STRUCTURE FOR COORDINATION

Part I

by Ljiljana Progovac

Capturing the structure of coordination has long posed a challenge for any theory of syntax. Given the systematic and pervasive nature of coordination cross-linguistically, it has become clear that the degree of success of any theory of language structure largely depends on how successful it is in integrating coordination. The recent years have seen a significant progress: numerous sophisticated analyses of coordination have been advanced, and a wealth of new data has been uncovered. The ripple of coordination is on the verge of being resolved.

Part I of this paper introduces the representative data relevant for determining the structure for coordination (section 1), and provides a survey of the analyses of coordination that do not treat conjunctions as heads of conjunction phrases (section 2). Part II, to appear in Glot International 3.8 (see box), provides a survey of those analyses of coordination that do treat conjunctions as heads of conjunction phrases (section 3), as well as the extensive Bibliography.

1. Representative Data
1.0. Introductory words

This section introduces the data generally considered in developing a theory of coordination. It includes not only some well-known data concerning coordination, such as asymmetries among conjuncts, but also some less-known data, such as repetition of conjunctions in front of each conjunct, as well as some old data that have been reanalyzed and rethought, such as the (lack of) c-command effects among conjuncts. In order to keep this paper finite in size, the intricacies of Gapping, Right Node Raising, and VP-ellipsis will not be discussed here in any detail; the reader is referred to Johnson (1996).

1.1. Asymmetry: Ross' effects

Ross (1967) concluded that the second conjunct in VO languages (including English) c-commands the rest of coordination or not. The rest of the coordination cannot be bound by the first conjunct. This is most readily observed in languages with possessive reflexives, as illustrated for Serbo-Croatian in (17), but it is also obvious in English (18), (see Collins 1988a,b and Munn 1993).

(17) *Jovan i svoja,lena au stigli.
Johni and self's wife are arrived

(18) *John and self's wife have arrived

Collins (1988a,b) and Munn (1993) discuss the following contrasts that illustrate that extraction is possible only of the last conjunct and conjunction, but not of the first conjunct and conjunction, which fact supports Ross' conclusion:

(1) John left, and he didn't even say good-bye.
(2) John left, and he didn't even say good-bye.
(3) *John left and. He didn't even say good-bye.
Collins (1988a,b) and Munn (1993) discuss the following contrasts that illustrate that extraction is possible only of the last conjunct and conjunction, but not of the first conjunct and conjunction, which fact supports Ross' conclusion:

(4) John read a book yesterday, and the newspapers.
(5) *John read the newspapers yesterday, the book and.
In addition, Zorner (1995) points out that in Serbo-Croatian (13) is used to replace the last conjunct(s) and the conjunction, establishing the two as a constituent.

(6) I bought jam, bread, etc.
(7) *I bought jam, bread, and etc.

These data seem to stand on a firm ground, and have been widely exploited in the GB literature as evidence for a hierarchical organization of the &P (Conjunction Phrase), as will be seen below.

1.2. Is there c-command?

The literature that adopts a hierarchical approach to coordination assumes or argues that the first conjunct in VO languages (including English) c-commands the rest of coordination. Of course, this would constitute the strongest possible argument for hierarchy. However, such a c-command relationship is not a necessary consequence of a hierarchical organization of the coordination phrase, as will become clear in the later discussion.

The question is, then, whether the first conjunct c-commands the rest of coordination or not. The answer seems to be ‘no,’ since the arguments for c-commands are at best ambivalent. The rest of the section reviews these arguments.

Collins (1988a,b) and Munn (1993) attempt to capture the contrasts below by invoking Principle C, which is only possible if the first conjunct c-commands the second:

(8) John's dog and his/him went for a walk.
(9) *He/him, and John's dog went for a walk.
However, the same effect is observed even across sentences, where Principle C cannot be invoked, since structural relations such as c-command operate only within sentence boundaries:

(10) *He, finally arrived. John's dog went for a walk.
It must be then that some other, possibly pragmatic, principle is responsible for the ungrammaticality of (10). This same principle, whatever it is, can then also account for the ungrammaticality of (9). Given the additional data below, it seems that we not only can, but must, attribute (9) to something other than Principle C. If principle C were operative between conjuncts, it would render (11) and (12) below equally ungrammatical. (11), however, is perfectly grammatical, while (12) is marginal and frowned upon, at best.

(11) John and John's wife are certainly invited.
(12) *John certainly likes John's wife.
Another type of argument for c-command comes from bound pronouns. The possibility of binding a pronoun in (13) may look like an argument for c-command between conjuncts. However, this can only be an argument that every conjunctions his at LF, since quantifiers are subject to the rule of Quantifier Raising (QR) (May 1977):

(13) Every, man and his dog went to a meadow.
(Munn 1993)

The proposal that the pronoun is c-commanded by JP at LF, rather than the trace of QP, is supported by the data discussed in Hornstein and Weinberg (1990) (thanks to Marc Authority and Lisa Reed for pointing this out to me). The data show that anaphoric pronouns can function as bound variables (14), but since they obey Condition C, this is only possible if the QP in an A-bar position, but not its trace in an A-position, c-commands the epithet at LF. Otherwise, (15) would be grammatical:

(14) John criticized every senator, in private while praising the bastard, in public.
(15) *Bill, expected that the bastard, would win.
The ungrammaticality of (16) below would follow from some version of the Leftness Condition (see Comiskey 1973, Higginbotham 1980, as also pointed out in Munn (1993)).

(16) *His dog and every, man went to a meadow.
This leaves us with no evidence for c-command between conjuncts.

In addition, across-linguistic data on binding and negative concord reinforce the conclusion that there is no evidence that the first conjunct c-commands the second (for more details and arguments, see Progovac 1996, 1997, to appear a).

A reflexive pronoun in the second conjunct cannot be bound by the first conjunct. This is most readily observed in languages with possessive reflexives, as illustrated for Serbo-Croatian in (17), (see Collins 1988a,b and Munn 1993).

(17) *Jovan i svoja,lena au stigli.
Johni and self's wife are arrived

(18) *John and self's wife have arrived

Likewise, a negative word in the first conjunct cannot license a negative polarity item only in the second (19). (For conditions on polarity licensing and negative concord, see e.g. Ladasaw 1980 and Zanutti-ni 1991). In fact, one is required to use two negatives, as in (20), where the use of two negatives does not result in a dialectal/negative concord use.

(20) Nobody chased nobody and/or any dogs.
(21) Nobody chased nobody and/or any dogs.
(22) Nobody chased no dogs.

There may exist alternative explanations for each of the effects discussed above. For negation, one can argue that the negative feature needs to raise out of the coordination phrase (see Zanuttini 1991 and Haegeaman and Zanuttini 1991), but that such raising is blocked by CSC (Coordinate Structure Constraint) which prohibits movement out of coordinated phrases in general (see section 1.10). For binding, one can...
argue that the conjuncts do not satisfy the condition on co-argumenthood and that this leads to ungrammaticality (see e.g. Hellan (1988) and Reinhardt and Reuland (1993)). At the very least, then, one can say that there is no evidence for c-command between conjuncts. However, given that Principle C also does not hold between conjuncts (see the contrast between (11) and (12)), a stronger conclusion suggests itself: conjuncts do not c-command each other. Thus, a theory of coordination from which this conclusion follows is to be preferred.

There is only an apparent tension between the data that point to a hierarchy (section 1.1.) and the data that point to the conclusion that there is no c-command among conjuncts, as will be seen below.

1.3. Subcategorization

The question of subcategorization is relevant for coordination in two different ways: (i) first, the question arises whether or not all conjuncts have to satisfy the subcategorization requirements of the head by which they are governed; (ii) second, if a coordination phrase dominates conjuncts, it is not clear how such a phrase can satisfy the subcategorization requirement of a head that selects an NP, for example. Related to this question is also the question of conjoinability of different categories. If a coordination phrase host an NP, a VP and/or an AP, as in (23) below, what features will such a coordination phrase have?

(23) Pat has become [a banker] and [very conservative].

(Sag et al. 1985)

Different analyses offer different solutions to this problem, as will be made clear in sections 2 and 3.

As far as the first question goes, the data suggest that not all the phrases have to satisfy the subcategorization requirements of the governing head, as the following examples illustrate (see Gazdar et al. 1985):

(24) Pat was annoyed by [the children’s noise] and [that their mother] and ‘children’ in (33), suggesting that whatever the hierarchical relation between ‘mother’ and ‘three children’ is in (34), it cannot be the same as the one in (33).

This is not the whole story, however. In various languages, including English, singular agreement can be selected even with conjunction phrases, under certain circumstances. In the following examples from English, however, the conjunct alone is responsible for the choice of agreement on the verb (see (35) and (36), which case is reminiscent of (34) above, and not of (33):

There is there? [a man and three children] at the front door.

(36) There is there? [three children and a man] at the front door.

Agreement with the first conjunct is only possible if the subject &P is preceded by the verb. Camacho (1997, 85) states that, if a language has alternative word orders, agreement with one conjunct, or partial agreement, will occur with non-canonical word order. The same preverbal/postverbal asymmetries arise in many other languages. Vago (1994) reported for Arabic, Irish, Portuguese, and Russian (see McCloskey and Hale 1984, McCloskey 1986, 1989, van Oorsouw 1987, Munn 1993, 1996, Bennamoun 1992, Arun, Bennamoun and Sportiche 1994, Bayhonyshvile 1996, etc.). The following Arabic examples illustrate that first conjunct agreement is possible, but that it only occurs in verbal positions:

(37) el-walad we-l-banat gatalab el-bisse the-boy and-the-girls killed-3PL/MASC the-cat

“The boy and the girls killed the cat.”

(38) el-walad we-l-banat gatalab el-bisse-fl-pfem el-the-boy and-the-girls killed-3PL/MASC-the-boy and-the-girls-the-cat

Some analyses of coordination, such as Munn (1995), capitalize on this set of data to argue that the first conjunct is what the &P adjoins to, but that the first conjunct alone is not really the part of this &P (see section 3.3. Part II). With this analysis for Arabic, the data with first conjunct agreement, it has to say something special about plural agreement with two singular conjuncts, as in (31), for example.

Bayhonyshvile (1997) offers an interesting analysis of this variation, based on the agreement pattern in Russian, where preverbal &P necessarily triggers plural agreement, while postverbal conjuncts occasionally occur with agreement with the first conjunct only:

(39) gatalab el-walad we-l-banat el-bisse killed-3sg/MASC the-boy and-the-girls-the-cat

V komnatu vošli/vošla/*vošel/*vošlo molodaja z

‘Into the room entered a young woman and a small boy.’

She proposes an analysis which captures, straightforwardly, the asymmetry between pre-verbal and post-verbal agreement, based on the common assumption that the subject has to check its features in TP. The preverbal subject is overtly moved to TP for this purpose. On the other hand, the postverbal subject checks its features covertly (at LF). The features of the postverbal subject, if it is an &P, either move as a whole, remaining where they are, or only the features of the first conjunct move to TP, resulting in singular agreement. If Bayhonyshvile’s analysis is on the right track, then it has the following two implications for the structure of coordination: (i) if the first conjunct is hierarchically higher than the rest of &P; otherwise, there would be asymmetry with respect to which conjunct can check its features in TP; (ii) first conjunct agreement data can be captured even if the first conjunct is the part of &P.

1.5. Conjunction Doubling

By Conjunction Doubling I will refer to the repetition of the conjunction in front of all conjuncts, including the first. (This differs from the process found in English of repeating only the intermediate conjunctions.) Conjunction Doubling is available in French, Italian, Japanese, Serbo-Croatian (SC), and other languages, e.g. Payne (1985) for more languages, but not in English:

(40) French (Kayne 1994):

Jean connait et Paul et Michel.

Jean knows both Paul and Michel.

(41) Italian:

Sono arrivato e Anna, e Roberto, e Laura. are-arrived and Anna and Roberto and Laura

‘And Roberto and Laura have arrived.’

(45) Serbo-Croatian:

I, Marija, i Milan, i Petar studiraju lingvistiku.

‘Mary and Milan and Peter study linguistics.’

(46) English:

And Mary and Peter study linguistics.

As illustrated with comma placement for Serbo-Croatian, it raises the question of why the conjunctions (pauses) suggest that each conjunction forms a unit with the immediately following conjunct in VO languages. No other comma patterns are possible, as given below:

(47) Serbo-Croatian:

I, Marija i Milan i Petar studiraju lingvistiku.

(48) Italian:

Sono arrivati e Anna e Roberto e Laura.

Interestingly and importantly, head final languages, such as Japanese, double their conjuncts in the right, as illustrated below (see Kuno 1973, Kayne 1994, Zoerner 1995). This provides a powerful argument for treating conjunctions as heads (see section 3, Part II). This is so because conjunctions show the same order with respect to conjuncts that other heads show with respect to their complements.

(49) Japanese:

Robinto Kin-to Terry-to-ja

Robinto and Kin and Terry and CASE

Since the Conjunction Doubling strategy is available crosslinguistically, a theory of coordination that can accommodate these data is to be preferred.

1.6. Chaotic Case

Recent accounts have started to make use of unexpected Case assignment in coordination phrases, most notably Zoerner (1995) and Johannessen (1998). It is well-known that coordination phrases in English tolerate accusative Case assignment to subjects, and nominative Case assignment to objects, as illustrated below. The examples also show that a mixture of nominative and accusative Cases is possible in a single coordination phrase.

(50) Subjects:

They and us are going to the game together.

(Stahlke 1984, 360, quoted in Johannessen 1998)

(51) She and him will drive to the movies.

(Shwartz, B.D. 1985, 165, quoted in Johannessen 1998)

(52) Objects:

All debts are cleared between you and I.

(Shakespeare, Merchant of Venice, quoted in Johannessen 1998)

(53) I really wanted my mother to live with my husband, Michael and I.


Johannessen (1998) offers data from 32 languages demonstrating that this phenomenon is widespread and systematic. For her, (50) would be the case of EIC (Extraordinary Balanced Coordination), in which both conjuncts receive unexpected Case; in contrast, (51) would be a case of UC (Unbalanced Coordination), in which only one conjunct receives unexpected Case. She establishes the following correlation (1998, 55):

(54) Johannessen’s Correlation:

“There is a very strong correlation between, on the one hand, the order of verbobject, and on the other, that of normal conjuncts and post-copula equally the same as that between conjunction-deviant conjunct.”

Out of 12 OV languages (Amharic, Burushaski, Eastern Mari, Hopi, Japanese, Latin, Qafar, Sidaan- muf Afi, Swahili, Tamil, Turkic, Yaghnib, N1) have the deviant UC (case configuration, including Yaghnib), out of 14 VO languages, all have the
deviant UC conjunct in the second position (Czech, English, Fulfulde, Ga, Italian, Norwegian, Old Hebrew, Old Irish, Old Norse, Palestinian Arabic, Serbo-Croatian, Slovene, Tokelauan, Welsh). In her sample, there are six languages whose word order is mixed or unclear (Afrikaans, Dutch, Estonian, German, Homeric Greek, Vedic), and which do not conform to the correlation. Since English is a VO language, it follows from (54) that the deviant conjunct in Unbalanced Coordination will necessarily be the second conjunct.

On the other hand, it follows from Zoerner’s (1995) generalization in (55) that deviant Case in the first conjunct is grammatical in English (56–57), as long as all non-final conjuncts share it. (58) and (59) are claimed by Zoerner to be ungrammatical because non-final conjuncts do not share the same Case, as required by (55):

(55) Zoerner’s Generalization
All non-final conjuncts must have identical Case.

(56) *Him, her and I all left.
(57) Robin saw he, she and me.
(58) *He, her and Robin (all) left.
(59) *Him, she and Robin (all) left.

The two analyses make different predictions. Johansen’s (1995) analysis would be falsified by grammaticality of example like (56, 57, 59, as well as by 60–63 below), while their grammaticality would follow from Zoerner’s analysis. In fact, since Zoerner draws a line only between final and non-final conjuncts, he predicts grammaticality of any Case combination in two-way conjunctions. On the other hand, Zoerner’s analysis would be falsified by grammaticality of examples like (58) and (63), while the grammaticality of (58) would follow from Johansen’s analysis. (I report 60–63 below without a grammaticality judgment.)

(60) Him and I both left.
(61) Robin saw he and me.
(62) All debts are cleared between I and him.
(63) I really wanted my mother to live with I, him, and Michael.

It may not be possible to determine a priori how the data bend here. There are many factors that influence native speaker judgments on these, including various prescriptive rules. This may well be a case where ultimately the theory will have to draw the line between grammaticality and acceptability. Not only can a prescriptive rule render a grammatical construction ungrammatical, but it can also render another otherwise grammatical construction acceptable. By ‘grammatical’ I mean generated by the rules of Grammar; by ‘acceptable’ I mean judged acceptable by native speakers.

One conclusion emerges, however: ‘deviant’ Case occurs in coordination phrases cross-linguistically, and is subject to regular cross-linguistic patterns.

1.7. Coordination of Likes Constraint (CLC)

On the basis of contrasts like (64) and (65), Chomsky (1987) concluded that syntactically different categories cannot be conjoined, which contrast has been referred to as Coordination of Likes Constraint (CLC); see also Williams’ (1978) “Law of Coordination of Likes.”

(64) the scene [of the movie] and [of the play]

*the scene [of the movie] and [that I wrote]

(65)

Schachter (1977: 90) strengthens the formulation of the principle to require semantic, as well as syntactic, ‘likeness.’ Schachter shows that just purely semantic considerations do not suffice, since there is a contrast between (67) and (68) below, even though they involve coordination of semantically equal functions. (66)

(66) "the constituents of a coordinate construction must belong to the same syntactic category and have the same semantic functions."

(67) Bobby is the man (who was defeated by Billie Jean) and (who beat Margaret).

*Bobby is the man (defeated by Billie Jean) and (who beat Margaret).

However, just as purely semantic formulations have systematic counterexamples, so do purely syntactic approaches, as well as Schachter’s formulation in (66). The examples below involve successful coordination of syntactically unlike categories:

(68) Pat has become a banker and very conservative.
(Sag et al. 1985)
(69) Robin is ugly, a dolt and of no help.
(Zoerner 1995)
(70) Robin considers Kim completely evil, a total witch, and beyond salvation.
(Zoerner 1995)
(71) [x Robin’s help] and [that he gave it so willingly] delighted Kim.
(Zoerner 1995)
(72) Robin realized [that the sky was falling] and [that the gravity of the situation].
(Zoerner 1995)

As will be discussed below, a theory based on the idea that conjunctions are heads in the X’-schema (section 3, Part II) does not have anything to say about CLC — the principle simply does not seem to have anything to do with the theory. Most of the proponents of such theories deny the existence of CLC. The basis of CLC may be more relevant in those theories of coordination that assume parallel structures, in which coordination involves a merger of two trees with identical structure in some generative context. Section 2.2. will show that extraction of a conjunct is acceptable in CLC.

1.8. Conjunction adverbs

Collins (1988a,b) argues that certain adverbs are associated with conjunctions, and that they require the conjunct, as in the following examples:

(80) *Perhaps the president will get together tonight...
(81) John and maybe Mary went to the store.
(82) Collins (1995) for formulates the constraint in (86). (83) illustrates that extraction out of a conjunct is unacceptable, while (84) illustrates that extraction out of a conjunct is unacceptable. Both contrast with the acceptable (85), where extraction is not out of a coordination phrase.

(83) ‘Which surgeon did Kim date t and a lawyer?’
(84) ‘Which surgeon did Kim date friends of t and a lawyer?’
(85) ‘Which surgeon did Kim date friends of and enemies of?’

On the other hand, Lakoff (1986) argued that CSC is falsified by a range of data, and concluded that it constitutes a worse generalization (see also Goldsmith 1985, Zoerner 1985).

(86) Coordinate Structure Constraint (CSC)

In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

Extraction out of conjuncts is allowed only if it applies Across-the-Board (ATB), as in:

(87) Which surgeon did Kim date friends of and enemies of?

In defense of CSC, Postal (in press) argues that (88) is not an instance of true coordination, but rather that one of the conjuncts acts as an adjunct (see section 3.3, Part II, for adjunction analyses of coordination). It is not the purpose of this paper to decide whether or not CSC is real. If it is real, one would expect that it follows from a more general principle, which subsumes other islands, such as Subjects, Complex NPs, etc. (see Ross 1967). There are various analyses of islandhood, but attempts to provide a unified account (e.g. Chomsky 1986) are only partly successful. While it is obvious that a successful analysis of islandhood would shed light on the structure of islands, including coordination phrases, and while it is also obvious that a successful analysis of the structure for coordination will shed light on the analysis of islandhood, this connection is not a trivial one, and, as far as I can see, has not been established yet.

Adjunction analyses of coordination (section 3.3, Part II) have claimed advantage on this issue since they reduce CSC to Adjunct islandhood. However, this cannot be a significant advantage given that there are island structures that violate, and that the nature of adjunct islandhood is not completely understood either.

2. Conjunction as non-head

2.0. Introductory words

Various analyses of coordination treat conjunction as a reflex/spell-out of a feature, rather than as a head of a coordination phrase. One of such analyses treats conjunctions as heads of coordination phrases, resulting in multi-headness (section 2.1.), while another argues that conjunctions appear at parallel levels/tiers of representation, and that there are no coordination phrases at the level of syntax (section 2.2.).

2.1. Multi-headness

Some early attempts to integrate conjunction into the phrase structure resulted in the following rules (Jackschhoff 1977, Chomsky 1981):

(89) NP → NP Conj NP
(90) VP → VP Conj VP etc.
(91) XP → XP Conj XP

Basically, the assumed structure is as in (92) below:

(92) XP

The consequences of this basic analysis of coordination, with conjuncts as heads, have been explored by many, for example, Gazdar et al. 1985, Sag et al. 1985, Pullum and Zwickw 1986, Ingrid 1990, and Pollard and Sag 1994. This approach can capture, in a rather straightforward way, our intuitive feeling

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that coordination of two NPs is an NP, of two PPs is a PP, etc. On the other hand, most of the data dis-
cussed in section 1. do not follow from this structure: this is why our approach will consider that conjuncts will each c-
command the other (contra section 1.1.); that there will be no asymmetries of Ross’ type (contra section 1.1.); that there should be no Case variability (contra section 1.6.); etc. In addition, recent developments in the theory of structure of phrases and sentences point to the conclusion that structure involves binary branching (see Kayne 1984, for example). If that is true, then (92) cannot be the correct representation of coordination of adjacent binary branching, recent research has achieved yet another generali-
za
d which radically simplifies the conceptual system of language: that any phrase is headed by a single head, and that every head projects a phrase. If this is true, then, again, the structure in (92) is not a possi-
ble representation for coordination since in it, a single phrase XP can be headed by any number of
XPs.
Lahok and Peters (1969) have a different ver-
sion of multi-headed conjunction structure: (93)

\[
\begin{array}{c}
\text{XP} \\
\text{XP} \\
\text{XP} \\
\text{XP} \\
\text{XP} \\
\text{XP} \\
\end{array}
\]

Their proposal assumes that each conjunct is accom-
panied by an instance of a conjunction. All conjuncts in (93) enjoy basically equal syntactic status. The structure is still multi-headed, and multi-branch-
ing, but it enjoys some advantages over (92). It predicts the possibility of conjunction doubling (as discussed in section 1.5.); it predicts that conjuncts will not c-command each other, as per conclusion in section 1.2.; it predicts that each conjunction can be modified by an adverb (see example (77) in section 1.8.); it predicts asymmetries noticed by Ross (see section 1.1.). In fact, the proposals by Collins (1988a,b) and Progovac (1996,1997) are similar in spirit, as will be discussed in section 3, Part II.

In addition, this approach assumes that one and the same conjunction gets copied in a single coordi-
nation phrase, deriving (93) from (94) below. The spirit of this analysis is adopted by Zorner 1995
(section 3.1, Part II), who provides a syntactic mecha-
nism for achieving the link between equivalents of (93) and (94).

\[
\begin{array}{c}
\text{XP} \\
\text{XP} \\
\text{XP} \\
\text{XP} \\
\end{array}
\]

Any multi-headed analysis of coordination raises the following question: since phrases inherit the features of their heads, what features would a multi-headed phrase inherit in case the conjuncts are not of the same category, as in the examples below. The solution proposed in Gazdar et al. (1985), for example, is that the feature(s) projected to the mother node would constitute the intersection of the features of the daughter nodes (Head Feature Constraint). The main categories are represented using combinations of the binary features N and V, based on Chomsky 1970.

\[
\text{Pat became [NP a Republican] and [VP quite conservative].}
\]

(Stag et al. 1985)

(96)

(97)

(98)

(99)

(100)

(101)

In an analysis that involves tree-pasting, it is not at
all clear why such markers of tree pasting would be ne-
necessary, let alone why they would show such intricate patterns of distribution, as illustrated in the
rest of this section, as well as in the Appendix, Part II.

As pointed out in section 1.8., Collins (1988a,b) argues that conjunctions can be modified by adverbs. This would not be possible if conjunctions were not syntactically present. Next, as also pointed out by Collins, even the conjunction ‘and’ has a clear seman-
tic contribution, identifying a causal/temporal rela-
tionship between conjuncts, as in:

(112)

(113)

(114)

(115)

(116)

To our regret, the last few lines of Chapter 4 of Chris Tappan’s Murder Mystery in Glot International 3, 5 were inadvertently omitted. We print the last few paragraphs here. We apologize to Chris Tappan and to our readers.

“Were those his exact words?” Paul asked her, ignoring her last comment and before she could continue her story.

“Something like that. I think you don’t have enough paper!”

“Then what happened?”

“Se I go in and I was shocked to see that Nartin was angry as hell. I mean, I had not expected this because Bill had made that comment jokingly, and when I had been there before, the atmosphere had been fine, they were sitting there like friends, no animosity. But now, Nartin was fuming. ‘Did you hear what he said’? he asked me. I said, ‘You mean that comment about the paper?’ he said. ‘I could kill him for it!’ he said. ‘I could kill him for it,’ that was his exact words. I could hardly believe what I heard. Especially from Nartin. And I mean, it was only about the paper in the printer!”

“You said that they were talking about the reasons why Nartin did not get the job when you were up there earlier, right?”

“Right.”

“What did they say? What were they talking about?”

“I don’t know, I wasn’t there for a long time, I walked in, and walked out again, right away.”

“So you did not catch anything?”

“As far as I remember, Bill was telling Nartin what all the members of the committee had said. But I really didn’t stay very long.”

“Thanks a lot, Esperanza.” Paul said. “You have been a great help.

“I don’t have enough paper, Paul thought. They had to find Nartin. Right away.”

Where was James?
STRUCTURE FOR COORDINATION

Part II

by Ljiljana Progovac

In Part I, which appeared in Glot International 3–7, I introduced the representative data relevant for determining the structure for coordination. Part I also provided a survey of the analyses of coordination that do not treat conjunctions as heads of conjunction phrases. Part II provides a survey of those analyses of coordination that do treat conjunctions as heads of conjunction phrases. Part II also contains the extensive Bibliography.

3. Conjunction as a head

3.9. Introductory words

The idea that conjunction is a head of a phrase, typically the conjunction phrase (&P), has been explicitly proposed or explored by many, including: Thiersch 1985, Munn 1987a, 1987b, 1992, 1993, Collins 1988a,b, Kolb and Thiersch 1991, Woolford 1987, 1994, Kayne 1994, Johannessen 1990, 1993a–c, 1996, 1998, Zoerner 1995, Camacho 1997, et al. This analysis, of course, became more readily available only with the advent of the X'-theory, somewhere in the late seventies. This basic analysis allows of various specific implementations: conjunctions can be specifiers and complements in a &P with recursive complements (section 3.1); conjunctions can be specifiers and complements in a &Ps with recursive specifiers (3.2); conjunctions can be attached by adjunction (section 3.3); conjunctions can be treated as heads that do not project a &P (section 3.4). The rest of this section provides a brief survey of these analyses.

3.1. Conjunction Phrase (&P) with recursive complement

I discuss in some detail two analyses of coordination that argue that conjunctions are specifiers and complements in &Ps, where the complement is recursive: Johannessen (1998) and Zoerner (1995). These analyses are based on a host of previous papers, including: Thiersch 1985, Munn 1987a, 1987b, 1992, Kolb and Thiersch 1991, Johannessen 1990, 1993c, Grootveld 1992, et al. Since the two analyses share many of the consequences, I will discuss them in parallel.

Johannessen (1998) argues that the non-final conjunctions are specifiers in a conjunction phrase, and that the final conjunction is a complement. This is illustrated in (115) for two-termed coordination, and in (116) for three-termed coordination (note that she uses CoP label for Coordination Phrase):

For Zoerner, in multiple coordination, a single & projects more than one layer of &P structure, in parallel to Larson’s (1988) VP shell proposal (this analysis of coordination was mentioned, but argued against, in Collins 1988a,b). Thus, only one & is generated (as per Lakoff and Peters 1969), the last one, while other & positions in multiple coordination are filled by the head movement of the base-generated conjunction. The basic representation for two-term coordination will be the same as Johannessen’s, the one in (115) above. Below is Zoerner’s analysis of three-term coordination:

The movement of and to e is normally covert; if overt, the emphatic examples like (118) below will be generated (see Appendix for possible semantic contribution of repeated conjunctions). The basic advantage of Zoerner’s proposal is that it predicts that one and the same form of the conjunction has to surface between conjunctions of the same coordination phrase, as illustrated below for English (Zoerner 1995 also offers comparable Japanese data):

Another advantage of Zoerner’s idea is that it provides tools for differentiating sub-group coordination, for which examples above would be grammatical. Thus, actually, if one adopts Zoerner’s structure in (117) for examples (118) or (119), then one can reserve the structure in (116) for sub-group coordination, where Mary and Jim are considered a sub-group, which coordinates with Tom. This would correspond to the fact that different conjunctions are possible with sub-group coordination, since there are two distinct &Ps:

On the other hand, if (116) is the correct representation for a single coordination phrase, then it is not clear how to represent sub-group coordination in a distinct way (see also Kayne’s analysis in section 3.3.1). All other things being equal, it is desirable to have this ambiguity follow directly from the structural representation.

Johannessen/Zoerner type of structure seems supported by the possibility to extrapolate the highest &$, providing evidence for its constituency (see Zoerner 1995):

Zoerner (1995) proposes a hierarchically similar structure, although with an important difference.
phrasal node is a mechanism with no precedent in the theory. Johannessen's proposal insures that a &P whose first conjunct is an NP has the features of an NP, as desired. The plural feature of the conjunction will have to come from the conjunction itself. In addition, this analysis does not force phrases of the same/similar type to coordinate. The strongest argument for her approach is its ability to capture the otherwise problematic asymmetries discussed in section 1.7, Part I (see Gazdar et al. 1985):

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

(128) *You can depend on [that he will be on time].

Since only the features of the first conjunct will be shared by the &P, (127) is grammatical, and it is possible for the other conjunct to take the form that is not selected by the proposition. (128) shows that that-clauses are not selected by the proposition. On the other hand, it is harder for Johannessen's analysis to capture some gender resolutions that occur crosslinguistically, where both conjuncts are taken into account (see e.g. Corbett 1991, Bayer 1996).

While Johannessen's approach successfully treats examples like (127) and (128), it faces the opposite problem: how to exclude impossible cases of coordination (see section 1.7, Part I). Obviously, a separate principle would be needed, possibly an Economy principle introduced in the Appendix. In any event, an approach that overgenerates can be salvaged by identifying an independent principle at work, but an approach that rules out acceptable examples is harder or impossible to salvage.

The X-structure Johannessen and Zoerner propose for coordination implies that the complement will precede the conjunction in verb-final languages, as in (129).

(129) &P

Both authors provide arguments that (129) is correct, based on constituency tests which show that indeed, in verb-final languages, the conjunction forms a unit with the preceding, rather than with the following conjunct. In addition, as pointed out in section 1.5, Part I, the conjunction doubling strategy in OV languages will repeat the conjunction following the last conjunct, rather than preceding the first, as expected under this analysis. Also, the data that served as input for Johannessen's generalization repeated below strongly suggests that a structural difference is involved:

(130) Johannessen's Correlation

There is a very strong correlation between, on the one hand, the order of verb-object, and on the other, that of normal conjunct-deviant conjunct (usually the same as that between those conjuncts).

These consistent differences between head-initial and head-final languages provide the strongest support for the idea that conjunctions are heads of phrases: they follow the pattern of order and constituency established for other (uncontroversial) heads. One puzzle remains, however: the tendency for the conjunction to appear between conjuncts cross-linguistically, avoiding a peripheral position, which tendency is not attested with the verb (cf. e.g. SOV/SVO languages).

As pointed out in section 1.6, Part I, Zoerner and Johannessen make different predictions with respect to deviant Case. Zoerner argues that the conjunction assigns Case to its complement, the final conjunct in VO languages, just like a preposition or a verb would. The particular Case to be assigned will vary from language to language, depending on whether the conjunction is endowed for particular Case assignment by a higher head, or whether default Case choice is available. On the other hand, non-final conjuncts will receive their Case by spec-head agreement with the moved conjunction, which Case need not necessarily coincide with the Case of the final conjunct. Because all non-final conjuncts receive Case through the same mechanism, they all have to have the same Case. Thus, the prediction of Zoerner's analysis is that all non-final conjuncts must have the same Case.

On the other hand, Johannessen argues for a cut-off point between the initial conjunct versus non-initial conjuncts in VO languages. From her Spec-Head agreement analysis it follows that the first conjunct will not receive the deviant Case unless all other conjuncts do.

Going into the deviant Case assignment developed by the two analyses for multiple-term coordination is beyond the scope of this paper, as well as the resolution of the inconsistencies in judging the data, as pointed out in section 1.6, Part I. However, the facts that standard Case can be suspended with coordination at all, and that one can predict which conjuncts will be deviant based on word order, provide strong support for a head-of-nondependence principle for coordination.

3.2. Conjunction Phrase (&P) with recursive specifier

Collins (1988a,b) offers the following structure for coordination, in which each conjunct is a complement in its own &P:

(131) &P

As opposed to the structure proposed by Johannessen or Zoerner discussed in the previous section, the location of recursion in (131) is in the specifier position. Another difference is that the specifier is to the right of &', rather than to the left, as usually assumed for English. Yet another difference concerns the number of &Ps projected per conjunct. According to (131), there are as many &Ps as there are conjuncts. This differs from Johannessen 1998, according to whom the number of &Ps is one fewer than the number of conjuncts. While for Zoerner, the number of &P projections is also one fewer than that of conjuncts, Zoerner assumes that all these projections are only layers of structure projected by a single conjunction. Collins specifically argues that each &P is headed by a distinct conjunction.

Collins does not explain why he wanted his specifiers to be to the right in (131), but I can see the advantage of this approach. First, this enables him to analyze `too' as a specifier of &P. The basic distribution of `too' is given below:

(132) John and maybe Mary went to the store.

This representation would capture the intonation patterns in (132) rather straightforwardly, but will not be able to handle Zoerner's extrapolation example in (126), since the intermediate conjunct here does not form a constituent with the last (but see Kayne 1994 for extraposition). Zoerner's analysis faces a similar question. On the other hand, Zoerner's analysis captures this elegantly. On his account, the last conjunction is the only one generated; the rest are the multiple-term conjunctions in front of the first conjuncts, as in the Conjunction Doubling strategy discussed in section 1.5, Part I.

However, the distribution of overt/covert conjuncts raises a problem. It is not clear why the ultimate head of the highest &P should always be empty, at least in English, while the most embedded conjunction should (always?) be overt (but see Collins' paper for comparing this situation to that of complementizers surfaceing in embedded, but not main, clauses). Johannessen's analysis faces a similar question. On the other hand, Zoerner's analysis captures this elegantly. On his account, the last conjunction is the only one generated; the rest are the multiple-term conjunctions in front of the first conjuncts, as in the Conjunction Doubling strategy discussed in section 1.5, Part I.

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The basic argument is that one can have as many conjunction adverbs as conjuncts. If, as Collins argues, these adverbs modify conjunctions, rather than conjuncts, then it must be that each conjunct is preceded by a conjunction, overt or covert. This analysis would also capture, rather elegantly, the possibility to delete conjunctions in front of the first conjuncts, as in the Conjunction Doubling strategy discussed in section 1.5, Part I.

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establishes that such contrasts are handled in a way that does not invoke either c-command or m-command. This issue deserves further attention. The lack of strict c-command among conjuncts is predicted by both those analyses; if the conclusions of section 1.2 are correct, this remains their important advantage.

However, as they stand now, neither of the two analyses is able to invoke the Spec/Head mechanism of feature sharing, which, to my mind, is the strongest achievement of Johansen's approach. Recall that Johannesen handles subcategorization in a rather straightforward fashion: the features of the first conjunct, the specifier of &P, percolate up &P, by this movement, just as if a conjunct raises at LF to adjoin to the NP in (139), since the expression in exactly the same position in which a single-term NP would. Munn (1993) captures first conjunct agreement data, although at the expense of losing a straightforward explanation for regular agreement patterns (see section 1.4, Part I). It follows from this analysis that the first conjunct c-commands the following conjuncts, as established in section 1.2, Part I, point to the contrary. Munn also addresses the issue of conjunction repetition, as discussed in section 1.5. Part I. His proposal is that the conjunction raises at LF to adjoin to the NP in (139), and that this movement can happen overtly in some languages. One empirical problem with this conclusion is that it fails to capture prosodic requirements of repeated conjuncts, pointed out in section 1.5, Part I. Kayne (1994) adopts the spirit of Munn's analysis, but with one important difference. Since his Antisymmetry approach prohibits adjunction to the right, Kayne argues that initial conjuncts are adjoined to the conjunction phrase, formed with the conjunction and the final conjunct (140). While in Munn's analysis, the second conjuncts are adjoined to the first, in Kayne's analysis the first conjuncts are adjoined to the &P containing the last conjunct.

Kayne's structure is hierarchically parallel to the structure proposed in Johannessn, handling most of the data in the similar fashion. One difference is that extraposition facts are handled in a more straightforward way by Kayne, since the extraposed material is indeed a full phrase, just as in the comment on Collins' and Munn's analyses in the previous sections.

There is a logical possibility for the adjunction analysis of conjunction, i.e., to treat each conjunct as a complement in an &P, where each &P is attached to an abstract head, the situation that resembles an appositive structure. This was proposed in Munn (1993) as a semantic representation for coordination and in Prosgov (1996,1997) for syntactic representation. The advantages of this structure are the following: it captures the lack of c-command among the conjuncts, as established in section 1.2, Part I; it straightforwardly predicts the availability of conjunction doubling strategies, as in section 1.5, Part I; it renders all conjuncts equal in status, in spite of the existence of hierarchy; it predicts deviance in Case assignment to conjuncts, since what receives Case directly is the (null) nominative head. However, this approach faces the following problems: it generates several &Ps, where the presence of one is felt (contrast Zoerner's analysis); it predicts that the last two &Ps cannot extrapose as a unit, contrary to the data presented in section 3.1, which seems to indicate that they do; while Extraordinary Balanced Coordination is not a problem for this approach, Unbalanced Coordination is: since the conjuncts here enjoy the same status, asymmetries in Case assignment among conjuncts are not expected.

3.4. Conjunction: head without a phrase

Camacho (1997) proposes an analysis of coordination which treats conjunctions as heads, but not as heads of &Ps. In an attempt to capture, at the same time, the status of a conjunction as a head, and its lack of relevant features, he proposes the following analysis of coordinating subjects:

(142) TP

\[ \text{Tom and Mary} \]

Like Zoerner's (117), the structure in (142) assumes that a head can project more than one layer of structure. Unlike the approaches outlined in sections 3.1–3.3, Camacho does not postulate the existence of a &P, and allows conjunctions to head the second layer of any predicational projection. This approach seems to capture the bi-sentential ring of examples with coordinated subjects since it posits two TPs with two distinct specifiers. The cameleon-like nature of a coordination phrase follows, too: there is no coordination phrase to begin with.

One potential problem is that coordinated elements are predicted not to form a constituent in this representation (i.e. Tom and Mary in (142)), as pointed out and addressed in Camacho. The constituency effects, such as agreement, binding, pronominal replacement, etc., therefore must be captured in some other way, which puts this analysis at an important disadvantage.

Another problem for this analysis is that the conjunction turns out to be a head with exceptionical nature: first, it is a head which does not have a corresponding phrase, and, second, it is a head which can appear in the head position of any (predicational) projection. This is a constraint that the recent research on coordination has been the opposite: to advance a theory that will render conjunctions unexceptional and comparable to other heads. Camacho's approach makes certain predictions with respect to deviant Case assignment. For example, both NPs in (142) are in a Spec/Head relationship with T, although the instantiations of T are different. It may be argued that a conjunct which is comparable to a finite element occupying T, which cannot assign nominative Case. This would predict that the first conjunct can appear in some kind of default Case, say either Accusative or Nominative. (Notice, however, that this connection to the recent research on coordination has been the opposite: to advance a theory that will render conjunctions unexceptional and comparable to other heads. Camacho's approach makes certain predictions with respect to deviant Case assignment.)
conjunction is in the speech/subject relationship with T, it seems to have no choice but to appear in the Nominative Case, although the Accusative seems widely accepted in the second-conjunct subjects.

4. Concluding remarks

While the theories of coordination are many and various, the weight of evidence seems to push to the following general conclusions: (i) conjunctions are (functional) heads that head Coordination Phrases (&Ps) cross-linguistically; (ii) the first conjunct in (VO languages) stands structurally apart from the rest of the &P, including the conjuction and the rest of conjuncts, although there is no clear evidence that the first conjunct commands the rest of &P; (iii) the conjunction and the non-initial conjuncts (in VO languages) form a structural unit.

At this point it is worth emphasizing that, as far as I can see, all the theories of coordination have contributed to the advancement of knowledge in the area. Even if they were not the ones to propose any of the conclusions that will eventually survive, and even if they argued against such conclusions, various analyses have provided invaluable insights, hypotheses, and data without which advancement would be impossible.

Appendix: ‘Economy of Coordination Marking’ and adjunction

In Progovac (in press; to appear b) I argue that the effects of the CLC are created by an Economy principle, which one can call Economy of Coordination Marking. Roughly put, the principle prohibits the use of an overt conjunction where the two phrases converge without such a conjunction (unless an increase in the event structure is available, as per discussion below). In the following examples, (a) of each pair illustrates an unacceptable instance of coordination; the (b) example offers the reason: the conjunctionless counterpart is available:

(i) 
(a) *John probably and unwillingly went to bed. (Gleitman 1965)
(b) John probably went to bed unwillingly.

(ii) 
(a) *John ate with his mother and with good appetite.
(b) John ate with his mother, with good appetite. (Gleitman 1965)

(iii) 
(a) *The book that I read and about the war.
(b) the book that I read about the war.

(iv) 
(a) *I sat on the couch and with fever.
(b) I sat on the couch with fever.

On the other hand, examples of acceptable coordination in (a) below do not normally have acceptable counterparts without coordination (on the relevant reading), whether they are ‘alike’ or not, as given in (b):

(v) 
(a) *The scene (VP of the movie) and (VP of the play).
(b) *The scene (VP of the movie) (VP of the play).

(vi) 
(a) Bobby is the man (CP who was defeated by Billie Jean) and (CP who beat Margaret).
(b) *Bobby is the man (CP who was defeated by Billie Jean) (CP who beat Margaret).

(vii) 
(a) Pat has become (NP a banker) and (NP very conservative).
(b) *Pat has become (NP a banker) (NP very conservative).

(viii) 
(a) Pat was annoyed by (VP the children’s noise) and (VP that their parents did nothing to stop it.
(b) *Pat was annoyed by (VP the children’s noise) (VP that their parents did nothing to stop it.

The advantage of adopting this principle is that it captures not only the effects ascribed to CLC, but also the counterexamples (see (vii) and (viii)). The principle is also independently motivated and has a wider coverage than CLC; for example, it captures the use of repeated conjunctions for a single coordination, as in (x) below.

(x) 
(a) John, Mary and Peter brought a bottle of wine.
(b) John, and Mary, and Peter brought a bottle of wine.

The contrast between (ix) and (x) indicates that the use of an extra conjuction affects the interpretation in that it enforces the reading of three separate events of wine-bringing (see discussion below). (I am using ‘event’ here as a cover term for both states and events.)

Consider now the data in (xi–xiii). The constructions differ with respect to whether or not they require the overt use of ‘and’ for coordination purposes. Some coordinations can be conjunctionless (paratactic/asyndetic, such as (xii–a); others cannot, such as (x–i) and (xii–a). However, the data below are subject to a clear pattern, formulated in (xiv) as ‘Economy of Coordination Marking.’ The basic claim of the principle is that every (overt) conjunction marker is costly in that it necessarily increases the complexity of the event structure.

(xi) 
(a) *Mary will bring a bottle of wine.
(b) Mary and Peter will bring a bottle of wine.
(c) Both Mary and Peter will bring a bottle of wine.

(xii) 
(a) *[s Mary fulfilled her obligation]; [s she brought a bottle of wine].
(b) [s Mary fulfilled her obligation] and [s she brought a bottle of wine].
(c) Both [s Mary fulfilled her obligation] and [s she brought a bottle of wine].

(xiii) 
(a) *[s Mary fulfilled her obligation]; [cp she brought a bottle of wine].
(b) Mary and [cp she brought a bottle of wine].
(c) Both Mary and [cp she brought a bottle of wine].

(xiv) 
Economy of Coordination Marking:
An extra (overt) conjunction marker signals an increase in the complexity of the event structure, according to the following formula:

Zero-coordination = one participant (one event necessarily): 
1-coordination = two participants (one or two events): 2-coordination = two participants/two events: 

For example, (xiii) involves coordination of clauses. The use of an overt conjunction in (xiii–b) increases the complexity of the event structure: while (xii–a) implies one event (bringing wine), which (same) event is also described as fulfilling an obligation, (xii–b) is unspecified/ambiguous between implying one event (as in (xii–a)) or two (unrelated) events, one fulfilling some obligation or other, and the other of bringing wine. In contrast, (xiii) involves coordination of two verb phrases (VPs). (xiii–b) is the most basic/economical form of occurrence if it is unspecified/ambiguous between one event vs. two event readings. On the other hand, (xiii–c) necessarily implies two events: the event of fulfilling the obligation is distinct from the event of bringing wine. An equivalent pattern is also observed in (xii–c) or two different contextual circumstances will favor one or the other interpretation.) Zero- and 2-coordinations, on the other hand, are not ambiguous: the former, which are appositive in nature, imply one participant, and thus necessarily one event (a examples); the latter imply two events, and thus necessarily two participants (c) examples.

The availability of the Economy Principle in (xiv) makes it possible to argue that adjunction of certain adverbials/adjectivals is an instance of zero-coordination, as in Progovac (in press; to appear b); (see also Haik (1985) and Williams (1990), who analyze adjuncts in parataxic constructions as conjuncts, thus unifying ATB extraction with coordination and adjunction; but see Postal 1994 for criticism). Some modifications of (xiv) are necessary to accommodate adverbials/ adjectivals and their role in the event structure. Among other cross-linguistic curiosities, this move may explain the overt occurrence of a conjunction marker with what are normally treated as adjuncts (see also section 3.4. for a discussion of these):

(xv) 
John read the book and quickly.

This analysis is in consonance with, and draws from, Davidson 1967 and subsequent extensions, such as Parsons 1980, 1990, Dwyer 1989, Higginbotham 1985, and Takahashi 1994, in which adverbials are analyzed as predicates of events, which coordinate with the main predicate.

This is, of course, the direction opposite to the one taken in section 3.3., where conjuncts are analyzed as adjuncts. It is not accidental that there have been attempts to bring conjuction and adjunction under the same umbrella: both are recursive, and both seem deficient without the other. For example, adjunction is the only operation that creates a phrase without a head. If treated as coordination, adjunction phrases would be headed by zero coordination heads.

A Coordination Bibliography

Benmamoun, Elabbas (1992). Functional and


In Functional phonology, Paul Boersma develops a theory that seeks to explain and describe the data of the languages of the world from general capabilities of human motor behaviour and perception. By separating the roles of the articulation and the audition of speech sounds, it predicts and clarifies generalizations about the organization of human speech, and solves several outstanding controversial phonological issues.

Providing a synthesis between the “phonetic” and “phonological” standpoints, the theory of functional phonology expresses explanatory functional principles like the minimization of articulatory effort and the minimization of perceptual confusion directly in a descriptive formal grammar, or offers a typologically and empirically adequate alternative to generative theories of autosegmental phonology and feature geometry. The subjects covered in this book include articulation and perception models, constraint-based accounts of phonetic implementation, the acquisition of articulatory and perceptual phonological feature values, an algorithm for learning stochastic grammars, the construction of phoneme inventories, circular optimization in sound change, and a determination of the fundamental principles that underlie the surface phenomena sometimes ascribed to the primitive phonological operations of spreading and the Obligatory Contour Principle.

This book will appeal to phonologists interested in the possibility that the grammar directly reflects common principles of efficient and effective communication, to phonologists interested in the idea that phonetic explanations can be expressed as constraint interactions in a formal grammar, and to any linguist interested in the innateness debate.