the blue apple with the red one.

b. ... and Bill did too.

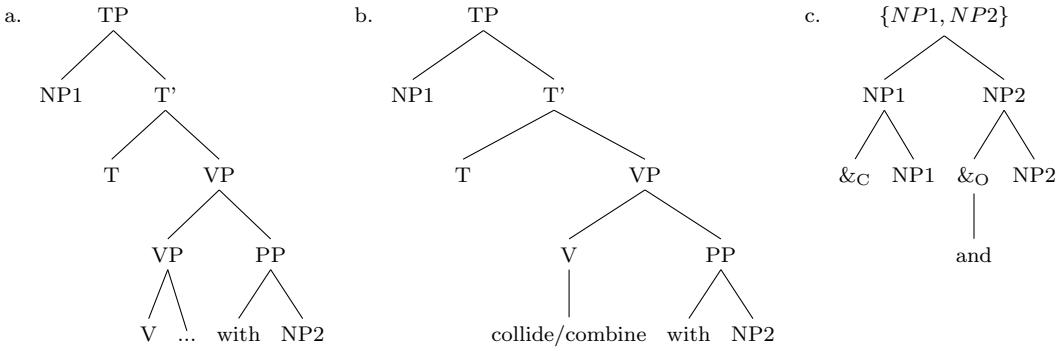
c. * ... and Bill did with the green one.

(351) Stand built a raft with Kyle, and Mary did with Sally.

All of this shows that *with NP2* is a PP that does not form a constituent with NP1. This contrasts with coordination, where the two NPs *do* form a constituent.

To wrap up, I have discussed some of the differences between a comitative and a coordinate. I proposed that comitatives can have two possible structures, as schematized in (352a,b). It is obvious that NP1 can move because it is structurally independent of NP2 and is not part of a complex NP. In contrast, in the coordinate structure in (352c), neither NP1 nor NP2 can move because they are embedded in a complex structure, a set. Moving or dropping a set member is banned by the CC. Conjuncts must be pronounced.

(352)



4.1.4 Comitative Coordinates in Chinese

Now I move to Zhang's proposal that the CC may be violated in Chinese *gen*-constructions, which she calls *comitative coordinates*. I will go over her arguments and critique them. Then, I conclude that the constructions which allow extraction are in fact true comitatives.

Zhang (2010b; 2010a) contends that the first conjunct can be extracted in coordination, while the second conjunct cannot. Thus she redefines the CC so that the CC should be split into two constraints: the CCe which bans extraction of the external conjunct, and the CCi which bans extraction of internal conjuncts.

(353) a. The CCe: extraction of the external conjunct (or the conjunct right before the coordinator) is not allowed.

b. The CCi: extraction of the internal conjunct (or rightmost) is not allowed.

However, for extraction to be possible, two conditions must be met. The first condition is related to the coordinator. The coordinator must have categorial features in order for the first conjunct to be allowed to move. The second condition is that the coordination must have a non-distributive reading.

Zhang contends that if the coordinator lacks categorial features, the first conjunct must transfer its features to the coordinator. These features will percolate up to the conjunction. This is Johannessen (1998)'s proposal for explaining why the first conjunct controls selection when category mismatch occurs. In (354a), Zhang claims that the coordinator *and* lacks category features and instead gets them from *my assistant*. The verb *depend on* requires a nominal argument. The conjunct phrase gets nominal features from the first conjunct via the coordinator. On the other hand, (354b) is ungrammatical because the feature that the clause provides to the coordinator do not satisfy the selectional restrictions of the verb.

(354) a. You can depend on [my assistant [and [that he will be on time]].

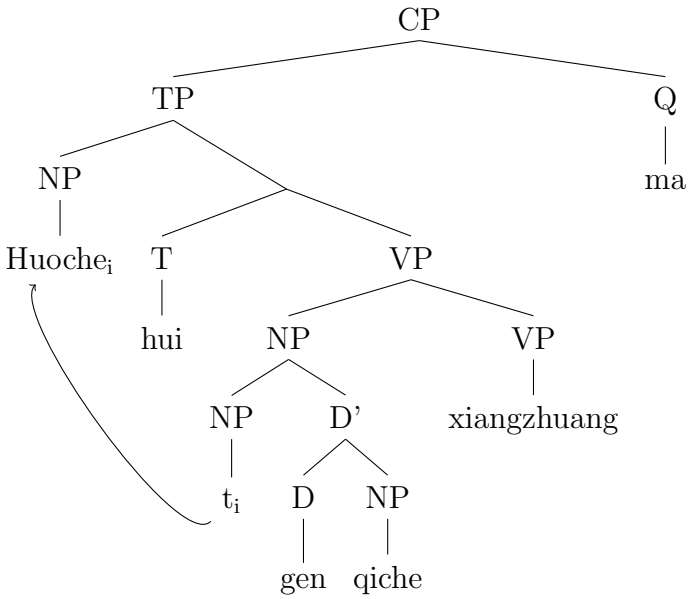
b. * You can depend on [that my assistant will be on time] [and [his discretion]].

When the first conjunct transfers its categorial features to the coordinator, it will not be able to move, assuming that movement is triggered by feature checking. So, *and* always lacks features in English and always gets its features from the first conjunct. (The analysis stipulates that the second can never be extracted. The second one should have features and should be available for extraction.)

Zhang argues that coordination with *he/gen* allows the first conjunct to move because the coordinator possesses categorial features. Consider (355). Here Zhang argues that the first conjunct is allowed to move because it did not transfer its features to the coordinator. One argument for this analysis is that these coordinators c-select their conjuncts, so they must have intrinsic categorial features. (See section 2.3.) I show Zhang's movement analysis for (355) in (356).

(355) Huoche hui [_ gen qiche] xiangzhuang ma?
train might [_ and bus] collide Q
'Might the train collide with the bus?'

(356)



However, extraction from *gen*-constructions is restricted. It applies only when the construction gives rise to a non-distributive reading. Zhang notes that *he/gen*

complexes give rise to two interpretations. Example (357a) has a distributive reading, as shown by its ability to license distributive adverbs like *ge* 'each'. On the other hand, complexes like in (357b) give rise to comitative or non-distributive interpretation. They allow collective adverbs such as *yi liang* 'together'. Zhang proposes that the extraction as in (355) is only possible when *gen* construction gives a non-distributive meaning. I assume this is based on an observation, which is that splitting the NPs is incompatible with distributive adverbs.

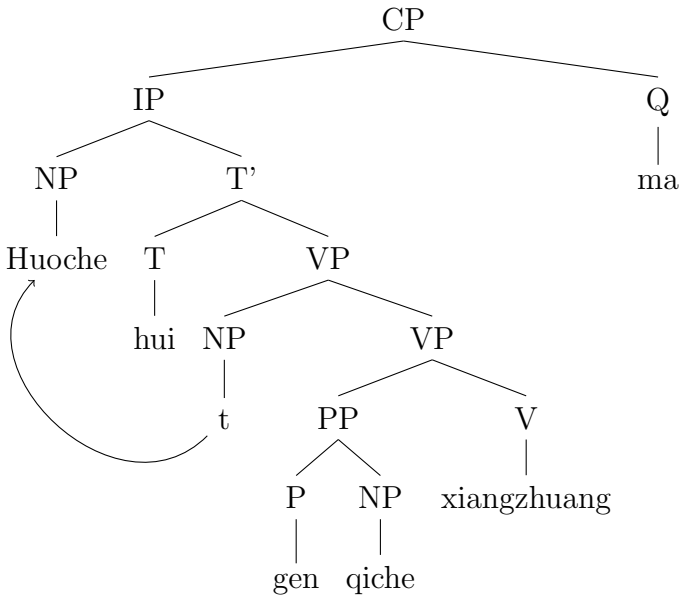
(357) a. Baoyu *he/gen* Daiyu ge mai-le yi liang che.
Baoyu *he/gen* Daiyu each buy-PRF one CLF car
Baoyu and Daiyu each bought a car. (Zhang 2010b, 221, (75))

b. Baoyu *he/gen* Daiyu he-mai-le yi liang che
Baoyu *he/gen* Daiyu co-buy-PRF one CLF car
Baoyu and Daiyu bought a car together. (Zhang 2010b, 221, (76a))

I argue that what Zhang characterizes as a comitative coordinate is in fact a comitative. *Gen* is ambiguous between a coordinator and a comitative marker. When *gen* occurs as a true coordinator, extraction is impossible. When it occurs as a comitative marker, NP1 behaves independently of NP2.

For instance, in the case at hand in (355), it is clear that *gen qiche* holds a thematic relation to the verb *xiangzhuang* 'collide' because it is obligatory. Thus, it must be a complement of the verb 'collide'. Thus the structure should be as in (358). *Huoche* should be allowed to move with no restrictions because it is not base generated in a complex NP.

(358)



To further support my argument that *he/gen* +NP is a comitative phrase (PP), I checked whether the phrase can iterate. The prediction is that if it is a comitative, then iteration is not possible without change of meaning (McNally 1993; Zhang 2010a). This prediction is borne out, as shown below.

(359) *Huoche hui gen gongjiaoche gen qiche xiangzhuang ma?
train might and bus with car collide Q
The intended meaning: '*The train might (have) collided with a bus with a car'

However, a native speaker indicates that when the second comitative marker is *he*, the sentence is grammatical. *He*+NP is possible as a second comitative combination. In (360), *bus and car* forms a subgroup, so the meaning is *train collided with [a bus and a car]*. It appears that *he* here functions as a true coordinator while *gen* is a comitative marker.

(360) Huoche hui gen gongjiaoche he qiche xiangzhuang ma?
train might and bus and car collide Q
'A train collided with [a bus and a car]"

Therefore, the inability of *gen*+NP to iterate shows that it is a comitative. In such cases, the NPs involved are not part of a complex NP and the structure is distinct from the coordinate structure.

In addition, if *he/gen* constructions are coordinates, the whole coordinate complex should be able to move to spec-TP in raising constructions. In fact, an NP complex that involves two occurrences of *gen* can move in a raising construction, but the interpretation here is more like true coordination according to a native speaker's interpretation. When all NPs raise, they function more like conjuncts that allow a distributive reading. The speaker reports that 'car', 'train' and 'bus' are moving in (361), while in (360), 'car' and 'train' can be stationary. This is not remarkable given that *gen* can be a true coordinator.

(361) [Huoche gen qiche gen gongjiaoche] hui xiangzhuang?
train and car and bus might collide
'a train, a car, and a bus might collide.'

In addition, Zhang's claim that extraction from gen constructions is possible only when it has non-distributive reading is stipulative. In my analysis, the fact that extraction is possible when *gen* constructions has a non-distributive reading follows from the fact that comitatives cannot give distributive readings as reported in McNally (1993) and Dalrymple and Kaplan (2000).

Thus, the facts above show that extraction of NP1 is possible only when *gen* occurs as a comitative marker. I have shown that comitatives have a structures that are different from coordinate structure; a comitative does not involve a complex NP, thus extraction of NP1 should be free. Therefore, Zhnag's distinction between initial and non-initial conjuncts in extraction is inadequate. No conjunct may be extracted in true coordination.

4.2 The Element Constraint

The EC bans extracting an element from a coordinate complex. Many researchers have noted that the EC can be violated in two contexts (Williams 1977;

Goodall 1987; Postal 1998; Levine 2001; Levine and Hukari 2006; Zhang 2010a; Chaves 2012b). The first context is when extraction occurs in an across-the-board (ATB) fashion, particularly in symmetrical coordination, as in (362). The second context is when an element is extracted from a single conjunct. This is only possible in asymmetrical coordination, as in (363).

(362) Symmetrical Coordination (Chaves 2012b, 487, (62))

a. [To him], Fred gave a football t_i and Kim gave a book t_i.

b. *[To him], Fred gave a football t_i and Kim gave me a book.

(363) Asymmetric Coordination:

a. How many counterexamples can [[the Coordinate Structure Constraint sustain t_i] and [still be assumed]]? (Lakoff 1986)

b. Sam is not the sort of guy [[you can just sit there], [listen to t_i], and [stay calm]]. (Lackoff 1986, (6))

Several analyses attempted to identify the constraints that underlie the EC (Williams 1977; Goodall 1987; Munn 1993; Johannessen 1998; Postal 1998; Levine 2001; Levine and Hukari 2006; Zhang 2010a; Chaves 2012b; Salzmann 2012, and many others). I propose that the only constraint that governs extraction from a coordinate is semantic parallelism (Safir 1984; Munn 1993; Fox 2000). This constraint applies to symmetric coordination, where conjuncts must be of the same semantic type. The analysis of ATB movement I adopt is a forking chains analysis couched in terms of a left-to-right derivational model.

4.2.1 The EC as a Semantic Parallelism Constraint

Empirical facts show that extraction from asymmetrical coordination is freely allowed by the grammar. Extraction is permitted from an initial conjunct, a non-initial conjunct, and all conjuncts simultaneously in an across-the-board fashion, as shown below.

(364) a. Who$_i$ did John [call the police and report that someone attacked t_i]?

b. Who$_i$ did Mary [say that she met t_i, and got a new job offer]?

c. Who$_i$ did Mary say that [she met t_i and had dinner with t_i]?

Most previous analyses explained the contrast between asymmetrical and symmetrical coordination by focusing on the asymmetrical coordination case. That is, they focused on explaining why the element constraint can be violated in asymmetric coordination (Johannessen 1998; Merchant 2001; Chaves 2012b; Weisser 2015). Few analyses explained the contrast by explaining why extraction from symmetrical coordination must be ATB (Munn 1993; Chaves 2012b). Chaves (2012b) argues that further pragmatic and semantic constraints are imposed on extraction out of symmetric coordination. He proposes a Relevance Condition, "A filler x must be pragmatically relevant/coherent in the event described by the sister phrase e."(Chaves 2012b, 490). According to this condition, in ATB extraction in symmetric coordination, a moved constituent should be relevant to both conjuncts in order for extraction to be licit. For instance, Chaves' analysis considers the extraction in (4.2.1) a violation of the relevance condition because *what* is irrelevant to the second conjunct; it cannot be a topic for the second conjunct.

(365) What$_i$ did [Mary read t_i and John buy a bestseller]?

However, the Relevance Condition does not seem to be the right analysis for why ATB is necessary in symmetric coordination. First, it does not seem to govern asymmetrical coordination, for instance. Chaves does not explain how extraction in asymmetric coordination avoids violating the Relevance Condition, given that he analyses asymmetric and symmetric coordination as having the same structure. The necessity of ATB movement cannot be simply explained by a general pragmatic account. Consider the following pair:

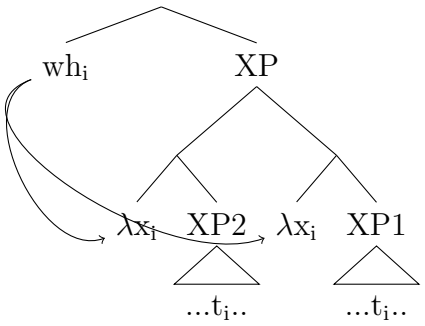
(366) a. * Who$_i$ did [Mary talk to t_i and John ignore someone else]?

b. Who is the person such that [Mary talked to that person and John ignored someone else]?

Sentences (366a) and (366b) are asking the same question, and so should be equally pragmatically infelicitous. This contrast shows that the constraint must be syntactic/semantic in nature, and not (wholly) pragmatic. Chaves' Relevance Condition is sort of mixed: pragmatic in invoking relevance, but syntactic in imposing the condition on specific filler-gap constructions.

In section 2.6, I argued that in symmetric coordination, all conjuncts must have the same semantic types. Following Munn (1993), I call this restriction Semantic Law of Coordination of Likes. As a result of this constraint on semantic types, when an element moves from a symmetric coordinate complex, lambda abstraction must apply to every conjunct in the complex. In other words, movement out of a symmetric coordinate is restricted by a semantic parallelism constraint. The schema for parallelism I propose is in (367). Movement abstracts over what is moved across, creating a derived predicate and thereby changing the semantic type. If the other conjuncts do not match this semantic type, semantic parallelism will be violated.

(367)



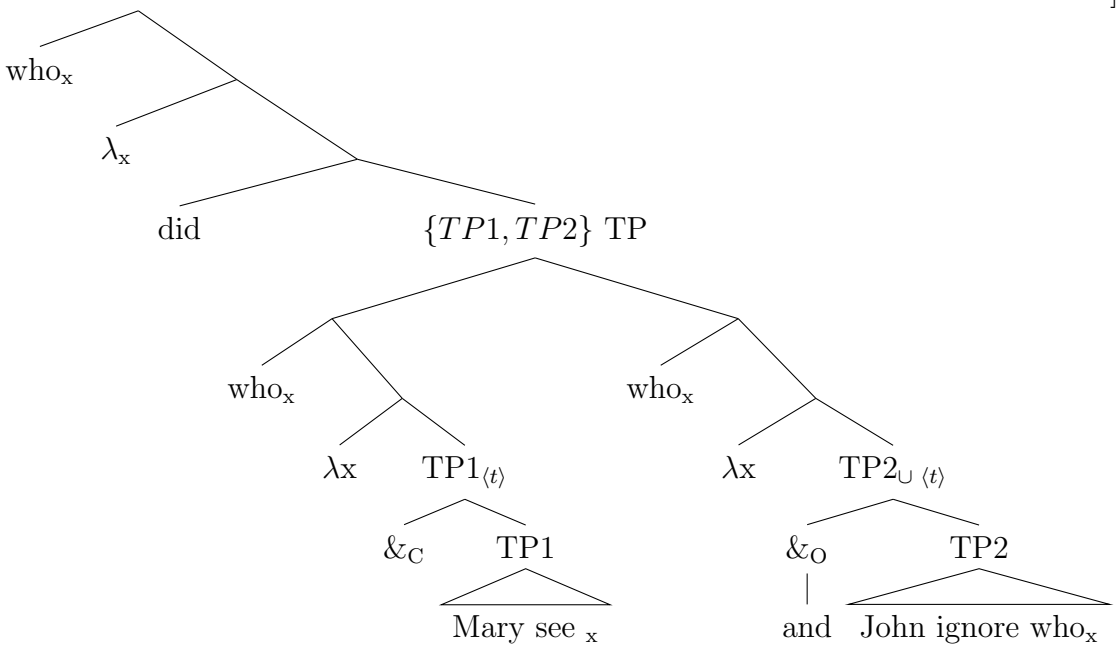
Now consider the ATB extraction below. The type of coordination here is symmetric. The semantic types of the conjuncts before extraction are $\langle t \rangle$ & $\langle t \rangle$.

(368) a. Who$_i$ did Mary see t_i and John ignore t_i?

b. [$_{< t >}$ Mary see x] and [$_{< t >}$ John ignore x].

The constraint that extraction from symmetric coordination must be ATB follows from semantic parallelism. If abstraction does not occur over all conjuncts, the derivation crashes. The way I capture this in my analysis is by forcing abstraction at the edges of the conjuncts. The derivation proceeds from left to right by merging copies of wh-phrases. When the abstraction reaches Set Label, abstraction is forced at the edge of the first conjunct, then the second conjunct, and so on. If abstraction does not occur at the edges of all conjuncts, the derivation crashes because this entails that the conjuncts mismatch in semantic type.

(369)



Thus, the constraint on element extraction out of coordinate reduces to a parallelism constraint which follows from a combanitorial restriction on semantic types in symmetric coordination. Only similar semantic types may be coordinated in symmetric coordination, and thus extraction must occur from every conjunct. Extraction from asymmetric coordination is unrestricted, precisely because the types do not have

to match. (See sections 2.5 and 2.7 for more on the distinction between symmetric and asymmetric coordination.)

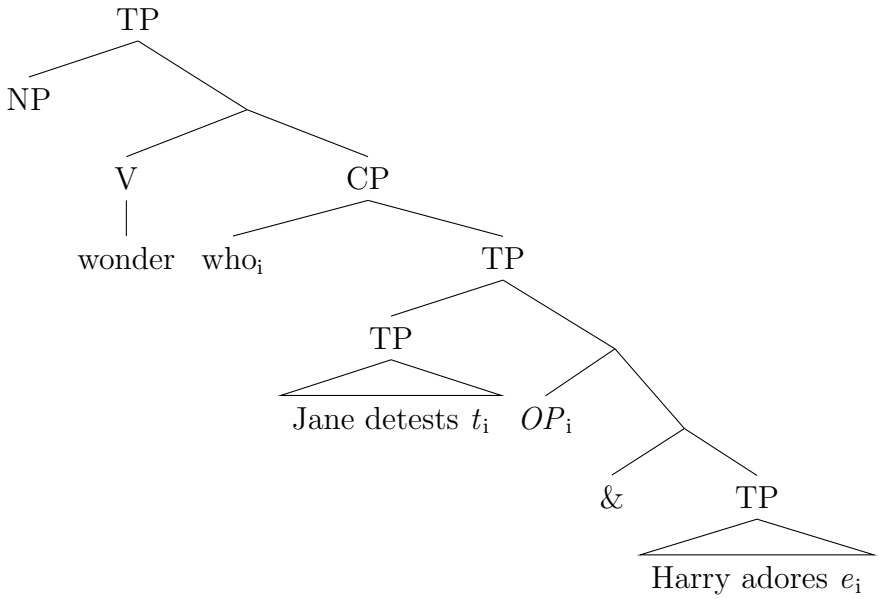
4.2.2 Linear Effects in ATB Movement

ATB movement was traditionally analyzed as involving movement from all conjuncts (Sabbagh 2007). The gaps in (4.2.2), for instance, were assumed to have been created through a forking chain, in which the gaps are simultaneously associated with the extracted *wh*-word.

(370) Who$_{\text{i}}$ did you say that [Lulu likes t_{i} and Tubby hates t_{i}]? (Zhang 2010a, (9.1a))

Munn (1993), Bošković and Franks (2000), Zhang (2010a), among others, contend that ATB gaps are not a result of movement from all conjuncts. Rather, extraction occurs from the initial conjunct, while the gaps in non-initial conjuncts contain a null element that is not a trace. One analysis that argues against a forking chains analysis of ATB movement is the Parasitic Gap (PG) analysis (Munn 1993; Franks 1995; Bošković and Franks 2000; Hartmann et al., *to appear*). The claim is that only the first conjunct involves extraction while the second conjunct has an operator that locally moves to the left periphery of the conjunct, as shown in (371).

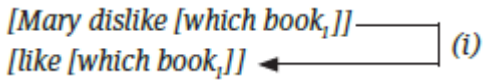
(371) (Bošković and Franks 2000, (37); adapted)



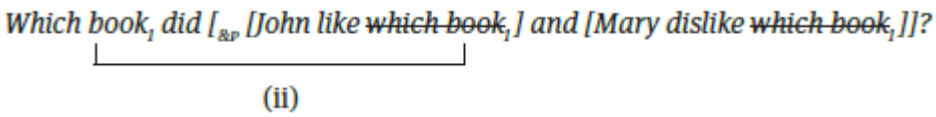
An analysis that is similar to the PG analysis in spirit is the Sideward Movement analysis (Nunes 2004). This analysis involves copying of the extracted constituent from one phrase marker to an unconnected phrase marker. Then at some stage, these phrase markers merge into one structure from which the ATB moved constituent is asymmetrically extracted, as shown in (373)-(374) for (372). As can be seen, the Sideward Movement analysis ends up with the same representation that the forking chains analysis has. ATB gaps contain an unpronounced copy of the extracted element.

(372) [Which book]$_{\text{i}}$ did [John like t_{i}] and [Mary dislike t_{i}]?

(373) (Salzmann 2012, 399, (4))



(374) (Salzmann 2012, 399, (5))



One criticism of the PG analysis is the fact that ATB movement can involve non-nominal elements, while true parasitic gaps are restricted to nominals (Cinque 1990; Postal 1993). Compare the examples below.

(375) PGs

a. *[How long]$_{\text{i}}$ does John drink t_i before lecturing pg_i?

b. This is [a topic]$_{\text{i}}$ you should think about t_i before talking about pg_i.

c. *This is a topic [about which]$_{\text{i}}$ you should think t_i before talking pg_i. (Postal 1993, 736, (3); adapted)

(376) ATB Gaps

a. [How long]$_{\text{i}}$ does it take John to write an article t_{i} and for Mary to write a monograph t_{i}?

b. This a topic [about which]$_{i}$ anyone should think deeply t_{i} and talk t_{i} seriously.

The arguments for the PG analysis come from a number of asymmetries between the gaps of ATB movement. Among the asymmetries is that the gaps are not equally sensitive to reconstruction and weak crossover (WCO) effects (Munn 1993, 2001). These asymmetries are also found in true parasitic gap constructions. Munn (2001) explains the asymmetries by arguing the non-initial ATB gaps are PGs. His analysis argues against a forking chains analysis of ATB movement.

Since Lasnik and Stowell (1991), it has been known that PGs do not show WCO effects, in contrast with the real gap, as shown in (377).

(377) (Munn 2001, 374, (9a,c))

a. Who$_{i}$ did you gossip about t_{i} despite his$_{i}$ mother's having vouched for pg_{i}?

b. * Who$_{i}$ did his$_{i}$ mother gossip about t_{i} despite you(r) having vouched for pg_{i}?

Munn (2001) shows that in ATB movement, unlike the initial gap, non-initial gaps, which he considers PGs, are insensitive to WCO, as in (378).

(378) (Munn 2001, 374, (11a,c))

a. Who$_{i}$ did [you gossip about t_{i} but his$_{i}$ mother vouch for pg_{i}?]

b. * Who$_{i}$ did [his$_{i}$ mother gossip about but you vouch for pg_{i}?]

In all the cases examined by Munn, the real gap precedes the parasitic gap. What he does not show are cases when the PG precedes the real gap. The facts show that in this case, WCO reverses, as in (379).

(379) a. * She is the kind of mother [that teachers who have to send her$_{i}$ child home to pg_{i}] always end up despising t_{i}.

b. She is the kind of mother [that teachers who meet pg_{i}] have no problem sending her$_{i}$ child home to t_{i}.

This is not as expected by the PG analysis of non-initial gaps in ATB movement, where asymmetries are due to the nature of PGs, since the asymmetries reverse when the PG occurs first. In Munn's analysis, WCO should be found with real gaps and not with PGs, regardless of order.

Another asymmetry between ATB gaps comes from reconstruction. A wh-phrase can reconstruct to the first conjunct for Condition A, but not to subsequent conjuncts:

(380) (Munn 1993, (52); adapted)

a. [Which picture of himself]$_{i}$ does John like t_{i} and Mary dislike t_{i}?

b. * [Which picture of himself]$_{i}$ did Mary paint t_{i} and John sell t_{i}?

However, the anaphor here is an exempt anaphor. An explanation of exempt anaphors is in order here. It has long been assumed that an anaphor is licensed in its local domain by a c-commanding antecedent (Chomsky 1986) or via co-argumenthood (Reinhart and Reuland 1993; Pollard and Sag 1994). However, there exist cases in which an anaphor is exempt from Condition A in English, like in picture-NPs. In this case, the anaphor does not require a local c-commanding antecedent.

(381) a. Serge$_{i}$ said that the rain had damaged pictures of himself$_{i}$. (Sportiche 2013, 200)

b. In her$_{i}$ opinion, physicists like herself$_{i}$ are rare. (Kuno 1987, adapted)

c. Max$_{i}$ boasted that the queen invited Lucie and himself$_{i}$ for a drink. (Reinhart and Reuland 1993, 670).

Recent work suggests that exempt anaphors are licensed by a closest perspective center (Charnavel and Sportiche, *to appear*). A perspective center can be intellectual, emotional or perceptual. In (381a), *himself* takes as its antecedent *Serge*, which as

the subject of the verb *say* is the closest intellectual perspective taker. *The rain* is a closer potential antecedent, but it is not a possible perspective taker. In (381b), the perspective center is emotional, namely empathetic (Oshima 2006). In (381c), the anaphor is licensed by a perceptual perspective center, also called deictic center.

Going back to reconstruction in ATB movement, in (380b), an alternative explanation of the facts is that *himself* is not licensed because the closest perspective taker to the surface position of the exempt anaphor is *Mary*, which does not match it in features. In (380a), in contrast, the closest perspective taker is a possible antecedent. Thus, on this alternative account, reconstruction asymmetries arise due to linear order, not the nature of the gaps involved.

The way to distinguish these two possible accounts of apparent Condition A reconstruction is to examine cases where the parasitic gap precedes the real gap. What we find is that in PG construction cases of true parasitic gaps, reconstruction effects reverse when the PG comes first. Again, this shows that the defining factor for the asymmetry between the ATB gaps is linear order.

(382) a. [How many portraits of herself]$_{\text{i}}$ did [the woman who commissioned pg_{i}] end up asking that artist to take t_{i} back?

b. ?? [How many portraits of himself]$_{\text{i}}$ did [the woman who commissioned pg_{i}] end up asking that artist to take t_{i} back?

In the analysis where reconstruction occurs to real gaps and not to parasitic gaps, (382a) should be ungrammatical and (382b) grammatical. The wh-phrase should reconstruct to the position marked t_{i}, where *that artist* should be able to serve as the antecedent for the anaphor. The wh-phrase should *not* be able to reconstruct to the PG position, and should be unable to take *the woman* (or relative operator associated with it) as its antecedent.

All of the cases so far have involved reflexives inside picture NPs, which are known to be exempt anaphors. If we try cases of argument anaphors, the judgments become unclear. Consider the examples below. Some speakers reject both (383a) and

(383b), while some find a contrast, with the closer antecedent more acceptable. It could be the case that these speakers allow vehicle change in the second conjunct, that is they reconstruct *himself* as *him* in the second conjunct.

(383) a. Criticize himself$_{\text{i}}$, [John will t_{i} but Mary won't t_{i}].

b. Criticize himself$_{\text{i}}$, [Mary will t_{i} but John won't t_{i}].

(384) a. ?? It is only himself$_{\text{i}}$ that [John has to blame t_{i} and Mary will gloat over t_{i}].

b. * It is only himself$_{\text{i}}$ that [Mary has to blame t_{i} and John will gloat over t_{i}.]

The same result is found when the parasitic gap comes first. Reconstruction into either the first or the second gap is equally unacceptable.

(385) a. * It is only himself that [people who know pg_{i} think John should blame t_{i}].

b. * It is only themselves that [people who blame pg_{i} will realize John has conned t_{i}].

With PP arguments that are moved ATB, reconstruction into both gaps seems to be grammatical, as in (386). However, there is a contrast between a and b sentences. In (386a), Mary can either throw the rug over John or over herself. In (386b), she can only be pulling the blanket over John. Again, this can be explained via vehicle change. The index remains the same, but the NP can change, from a reflexive to a pronoun.

(386) a. [Over himself]$_{\text{i}}$, [John pulled a blanket t_{i}] and [Mary threw a rug t_{i}].

b. [Over himself]$_{\text{i}}$, [Mary pulled a blanket t_{i}] and [John threw a rug t_{i}].

An important note is that here we we seem to be able to do vehicle change in first trace copy. It is not clear why this is the case. I leave this issue for future research.

Asymmetries in reconstruction with condition C were reported in Citko (2005), Salzmann (2012), among others. It is claimed that only reconstruction into the initial gap gives rise to condition C violation.

(387) (Citko 2005, 494, (12))

a. Which picture of $\text{John}_{\text{j i}}$ did [he_{j} like t_{i}] and [Mary dislike t_{i}]?

b. Which picture of $\text{John}_{\text{j i}}$ did [Mary like t_{i}] and [he_{j} dislike t_{i}]?

However, some speakers do not find a contrast in examples such as above. Additionally, if we consider the PG constructions, the reconstructions do not show any asymmetry in condition C effects, as shown below.

(388) a. This is the type of story about Obama that people who hear pg_{i} think he will be angry about t_{i}.

b. This is the type of story about Obama that people who tell him to ignore pg_{i} always end up talking about t_{i}.

Unfortunately, all of the speakers polled found the sentences in (388) ungrammatical (for unclear reasons), but these are the types of sentences that we would need to test in order to determine if asymmetries in reconstruction for Condition C are due to linear order.

Therefore, reconstruction facts do not argue that ATB gaps are different in nature. In cases where asymmetry occurs, the factor is linear order. People observed asymmetries between gaps in ATB movement. These asymmetries are also observed in PGs. My new observation is that when PGs come before the real gap, the asymmetry can be seen to be due to linear order, not the nature of the gap (real vs parasitic). So we can conclude that in cases of multiple gaps, asymmetries are due to linear order. Turning to ATB movement, this will account for the asymmetries, and we cannot conclude anything about the nature of the two gaps. This conclusion will be the motivation for adopting a forking chains analysis in which the extracted element has copies in all the gaps.

Zhang (2010a) claims that ATB gaps are asymmetrical in island effects. This view contradicts earlier work, which found that island effects are observed in all conjuncts (Williams 1977) in ATB movement. Zhang shows that extraction from an island

in the initial conjunct is ungrammatical, as in (389), but extraction from an island in a non-initial conjunct does not result in ungrammaticality as long as the gap in the initial conjunct is not inside an island, as in (390).

(389) (Zhang 2010a, 217, (8.20))

a. * The same student$_i$, [the teachers who often praise t_i are functionalists, and the formalist teachers often criticize t_i].

b. * The same nurse$_i$, [John is still wondering whether he should date t_i and Jack has dated t_i].

(390) (Zhang 2010a, 218, (8.21))

a. The same person$_i$, [Bill praised t_i a lot and Mary lost business because she hired t_i].

b. The same nurse$_i$, [John has dated t_i and Jack is still wondering whether he should date t_i].

However, the examples Zhang provides do not make her point because extraction from the second conjunct is licit by itself, in a non-coordinate sentence.

(391) a. Who$_i$ did Mary lose business because she hired t_i?

b. [Which nurse]$_i$ is Jack still wondering whether he should date t_i?

In addition, Zhang's generalization does not seem to be accurate. Empirical evidence shows the opposite of her generalization. Conjuncts are symmetrical in island effects. In (392), a gap occurs in an island in a non-initial conjunct. Still, the sentences are ungrammatical.

(392) a. * Who$_i$ did [a man who loves t_i dance] and [a woman who hates t_i go home]? (Bachrach and Katzir 2009, 285,(1))

b. * What$_i$ did [everyone discuss t_i] but [talking about t_i was difficult].

c. * What$_i$ will [it surprise you to hear t_i] and [talking about t_i be difficult]?

In addition, Munn (1993) presents numerous examples which show that islands are illicit in non-initial conjuncts, which I include below.

(393) [Which man]$_{i}$ did John [interview t_{i} and ...

a. expect us to hire t_{i}].

b. expect us to give the job to t_{i}].

c. * expect us to ask which job to give to t_{i}].

d. * wonder who to ask which job to give to t_{i}].

e. tell you that you should give the job to t_{i}].

f. * read the book you gave to t_{i}].

g. * hear about the plan to speak to t_{i}].

h. ?* announce the plan to speak to t_{i}].

i. ?* hear about the plan to speak to t_{i}].

j. * expect you to leave without meeting t_{i}].

k. * meet the man in the office near t_{i}].(Munn 1993, 41, (2.40))

Some researchers argue that islands are non-syntactic constraints. In fact, all ATB gaps can be insensitive to islands under certain conditions, as shown below.

(394) [Which book]$_{i}$ did [John meet the man who wrote t_{i}], and [Mary meet the woman who published t_{i}]? (Bachrach and Katzir 2009, 285,(2)).

So it appears that island facts are dubious, and islands might be in fact non-syntactic constraints, as proposed in recent literature. Native speakers do not seem to agree on the grammaticality of violations. Whether islands are syntactic constraints or not, this is not the issue here. In all cases, islands do not support the claim that ATB gaps are different in nature. (See Abrusán (2007), Sag et al. (2007), and Chaves (2012b) for arguments that islands are non-syntactic constraints.)

To sum up, I have shown that the asymmetries between the real gap and the PG in WCO and reconstruction in PG constructions are due to linear order since the effects reverse when the PG precedes the real gap. I propose that the same effects that have been found in ATB construction are also due to linear order, not the nature of the

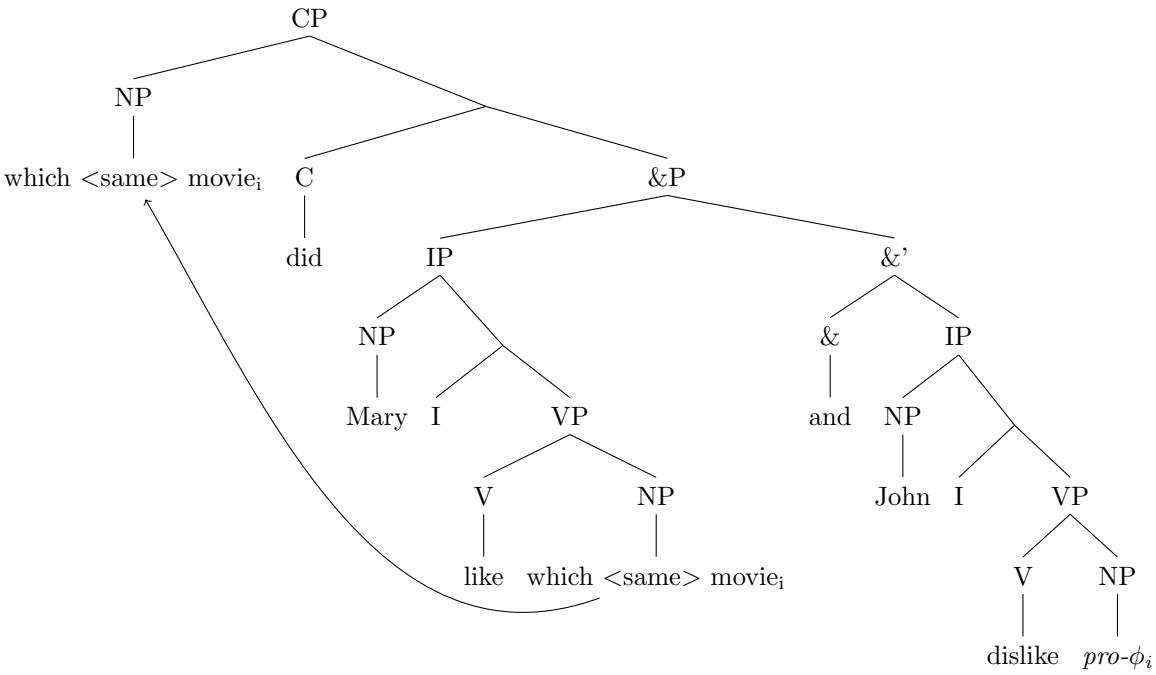
gaps themselves. Thus, the PG analysis of ATB movement is not right. Instead, the ATB gaps do seem to be of the same nature. This will be the motivation for adopting a forking chains analysis of ATB movement in section 4.2.4.

4.2.3 The Null Pro Analysis

Now I turn to a discussion of a more recent analysis of ATB movement, advanced in Zhang (2010a). Zhang argues that in ATB extractions, such as (395), a covert similarity expression (SE), *same*, modifies the extracted element in its base position in the initial conjunct. Non-initial gaps contain null pro-forms which are coindexed with the extracted element.

(395) [Which movie]$_i$ does Mary like t_i and John dislike *pro*-ϕ_i?

(396)



Zhang's main argument for this analysis, in addition to the asymmetries discussed in section 4.2.2, is that ATB movement always gives rise to an identity reading between the gaps. For instance, Zhang claims that (397) is unacceptable because of the

identity reading of the ATB gaps; the interpretation requires that the same documents have been written on a specific day and filed on the day before, which is anomalous.

(397) (Zhang 2010a, (9.5))

a. # Tell me which documents John wrote today and Mary filed yesterday.

b. #The same documents, John wrote today and Mary filed yesterday.

However, it has been shown that ATB movement admits a *respectively* reading (Munn 1999b; Chaves 2012a). Compare (397) to (398). When the extracted element is a plural, the sentence becomes grammatical under the *respectively* reading, in which the set of documents that were written is different from the set of the documents that were filed.

(398) The documents that John wrote today and Mary filed yesterday will be shredded on Tuesday and Wednesday respectively.

Note that (397) becomes grammatical if we use *different*:

(399) It was two different documents, that John wrote today and Mary filed yesterday.

ATB gaps can also have an additive reading, where the set denoted by the wh-quantifier is a union of the set predicated by the verb in the first conjunct and the set predicated by the verb in the second conjunct. In (400), the ATB question can have an additive interpretation, in which the wh-quantifier denotes a union of the set of opponents defeated by John and the set of opponents Mary lost to. (This question can also have the identity reading, where the opponents John defeated are identical to the ones Mary lost to.)

(400) [How many opponents]$_{\{x,\,y\}}$ did John defeat $t_{\{x\}}$ and Mary lose to $t_{\{y\}}$? (Chaves 2014, 835, (3a); modified)

Therefore, Zhang's generalization that ATB gaps always give identity reading is inaccurate. Her analysis has no way to get the respectively reading since it has a covert *same* operator.

An additional argument Zhang advances in favor of the Null Pro analysis comes from languages that involve multiple wh-fronting. In these languages, it is impossible to front different wh-words from different conjuncts. Zhang takes this to indicate that ATB movement occurs only when the gaps created by movement have the same identity.

(401) a. Russian (Kasai 2004, 169; translation modified)

*Koga$_{i}$ sta$_{j}$ on [vidi t_{i}] i [jede t_{j}]?
whom what he sees and eats
'Who does he see and what does he eat?'

b. Polish (Citko 2003, (7))

*Kogo$_{i}$ kogo$_{j}$ Jan lub t_{i} a Maria kochat_{j}?
whom whom Jan likes and Maria loves
'Whom does Jan like and Maria love?'

However, the ungrammaticality of sentences like (401a) does not show that ATB movement is not possible if the gaps do not have the same identity. Rather, the ungrammaticality is due to a violation of the parallelism constraint. Here the coordination is symmetric. Thus, any extracted element must bind a gap in every conjunct, which is not the case here. *Koga* binds a variable only in the first conjunct, while *sta* binds a variable only in the second conjunct. The coordination here is symmetric because there seems to be no logical connection between the conjuncts. Thus, the examples above do not show that ATB movement may take place only when the gaps have the same identity. It just shows that in symmetric coordination, any extracted element must bind a variable in all conjuncts.

The analysis that I will propose, a forking chain analysis, is compatible with all sorts of readings. Following Chaves (2012a), I take *respectively* readings to be a variety of cumulative readings that arise with plurals. The identity reading is predicted given that copies of the extracted element are merged into every extraction site in the Left-to-Right derivation model I will adopt. (See below.)

4.2.4 Deriving ATB Constructions

As I have shown in section 4.2.2, the asymmetries that are observed in ATB movement arise due to linear order. Thus, the facts about ATB movement are compatible with a forking chains analysis and with a PG analysis. In this section, I present my analysis of ATB movement in the Left-to-Right derivational model I adopt. My analysis assumes movement from all conjuncts. The reason I prefer this analysis over the PG analysis is that true parasitic gap constructions are restricted to nominals, whereas ATB movement is not (Postal 1993).

I will start with the asymmetrical coordination case. Element extraction can be asymmetrical or ATB in this case. Consider the examples below, reproduced from a previous section.

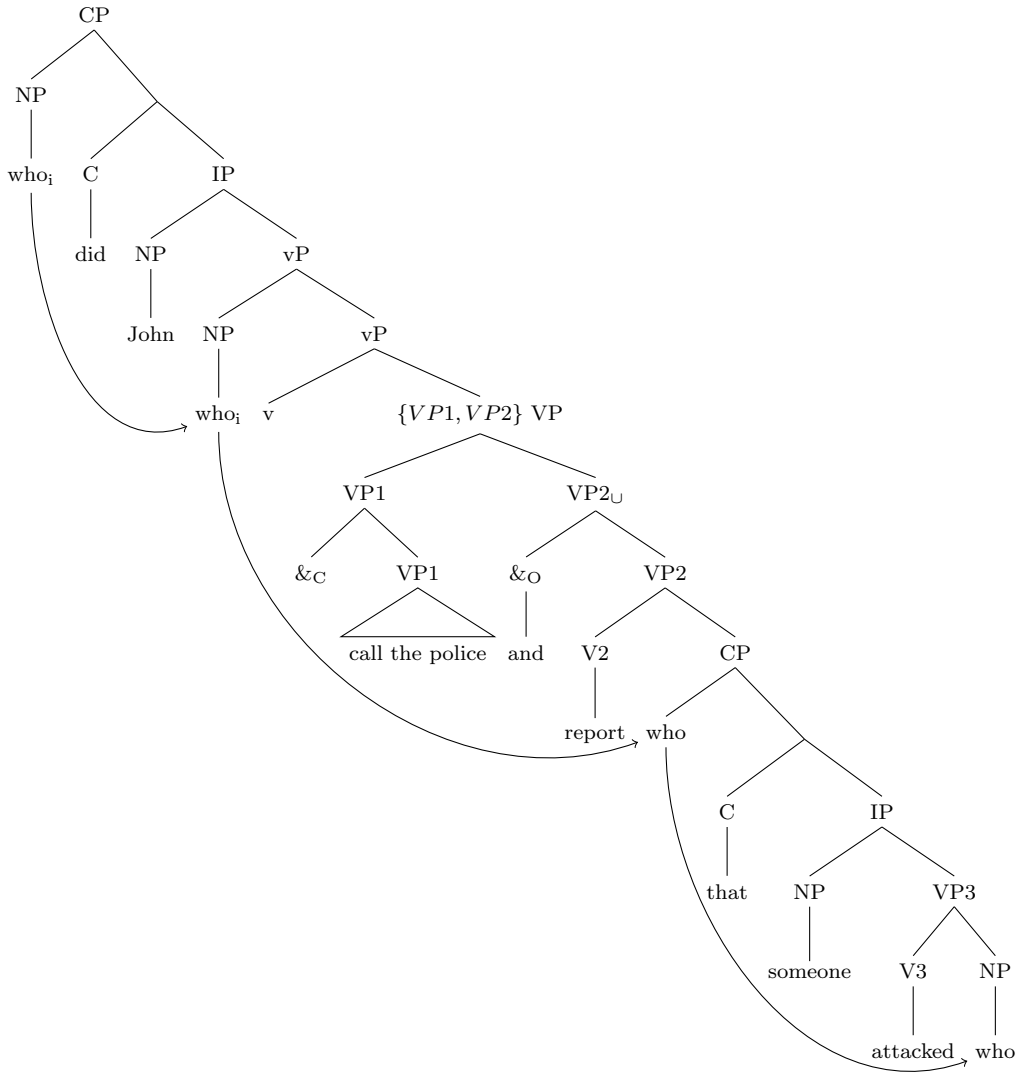
(402) a. Who$_{\text{i}}$ did John call the police and report that someone attacked t_{i}?

b. Who$_{\text{i}}$ did Mary say that she met t_{i}, and got a new job offer?

c. Who$_{\text{i}}$ did Mary say that she met t_{i} and had dinner with t_{i}?

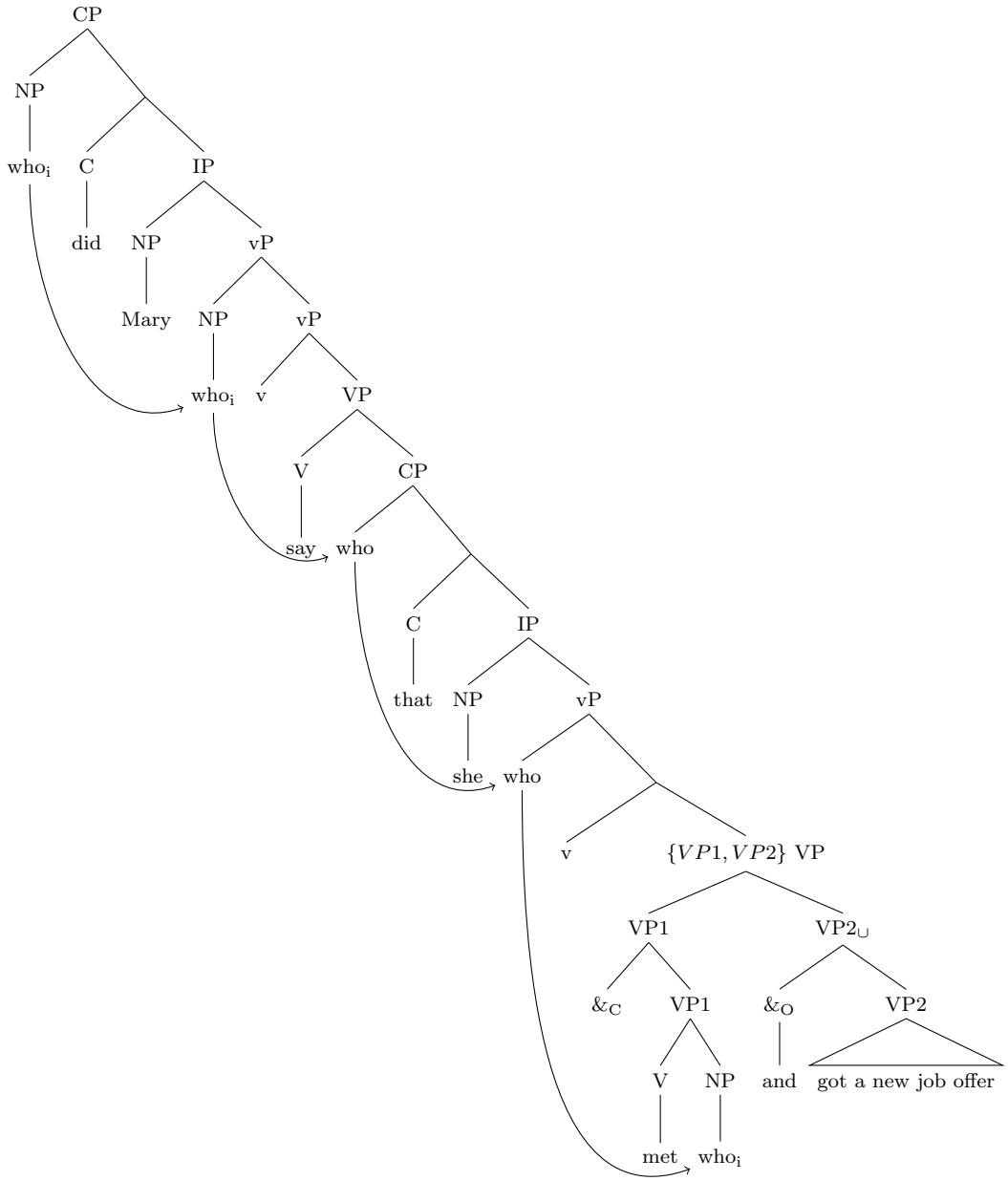
In (402a), in which extraction occurs from the final conjunct, extraction occurs in the typical way. I assume that the derivation proceeds from left to right. I adopt the Phase Theory view of successive-cyclic movement where wh-movement leaves a copy at every phase edge. However, in my analysis, unpronounced copies of the wh-phrase are merged at each phase edge from left to right. So the derivation here is the reverse of the successive-cyclic movement.

(403)



Extraction from the initial conjunct in (402) proceeds in the same way. Copies of the extracted element, *who*, are merged at phase edges until a copy is merged in a theta position. Nothing is remarkable about extraction here as well.

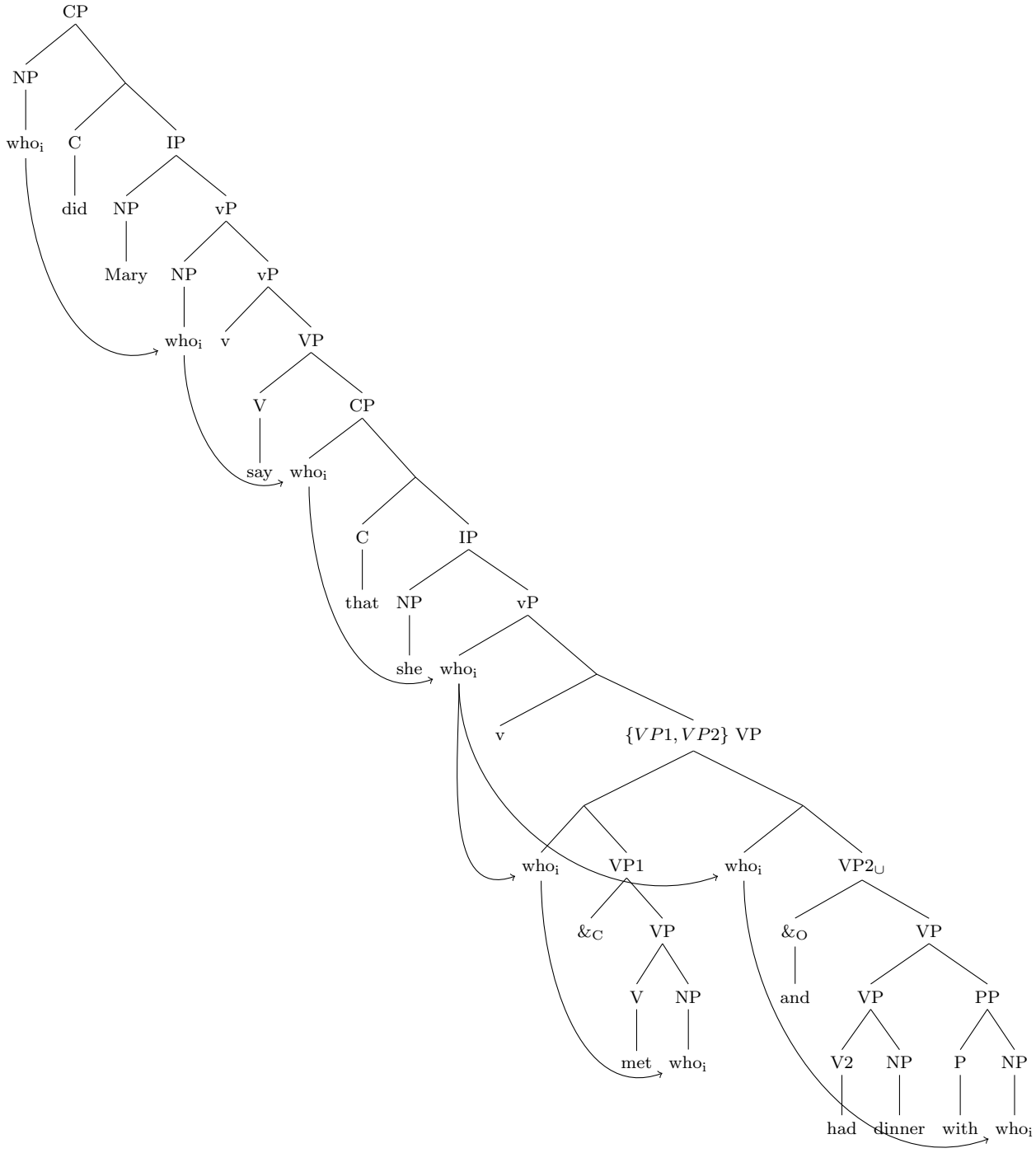
(404)



As for ATB extraction, as I have proposed before, abstraction over the coordinate takes place when the derivation encounters the set label of the coordinate. I proposed that in symmetric coordination, abstraction *must* be over *all* conjuncts. This is forced by merging a copy of the extracted element at the edges of all conjuncts, starting from left to right. This is the only way conjuncts respect semantic parallelism.

While this is obligatory for symmetric coordination, it is optional for asymmetric coordination. I show an example of ATB extraction in asymmetric coordination in (405).

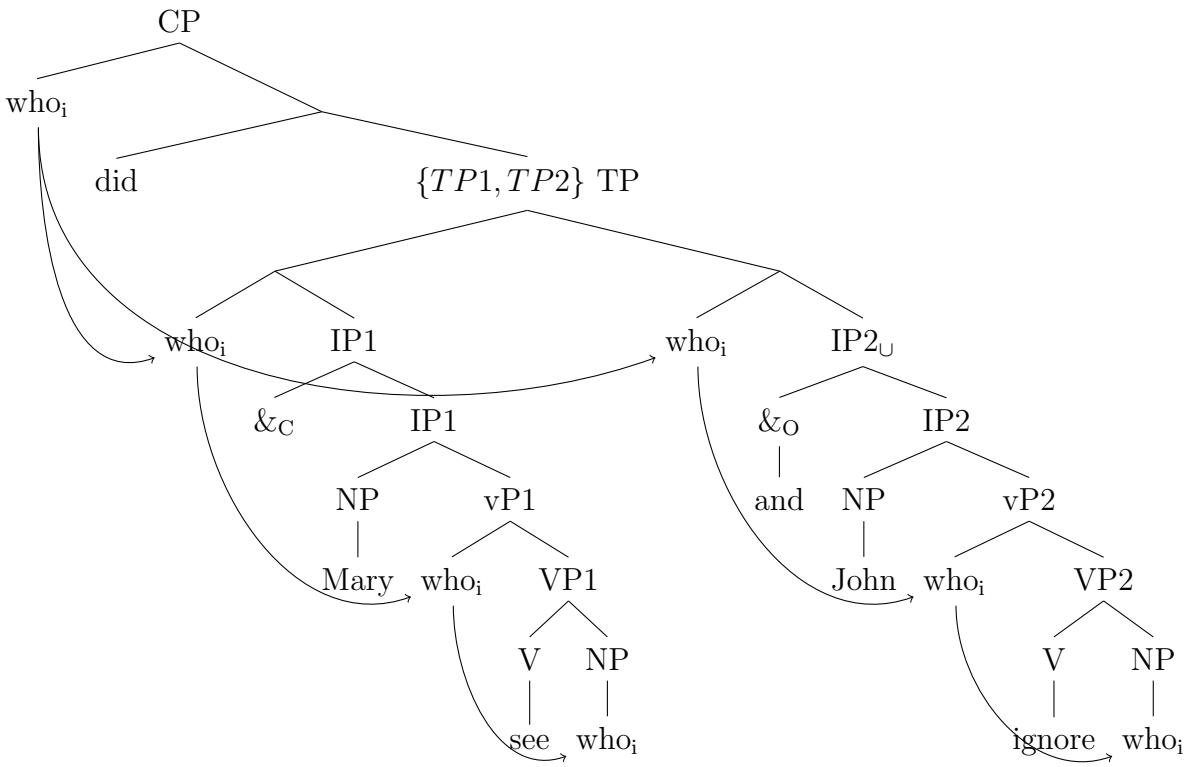
(405)



The same derivation I explained above applies in symmetric coordination. Again, in this case abstraction over all conjuncts is obligatory. I illustrate the derivation of (406) in (407).

(406) Who$_i$ did Mary see t_i and John ignore t_i?

(407)



Consider the illicit extractions in (408). Here the coordination is symmetrical. The version of the sentences before extraction is a combination of identical semantic types, namely $\langle t \rangle \& \langle t \rangle$, In both sentences, the asymmetric extraction causes conjuncts to mismatch in semantic types, violating parallelism.

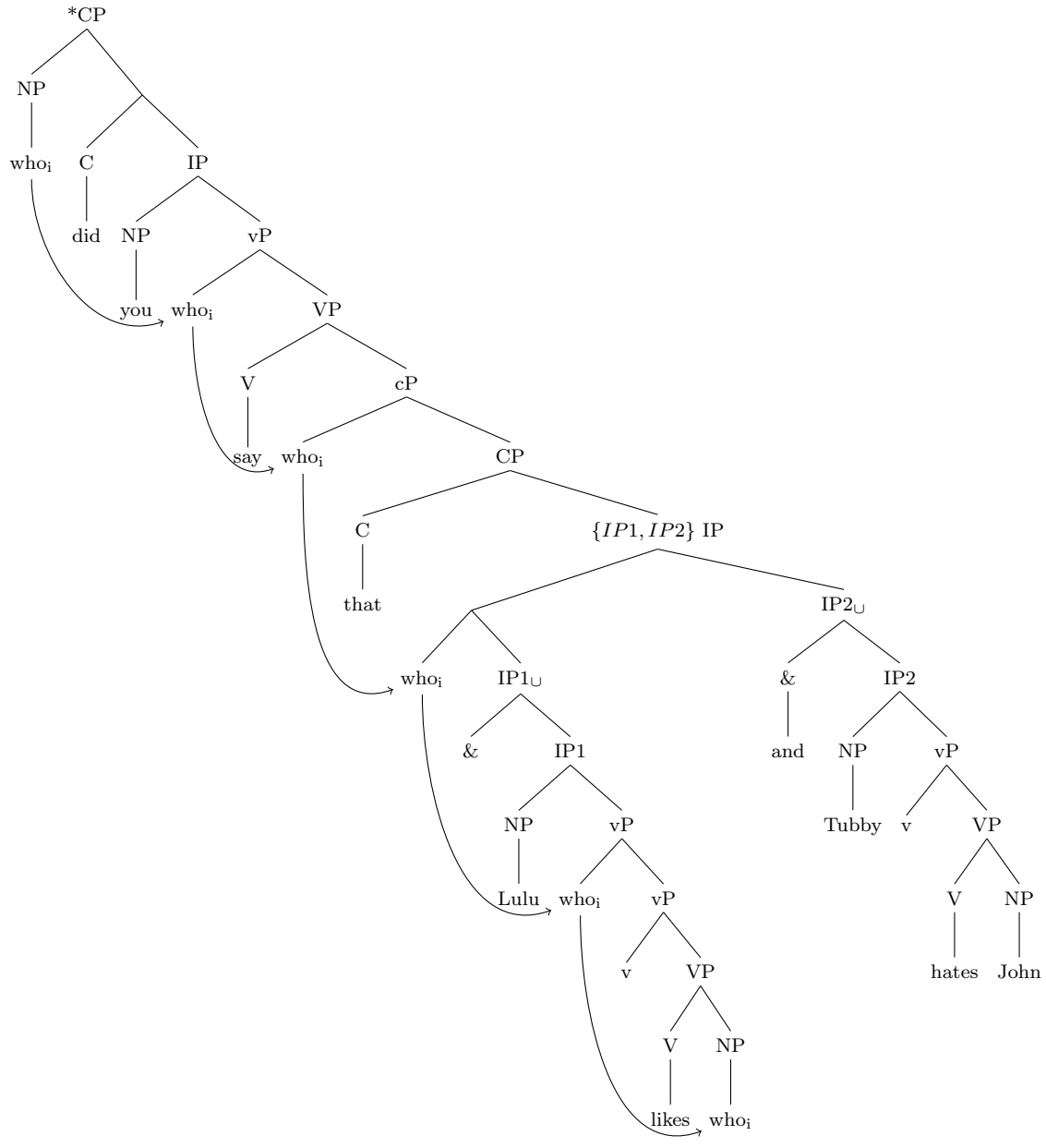
(408) (Zhang 2010a, 222, (9.1); adapted)

a. *Who$_i$ did you say that Lulu likes t_i and Tubby hates John?
$\langle e, t \rangle$ & $\langle t \rangle$

b. *I saw the person who$_i$ Lulu likes John and Tubby hates t_i.
$\langle t \rangle$ & $\langle e, t \rangle$

As represented in tree (409), the second conjunct involves no abstraction. This is a violation of the parallelism constraint. Abstraction does not spread to all conjuncts, causing the derivation to crash.

(409)



To wrap up, I have proposed a forking chains analysis of ATB movement in a Left-to-Right derivational model where copies of the extracted element are merged at

phasal edges. Set Label forces abstraction at the edges of the conjuncts. This sort of abstraction is obligatory in symmetric coordination. My analysis is similar to the forking chains analysis in that copies of the extracted elements occupy the ATB gaps, but is different in the direction of derivation. Rather than assuming that the ATB gaps merge into one constituent in a bottom-top model, I assume that the derivation proceeds from left to right with copies of the extracted elements being merged into the extraction sites. Note that the left-to-right structure building is a more plausible derivation for a forking chain analysis of ATB movement. Copies of the extracted element are merged as the derivation proceeds, with multiple copies being created as necessary. Two copies can be created in the same way for two theta positions. In upward movement, though, somehow two different NPs have to merge into one by some mechanism that has not been made precise.

In section 4.2.2, I have shown that the parasitic gap analysis of ATB movement does not seem to be right. In addition, PGs are limited to NPs. It is possible that ATB movement can be achieved by two mechanisms: a forking chains or a PG, as in Munn (2001), but without a compelling reason to think this is true, a uniform analysis should be preferred.

4.3 Summary

In this chapter, I took up the issue of what constraints restrict extraction out of a coordinate. I defended the analysis that the Conjunct Constraint is a constraint on pronunciation. I have argued against recent claims the this constraint may be violated in so-called *comitative coordinates*, and shown that these contexts are comitatives that have structures distinct from coordinate structure. I concluded that the CC is inviolable. In my framework, coordination is assigned a set label. I defined the CC as a constraint that bans null set members.

In the second section of the chapter, I addressed the constraints on element extraction. First, following Munn (1993) and others, I proposed that the only constraint on extraction should be semantic parallelism which only applies in symmetric

coordination. The necessity of ATB movement in this context follows from the fact that symmetric coordination allows only similar semantic types. Second, I argued that the asymmetries between ATB gaps are due to linear order not the nature of the gaps. Thus, the facts are compatible with a PG analysis and a forking chains analysis of ATB movement. However, I adopt a forking chains analysis of ATB movement because PGs can only be nominals. Although both forking chains analysis and PG analysis are possible, as Munn (2001) suggests, there is no compelling reason to think this is true.

Chapter 5

CONCLUDING REMARKS

In this thesis, I investigated the syntax of coordination, focusing on structure, agreement and extraction. I have accomplished three main goals. First, I showed that the asymmetries between conjuncts in selection, binding, agreement, crossover, and reconstruction are due to linear order. Second, I proposed that coordination is special in requiring a special sort of labeling, I call set label, computed by set union, triggered by the coordinator. Third, I revisited the Coordinate Structure Constraint, and showed that the Conjunct Constraint is an inviolable constraint on pronunciation and that the Element Constraint should be eliminated from the grammar. I argued that the only constraint on extraction is semantic parallelism, which is only operative in symmetric coordination. All of the above was couched in terms of a Left-to-Right derivational model (Philips 1996).

The arguments presented in the this thesis add to the debate on where linear order should be specified. Recent analyses proposed that linear phenomena, such as CCA, should be delayed to PF, where hierarchical relations are translated into linear precedence relations. However, the facts, especially those about selection, show that linear order should be specified in the syntax.

Recent work of the syntax of coordination, mostly proposed in the framework of the Minimalist Program (MP), capitalized on the idea that many of the coordinate-specific principles and constraints should be eliminated from the grammar for reasons of economy and efficiency. In this work, I have questioned this view and reconsidered many of the claims of these analyses. I concluded that coordination *is* special in many ways. Coordination is special in requiring a special sort of labelling and in imposing a semantic parallelism constraint on extraction out of symmetric coordination.

The thesis contributed to discussion of the issue of what plausible analysis should ATB extraction receives. I showed that many of the asymmetries between gaps in ATB and PG constructions are due to linear order. Thus, the facts are compatible with PG and forking chains analyses of ATB movement. I adopted the latter because of the restrictions on PGs. However, future research has to find out if both analyses are possible, as suggested by Munn (2001).

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