Only asymmetric coordination licenses switch-reference marking: Kĩsêdjê and the two structures of coordination*

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1 Introduction

This paper investigates the locus of recursion in clause combining. I recruit first-hand evidence from *switch-reference* marking in clausal coordination in Kĩsêdjê (a Jê language from Brazil),[1] complemented with second-hand evidence from other switch-reference marking languages, to argue that *symmetric* and *asymmetric* clausal coordination (Lakoff, 1986; Culicover and Jackendoff, 1997; Postal, 1998) have different structures. The structural difference I propose allows me to explain not only the switch-reference evidence alluded to above, but it can also shed light on a broader class of syntactic differences found between symmetric and asymmetric clausal coordination, the most well-studied of which is the Coordinate Structure Constraint (Ross, 1967; Lakoff, 1986; Culicover and Jackendoff, 1997; Postal, 1998).

Clausal coordination is symmetric when the order of the conjuncts doesn't have semantic effects, that is, when conjuncts can be swapped while keeping the truth condition of the original sentence (1-a) and clausal coordination is asymmetric when the order of the conjuncts is semantically relevant, that is, when changing their order results in a sentence with different truth conditions (1-b) (see Ross, 1967; Lakoff, 1986; Culicover and Jackendoff, 1997; Postal, 1998).

(1) *Symmetric* vs. *asymmetric* clausal coordination
   a. Symmetric Coordination (SC)
      (i) Matthew dates a veterinarian and hopes to date a surgeon.
      (ii) = Matthew hopes to date a surgeon and dates a veterinarian.
   b. Asymmetric Coordination (AC)
      (i) You can use this magic herb and get cured of cancer.
      (ii) ≠ You can get cured of cancer and use this magic herb.

*This paper extends and improves on chapters 3 and 4 of my PhD thesis (Nonato, 2014).

[1]Data collected over 6 fieldtrips from 2008 until 2013 in the Ngôjhwêrê village. I would like to thank my main language consultants, Jamthô and Kawiri Suyá.

Kĩsêdjê has clausal coordinators whose morphology indicates whether the subjects of the clauses they conjoin are identical or different (*switch-reference marking*, Jacobsen 1967). The form *ne* of the conjunction is used to conjoin clauses with identical subjects (2), and *nhy* is one of the forms used to conjoin clauses with different subjects (3).

(2) Same-subject "and"
Hẽn [∅ ˈpâj] =ne [∅ khu-ku.]
FACT [3_{nom} arrive] =and.SS [3_{nom} 3_{acc}-eat]
'He_i arrived and (then) he_i ate it'

(3) Different-subject "and"
Hẽn [∅ ˈpâj] =nhy [∅ khu-ku.]
FACT [3_{nom} arrive] =and.DS.3 [3_{nom} 3_{acc}-eat]
'He_i arrived and (then) $he_{j,*i}$ ate it'

Switch-reference marking is restricted to asymmetric coordination, as in examples (2) and (3).[2] In symmetric coordination, such as between clauses 2, 3 and 4 in example (4),[3] switch-reference marking isn't licensed. The conjunction used in symmetric coordination is invariant: even though between clauses 2 and 3 the subject is the same and between clauses 3 and 4 the subject changes, the coordinating conjunction has the same form in each case, *ne*. Note that this symmetric coordinate complex is by its turn asymmetrically coordinated with clause 1. I have specific reasons to exemplify this phenomenon with sentences featuring embedded symmetric coordination, as I detail in section 2.

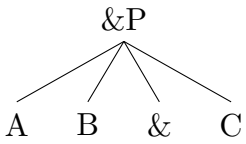
(4) Switch-reference isn't marked in asymmetric coordination
[Hwĩsôsôk kandêjê=ra kôre hwĩsôsôk tá mã pa]$_1$ =n [hwĩsôsôk]$_2$ =ne
[students=NOM 3_{erg} school to go_{pl}] =and.SS [learn] =and
[tá ro sakhre]$_3$ =n [kê hwĩsôsôk jarẽn kandê=ra aj khuktxêrê]$_4$ mã.
[count] =and [also teacher=NOM PL question] FUT
'The students go to school and study, count, and the teacher asks them questions.' i.e. 'The students go to school to study, to count, and for the teacher to ask them questions.'

In this paper, I present first-hand data from Kĩsêdjê supporting the generalization that only asymmetric clausal coordination licenses switch-reference marking. As further support for this generalization, I present second-hand data from other switch-reference marking languages. I explain this phenomenon by proposing that symmetric and asymmetric clausal coordination have different structures. *Symmetric* clausal coordination instantiates a flat structure (5), whereas *asymmetric* clausal coordination instantiates a hierarchical structure (6). This structural difference also allows me to explain another difference found between the two types of clausal coordination, namely, the generalization that syntactic operations applying to symmetric coordination must apply symmetrically to conjuncts (a subcase of which is the coordinate structure constraint).

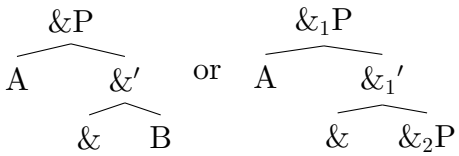
[2]The meaning of each of these sentences includes the information that the event described in the first conjunct is prior to the event described in the second conjunct, and therefore swapping their conjuncts around would change truth conditions.

[3]Clauses 2, 3 and 4 portray separate rationales why students go to school, and could be swapped around without changing the truth conditions of the sentence.

(5) Symmetric coordination: flat structure



(6) Asymmetric coordination: hierarchical structure



The idea that coordination has a flat structure as well as the idea that it has a hierarchical structure aren't new. Among the authors that propose or assume that coordination has a flat structure are included Chomsky (1965), Dik (1968), Goodall (1987), Muadz (1991), Phillips (2003), Takano (2004), Peterson (2004), Wurmbrand (2008), Johnson (2008), and Roeper (2011), and among the authors that propose or assume that coordination has a binary-branching structure are included Yngve (1960), Schachter (1977), Thiersch (1985), Munn (1987, 1993), Kayne (1994) and Zoerner (1995).

The specific contribution of this paper is to argue for a third, maybe surprising view. Both the flat as well the hierarchical structures are instanced. However, each corresponds to a different kind of coordination, with detectable differences in syntax and semantics. Note that I am restricting the discussion to coordination of event-denoting conjuncts (most often, but not necessarily, clauses). I don't believe the same binary distinction applies to coordination of individual-denoting conjuncts (but see Zhang, 2010, for a different point of view).

This paper is organized in the following fashion: in section 2, I discuss data supporting the generalization that switch-reference is only licensed in asymmetric coordination. In section 3, I present a theory of switch-reference computation from which it must follow, given the generalization previously supported, that asymmetric coordination has a hierarchical structure and symmetric coordination has a flat structure. In section 4, I look at other phenomena that also show sensitivity to coordination type, among which the coordinate structure constraint, and derive this sensitivity from the structural difference proposed to hold between asymmetric and symmetric coordination.

2 Switch-reference is sensitive to coordination type

As we saw in examples (2) and (3), repeated below as (7) and (8), in asymmetric clausal coordination in Kĩsêdjê, the coordinating conjunction marks whether the subjects of the conjuncts are the same or different.

(7) Same-subject "and" (copy of (2))
Hẽn [∅ ˈpâj] =ne [∅ khu-ku.]
FACT [3_{nom} arrive] =and.SS [3_{nom} 3_{acc}-eat]
'He_i arrived and (then) $he_{i,*j}$ ate it'

(8) Different-subject "and" (copy of (3))
Hẽn [∅ ˈpâj] =nhy [∅ khu-ku.]
FACT [3_{nom} arrive] =and.DS.3 [3_{nom} 3_{acc}-eat]
'He_i arrived and (then) $he_{j,*i}$ ate it'

In Kĩsêdjê, if the subject of the conjunct following a different-subject marker is nominative, the marker will overtly agree with that subject (9). This type of agreement between switch-reference markers and subjects will feature prominently in the theory of switch-reference I develop in section 3. In these situations, pronominal subjects will usually undergo deletion (see Nonato, 2014, chapter 4, for more on this deletion phenomenon). Example (9) displays a hallmark feature of switch-reference marking: it is *not* only triggered in otherwise ambiguous sentences.

(9) Agreeing different-subject "and"
Hẽn [∅ ˈpâj] =wa [~~wa~~ khu-ku.]
INFL [3_{nom} arrive] =&.DS.1_{NOM} [~~1_{nom}~~ 3_{acc}-eat]
'He_i arrived and (then) $I_{j,*i}$ ate it.'

As we advanced in the introduction, SR is only marked in *asymmetric* coordination. When clauses are coordinated *symmetrically*, the coordinating conjunction has an invariant form notwithstanding whether the subjects of the conjoined clauses are identical or different. I have already supplied an example of that phenomenon (4). For another illustration of this phenomenon, see (10). The first and second clauses of (10) are coordinated symmetrically. Though the subjects (underlined) are different, the same invariant marker we found used in (4) is also employed here, *ne*.[4] The result of the symmetric coordination of the first and second clauses is asymmetrically coordinated with a third clause. In the next paragraph I will explain why I am not presenting a simpler example.

(10) In Kĩsêdjê (Jê, Brazil), switch-reference isn't marked in *symmetric* coordination
[Hwĩsôsôk tá khãm hwysysôm=nda khêt]$_1$ =ne [kê i-khá=ra
[school in mosquito=NOM be.not] =and [also 1_{abs}-shirt=NOM
thyktxi]$_2$ =wa [s-atárá khêrê.]$_3$
be.dirty] =and.DS.1_{NOM} [3_{abs}-put_{emb} be.not]
'At the school there are no mosquitoes and my shirt was dirty and then I didn't put it on.'

The example above features embedded symmetric coordination. It could have seemed more sensible, for presentational purposes, to illustrate the claim that switch-reference isn't marked in symmetric coordination from simpler examples featuring *main clause* symmetric coordination. And indeed, to the extent that main clause symmetric coordination exists in Kĩsêdjê, switch-reference is also not marked in it. I will present the relevant examples now, but will follow them with a cautionary clause.

The structures that translate main clause symmetric coordination in Kĩsêdjê don't mark SR. The invariant conjunction *nenhy* combines the clauses with different subjects in (11) as well as the clauses with same subjects in (12).

[4] Homophonous with the form employed in (2) to mark same-subject, an interesting fact which I am not exploiting here because I haven't been able to find independent reasons to do so.

(11) *nenhy* used for different-subject coordination
[Hwĩsôsôk tá khãm hwysysôm=nda khêrê,]$_1$ nenhy [i-khá=ra
[school in mosquito=NOM not] and [1_{abs}-shirt=NOM be.
thyktxi.]$_2$
dirty]
'There are no mosquitoes at the school and my shirt is dirty.'

(12) *nenhy* used for same-subject coordination
[Khrat wit na wa khu-mba,] nenhy [s-indo=n wa ∅-mbaj
[start only INFL 1_{nom} 3_{acc}-know] and [3_{abs}-end=INFL 1_{nom} 3_{abs}-know$_{emb}$
khêrê.]
not]
'I only understood the beginning and I didn't understand the end of it.'

However, it might be the case that main-clauses (CP's) simply can't be symmetrically coordinated in Kĩsêdjê. It is possible that examples (11) and (12) each contain two separate sentences, the second of which begins with a conjunction. Evidence for that is the pause that obligatorily follows the first clause in those examples, plus the fact that the negation verb *khêrê* in (11) is in its sentence final form (its mid-sentence form is *khêt*). On the other hand, the existence of embedded symmetric coordination, as in examples (1-b).

Finally, note that the impossibility of marking switch-reference in symmetric coordination is so strong that, if we try to force it, we necessarily obtain *asymmetric* coordination. This will happen notwithstanding how marked the resulting meaning turns out to be, as is the case in (13). In this example, the lack of mosquitoes at the school is portrayed as the reason for the shirt being dirty. Clearly a marked meaning, but the only one possible.

(13) Forced asymmetric coordination in Kĩsêdjê
[Hwĩsôsôk tá khãm hwysysôm=nda khêt] =nhy [i-khá=ra thyktxi.]
[school in mosquito=NOM not] =and.DS [1_{abs}-shirtNOM be.dirty.]
'At the school there are no mosquitoes and therefore my shirt was dirty.'

To my knowledge, there are no other studies correlating switch-reference marking and the symmetric/asymmetric distinction in coordination. The literature on switch-reference does provide, however, two kinds of evidence that the sensitivity of switch-reference to coordination type discussed above is not exclusive to Kĩsêdjê.

Firstly, the literature provides negative evidence that switch-reference isn't marked in symmetric coordination. In my survey of the literature, the only kind of coordination I found being marked for switch-reference was *asymmetric* coordination. [5]

Secondly, I was able to find positive evidence that switch-reference isn't marked in symmetric coordination in two other languages. Note that in neither case is the author to be cited employing the distinction symmetric/asymmetric coordination. Indeed, as I

[5]Note, however, that this is not how many of the authors refer to the relevant constructions. In the literature on switch-reference, asymmetric coordination is often named "clause chaining/sequencing". For arguments that there is distinction between clause chaining/sequencing and asymmetric clausal coordination, see Nonato (2014, chapter 3).

already mentioned, no discussion of the switch-reference sensitivity to coordination type was found in the literature. Below I discuss the relevant examples and the terminology used by each author.

MacDonald (1990) provides a sentence from Tauya (TNG, Papua New Guinea) that features clause combining of a kind she calls "listing" (14). Unless there is reason to believe that there is a special listing construction in Tauya, something that MacDonald isn't actually arguing for, this clause-combining construction must be recognized as symmetric coordination (since changing the order of the conjuncts wouldn't seem to result in a sentence with different truth conditions). As we can see in (14), Tauya doesn't mark switch-reference in symmetric coordination. Instead, the language employs neutral morphology homophonous with the same subject markers used in asymmetric coordination.[6]

(14) Symmetric Coordination in Tauya doesn't mark SR

[Aresa	fofe-	]	pa	[Towe	fofe-	]	pa	[Maʔarafa	fofe-	]	pa	[Nowe	fofe-	]			
[A.	come	]	&	[T.	come	]	&	[M.	come	]	&	[N.	come	]			
pa	[Boriye	fofe-	]	pa	[ʔai-i-ʔa.	]											
&	[B.	come	]	&	[do-3P-IND	]											

'Aresa came, Towe came, Makarafa came, Nowe came and Boriye came.'

Broadwell (1997) presents a type of coordination in Choctaw (Muskogean, USA) that he calls "true" coordination, in which switch-reference isn't marked (15). He opposes that construction to another one he identifies as clause chaining, in which switch-reference is obligatorily marked. I believe that by true coordination he means symmetric coordination, since at least judging from the translation of (15) it would seem that changing the order of the conjuncts wouldn't result in a sentence with different truth conditions. As for clause chaining, as I mentioned, there are plenty of reasons to believe it isn't a *sui generis* construction, but rather a misnomer for asymmetric coordination.

(15) Switch-reference isn't marked in Choctaw in symmetric coordination

[John-at	hilha-tok	]	anoti	[Bill-at	taloow-aachih.	]	
[John-NM	dance-PT	]	and	[Bill-NM	sing-IRR	]	

'John danced and Bill will sing.'

(16) Switch-reference is obligatorily marked in Choctaw in asymmetric coordination

a.

[John-at	hiilha	]	-chah	[taloowa-tok.	]		
[John-NM	dance:L	]	-SS	[sing-PT	]		

'John danced and sang.'

b.

[John-at	hiilha	]	-nah	[taloowa-tok.	]		
[John-NM	dance:L	]	-DS	[sing-PT	]		

'John danced and (someone else) sang.'

[6] Neutral morphology for symmetric coordination seems to be commonly homophonous with same-subject morphology in asymmetric coordination. That is not true of the language I mention next, though. In it, symmetric coordination is marked with specific morphology. I believe that even if a cross-linguistic survey revealed that the pattern displayed by Kĩsêdjê and Tauya is a common trend, it would only be revealing a common historical groove, rather than a synchronically significant pattern.

In the next section, I present a theory of switch-reference computation from which, given the fact that switch-reference is only marked in asymmetric coordination, must necessarily follow that asymmetric coordination has a hierarchical structure and symmetric coordination has a flat structure. In section 4, I use this structural difference to explain why the syntactic conditions like the Coordinate Structure Constraint can be violated in asymmetric coordination but never in symmetric coordination.

3 A theory of switch-reference computation

Along the years, multiple theories of switch-reference have been proposed (Finer, 1984, 1985; Collins, 1988; Hale, 1992; Stirling, 1993; Keine, 2013; Camacho, 2010; Nichols, 2000; Georgi, 2012; Assmann, 2012). The proposals can be widely different, but I believe a common issue to most of them is not properly addressing the question of which clause-combining structures are involved in the phenomenon.

Many switch-reference theories assume that switch-reference constructions are adverbial clauses (Finer, 1984, 1985; Camacho, 2010). These theories are too restrictive. Besides adverbial clauses, switch-reference can also appear in asymmetric coordination, as discussed in the previous section, as well as in complement clauses. Hale (1992) discusses these various contexts, and much of the following discussion borrows from him.

Since the syntax of complement clauses is clearer than the syntax of coordination, I base my theory of switch-reference on its instantiation in complement clauses, discussed in section 3.1. In section 3.4, I extend this theory to coordination. Proceeding this way allows me to take a stance on the structure of asymmetric coordination (that must be such that it allows the computation of switch-reference) and symmetric coordination (which must be such that it disallows the computation of switch-reference).

3.1 Switch-reference in complement clauses

In Kĩsêdjê, switch-reference is restricted to asymmetric coordination. I will, therefore, turn to Hopi for examples of switch-reference-marked complement clauses (17).

(17) Switch-reference marked complement clauses in Hopi (Hale, 1992, exs. 1 & 5)

a. Nu' 'as [kweewa-t tu'i-ni-qa-y] naawakna.
I PRT [belt-ACC buy-FUT-NC-ACC:SS] want
'I want to buy a belt.'

b. Nu' ['i pava 'inu-ngam kweewa-t yuku-ni-qa-t] naawakna.
I [my bro me-for belt-ACC make-FUT-NC-ACC:DS] want
'I want my brother to make me a belt.'

Hale (1992) sketches an extension of Finer's (1984) theory to the domains of coordination as well as complementation. The common idea behind theories that descend from Finer (1984) (Collins, 1988; Hale, 1992) is that the functional heads that host switch-reference morphology are subject to binding theory. As functional heads, switch-reference markers are outside the domain of standard binding theory. They are subject to A′-binding theory (Aoun, 1981), an extension of the standard binding theory to A′-positions. Same-subject markers are *anaphors*, and are thus subject to binding

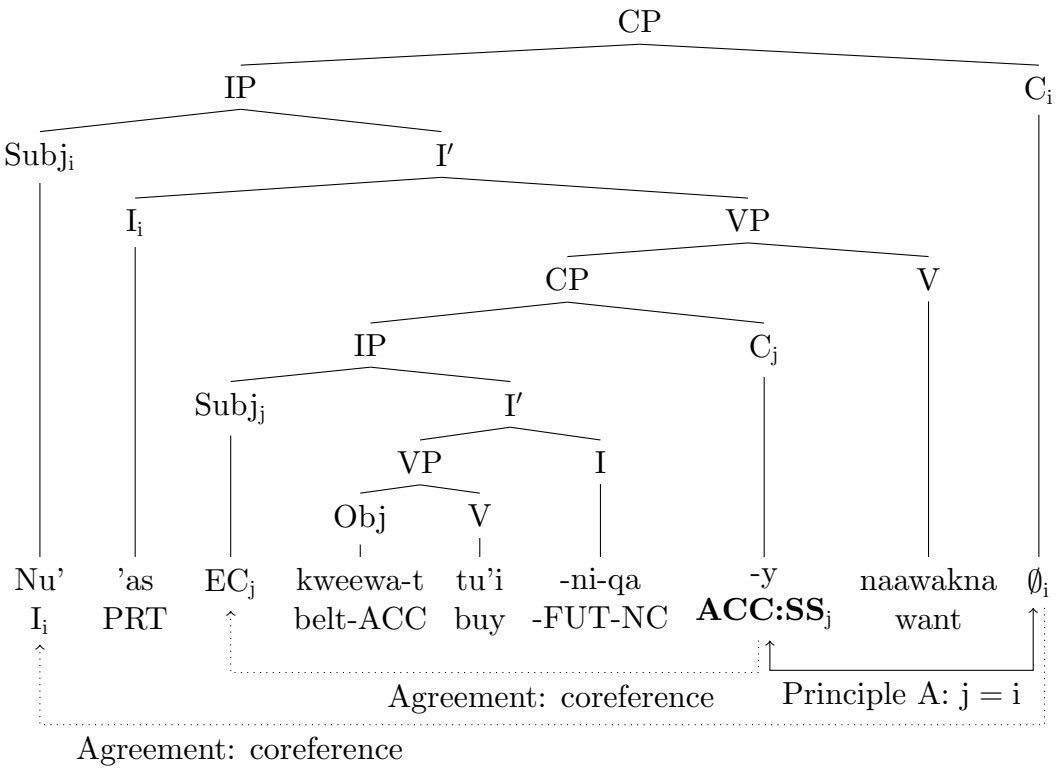
principle A. Different-subject markers are *pronouns*, and are thus subject to binding principle B.

The binding domain of a switch-reference marking head extends up to the immediately superordinate head in A′ position. That head can be another switch-reference marking head or the complementizer that c-commands the whole sentence. Binding principle A forces a *same-subject marker* and the immediately superordinate head in A′ position to be co-referent, whereas binding principle B forces a *different-subject marker* and the immediately superordinate head in A′ position to have disjoint reference.

Essentially, the coreference or disjoint reference relations found between *subjects* of clauses connected with switch-reference markers obtains indirectly. It is parasitic on the coindexation independently found between switch-reference markers and the subject of one of their conjuncts, and between the complementizer that c-commands the whole sentence and the highest subject. Such coindexation relations arguably obtains through agreement, as I discuss in section 3.3. Coreference between the functional heads indirectly forces coreference between the subjects they are coindexed with.

Let me exemplify how such a system generates the obligatory reference relations featured in sentences (17-a) and (17-b). I assume the structure of (17-a) is roughly as in (18) and the structure of (17-b) is roughly as in (19). You will notice I took a few simplifying decisions. They shouldn't interfere with the main workings of the computation of switch reference.

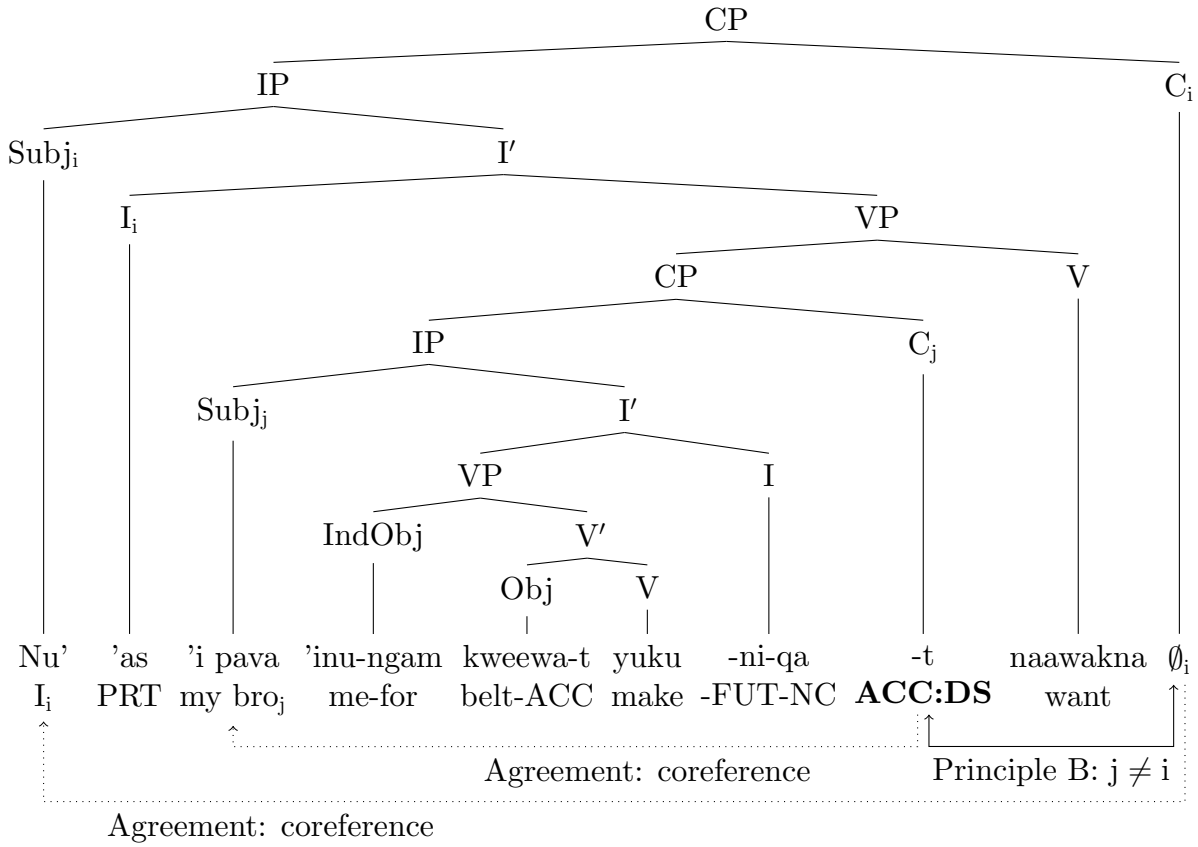
(18) Computation of *same-subject* marking



Principle A requires anaphors such as the same-subject marker in (18) to be coindexed with a c-commanding antecedent in their binding domain. This enforces that the indexes i and j are the same in (18). The subject of the main clause, nu'_i 'I' and that of the embedded clause EC_j must, therefore, be coreferent.

The computation of different subject marking is only minimally different. The structural configuration is exactly the same, but now, since different-subject markers are pronouns rather than anaphors, reference relations are regulated by binding principle B. That principle states that pronouns must not be c-commanded by a coindexed antecedent in their binding domain. For the different-subject marker in (19), that means that the complementizer that c-commands it must not be coindexed with it. Hence, i and j must be different. That indirectly enforces that the reference of the subject of the main clause, *nu'*$_{\text{i}}$ 'I' and that of the subject of the embedded clause *'i pava*$_{\text{j}}$ 'my brother' be disjoint.

(19) Computation of *different-subject* marking



This account of switch-reference marking between embedded complement clause and main clause is parasitic on the existence of a c-command relation between the embedded clause's complementizer (the host of switch-reference morphology) and the main-clause's complementizer. All else being equal, the same mechanism should underlie switch-reference between conjuncts. But before I proceed to extend the theory just outlined to coordination, let me substantiate two fundamental claims of my account: **(a)** switch-reference marking is borne by conjunctions (I discuss that claim in section 3.2), and **(b)** switch-reference markers agree with subjects (I discuss that claim in section 3.3).

3.2 Switch-reference marking is borne by complementizers

Some theories propose that the locus of switch-reference is INFL (Assmann, 2012; Hale, 1992; Nichols, 2000; Camacho, 2010), while others locate it in C (Finer 1984, 1985, mine). Typologically, most of the switch-reference marking languages are strictly head-final, and in such languages linear order alone can't help decide over one or the other proposal. In strictly head-final languages, if the verb is followed by a single functional category, this could arguably be either head-final INFL or head-final C.

However, once we turn our attention to non strictly head-final languages, we will notice that switch-reference markers appear in the position we would expect to find conjunctions. Note, for instance, how the switch-reference marker in asymmetric coordination in Pima (20), Nêlêmwa (21) and Kwaza (22) all consistently appear between clauses, in the exact position we would expect coordinating conjunctions to show up (the verbs in these examples are underlined).

(20) SR in Pima (Uzo-Aztecan, USA, Langdon and Munro 1979, p. 338, ex. 65/66)

a. [Brent 'a-t 'am ṣohñi heg Eric] c ['am keihi heg Sylvia.]
[B. AUX-PERF there hit ART E.] and.SS [there kick ART S.]
'Brent hit Eric and kicked Sylvia'

b. [Brent 'a-t 'am ṣohñi heg Eric] ku-t [heg Eric 'am
[B. AUX-PERF there hit ART E.] and.DS-PERF[7] [ART E. there
ṣohñi heg Sylvia.]
hit ART S.]
'Brent hit Eric and Eric hit Sylvia.'

(21) SR in Nêlêmwa (Austronesian, New Caledonia, Bril 2004, p. 522, ex. 71/72)

a. [I oda Teâ Pwayili shi Teâ Ovaac] xa [(i) khabwe
[3sg go.up Teâ Pwayili side Teâ Ovaac] and.SS [(3sg) say
ushi-n ...]
ben-poss.3sg]
'Teâ Pwayili goes up to Teâ Ovaac and tells him...'

b. [I oda Teâ Pwayili shi Teâ Ovaac] me [i khabwe
[3sg go.up Teâ Pwayili side Teâ Ovaac] and.DS [3sg say
ushi-n a Teâ Ovaac ...]
ben-poss.3sg agt Teâ Ovaac]
'Teâ Pwayili goes up to Teâ Ovaac and Teâ Ovaac tells him...'

(22) SR in Kwaza (Isolate, Brazil, van der Voort 2004, p. 740, ex. 3)
[... 'we karicwa-'na] tja ['a-ete-ta ...]
[bring field-LOC] and.SS [exist-COMMIT-SS]
'...she took (the children) to the old field and they lived there together and ...'

Given this evidence from non verb-final languages plus the default hypothesis that switch-reference in coordination and in subordination are the same phenomenon, I must assume that the locus of switch-reference morphology in subordination is also C. Better than just assuming this would be to actually show that the position of switch-reference in complement clauses in non verb-final languages is compatible with its being in C, but

unfortunately I haven't been able to find non verb-final languages that mark switch-reference in complement clauses. Non verb-final languages that mark switch-reference are rare, as well as switch-reference marking in complement clauses.

3.3 Switch-reference marking conjunctions agree with subjects

As I already mentioned in the introduction, switch-reference markers agree with the subject of the coming clause in Kĩsêdjê (9). Examples of the same kind of agreement in switch-reference marking languages Kanite and Shipibo can bee seen below in (23) and (24) (examples, respectively, from McCarthy 1965 and Baker 2013).

(23) Agreement in number between SS marker and coming subject in Kanite
[A-ke-**no**] [ne-to-**no**] [v-i-e.]
[3-see-**3s**] [eat-fist-**3s**] [go-3s-indicative]
'Having seen it and having eaten, he went.'

(24) Agreement in case between SS marker and coming subject in Shipibo

a. [Yapa payot-a pi-**xon**-ra,] [nokon shino-n e-a
[fish spoil-PTPL eat-**SS.ERG**-PRT] [my.GEN monkey-**ERG** me-ABS
mawa-xon-ke.]
die-APPL-PRF]
'Having eaten spoiled fish, my monkey died on me.'

b. [Saweti oin-**ax**-a,] [Rosa ja kee-nai.]
[Dress see-**SS.ABS**-PTL] [Rosa.**ABS** it want-IMPF]
'Her seeing the dress, Rosa wanted it.'

Agreeing switch-reference markers are very ubiquitous. Table (25) lists some languages whose switch-reference markers display overt subject agreement. In some of these languages, agreement only shows on same-subject markers and, in some, only on different-subject markers.

On this table I further note whether agreement is with the subject of the preceding clause —S_1— or the subject of the coming clause —S_2. It could seem that such a distinction is opaque in same-subject situations, but it isn't. For instance, the co-referential subjects of the combined clauses can be marked with different cases, as in Panoan languages —see, for instance, (25). Under such conditions, it is clear which subject the marker agrees in case with.

(25) Case agreement between SS marker and subject of coming clause in Shipibo

a. SS marker agrees with pro-dropped ergative subject of coming clause
[Ea-ra ka] -kin [mananxawe b(i)-íba-ke.]
[I.ABS-DIR.EV go] -SIMUL.ERG.SS [turtle find-RCNT.PAST-PERF]
'When I was going away, I found a turtle.'

b. SS marker agrees with pro-dropped absolutive subject of coming clause
[En-ra atsa pi] -i [ka-ke.]
[I.ERG-DIR.EV yucca eat] -SIMUL.ABS.SS [go-PERF]
'When I was eating yucca, I left.'

For languages where verbs normally agree with their subjects, there is the extra complication of determining whether the agreement that we see is verbal agreement or agreement on the switch-reference markers. Languages of this kind were only added to the table below if they employed different sets for each case. In some languages of this type, same-subject situations are marked by the deletion of all verbal agreement. I notated this strategy below as ~~AGR~~. Agreement only in case is marked as K and agreement only in number as #.

I believe the evidence is sufficient to assume that agreement between switch-reference markers and subjects occurs in every switch-reference marking language, even if it is not overt, as is the case, for instance, in *same-subject* marking in Kĩsêdjê.

Language	Family	Agreement on SS	Agreement on DS	References
Kĩsêdjê	Jê		S_2	Nonato (2014, chapter 4)
Apinayé	Jê		S_2	Waller (1974) and Oliveira (2005)
Kashibo	Panoan	K_2		Zariquiey (2011)
Shipibo	Panoan	K_2		Camacho (2010) and Baker (2013)
Yawanawa	Panoan	K_2		*Souza, p.c.*
Amele	Papuan	S_1	S_1	Roberts (1988)
Kwaza	Isolate	S_1		van der Voort (2004)
all	Misumalpan	~~AGR~~	S_1	Hale (1992)
Udihe	Altaic	#	S_1	Nikolaeva and Tolskaya (2001)
Lenakel	Austronesian	~~AGR~~		Comrie (1983) and Lynch (1983)
Tairora	Trans New Guinea		S_2	A. Vincent and L. Vincent (1962)
Kanite	Trans New Guinea		S_2	McCarthy (1965)
Kobon	Trans New Guinea	S_1	S_1	Comrie (1983)
Mian	Trans New Guinea	S_1	S_1	Fedden (2011)
Tauya	Trans New Guinea	~~AGR~~		MacDonald (1990)
Usan	Trans New Guinea	~~AGR~~		Reesnik (1983)
Hua	East New Guinea		S_2	Reesnik (1983)
Fore	East New Guinea		S_2	Reesnik (1983)

S_1: agreement with subject of clause to the left;
S_2: agreement with subject of clause to the right;
K_1: agreement only in case with subject of clause to the left;
K_2: agreement only in case with subject of clause to the right;
#: agreement only in number with the subject;
~~AGR~~: supression of agreement morphology.

Table 1: Languages that have agreement on SR

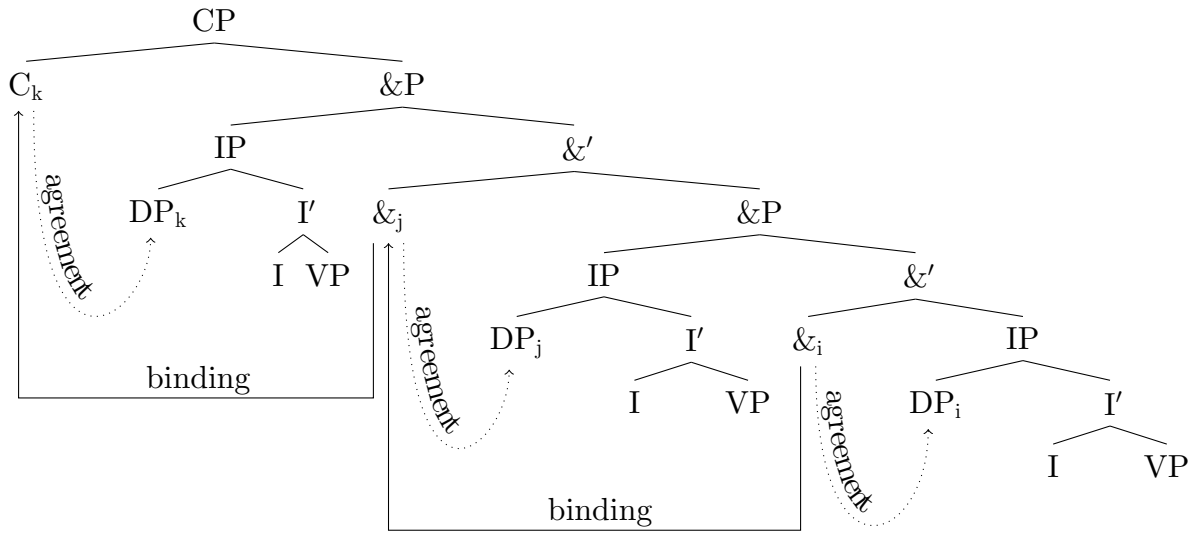
3.4 Switch-reference between coordinated clauses

Given the assumption that switch-reference is the same syntactic phenomenon whether found in complementation or coordination, the same system must be responsible for the computation of switch-reference between complement and main clause and between conjuncts in coordinate structures. In section 3.1, I developed a system for computing

switch-reference between complement and main clauses. Since the structural relationship between complement and main clauses is better understood than that between conjuncts in coordinate structures, it made sense to first develop this system in the context of complementation. In extending the same system to coordinate structures, I will need to make some specific assumptions with regards to the structure of coordination. I see that as a welcome result: the study of switch-reference is thereby shedding light on the structure of coordination.

The same structural relation that obtained between embedded- and main-clause conjunctions in (18) and (19) must also obtain between coordinating conjunctions in asymmetric coordination. Asymmetric coordinating conjunctions must, furthermore, also agree with the subject of their complement clauses. A structure that satisfies these requirements is shown in (26). This structure is similar to the one Zoerner (1995) proposes for coordination. Note that though the particular tree in (26) instantiates IP coordination, the same system is capable of computing switch-reference between vPs.

(26) Computation of switch-reference in coordination

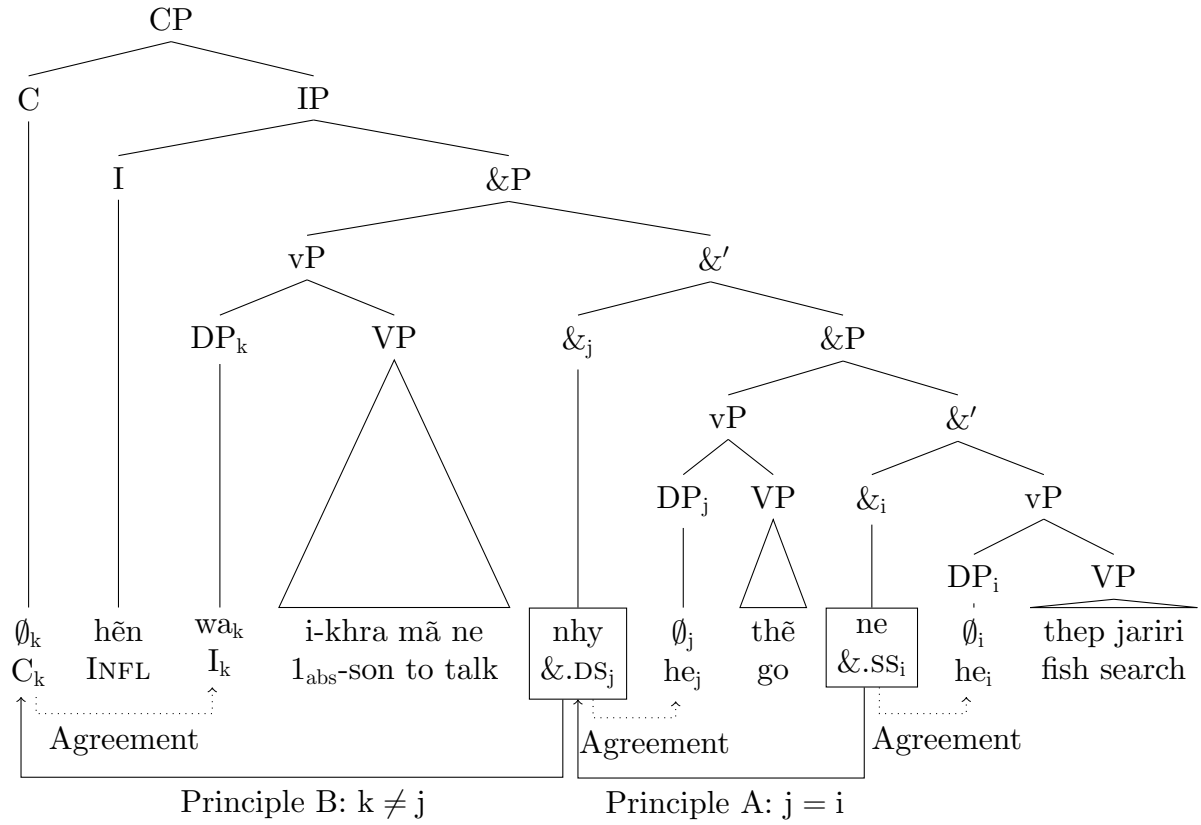


The Kĩsêdjê sentence (27) has a structure like that represented in (26). The only difference between (26) and the structure of (27) is the fact that (27) is vP- rather than IP-coordination (see Nonato, 2014, chapter 3). This difference is orthogonal to the structural relations holding between conjunctions, though.

(27) Three-clause coordination in Kĩsêdjê
Hẽn [wa i-khra mã ne] [=nhy thẽ] [=n thep jariri.]
FACT [1$_{nom}$ 1$_{abs}$-son to talk] [=and.DS.3$_{nom}$ go] [=and.SS fish search]
'I talked with my son and he went and looked for fish.'

The structure of (27) is represented in (28). Each complementizer (main clause complementizer as well as coordinating conjunctions) agrees with the closest c-commanded subject, thereby acquiring its index. The coordinating conjunctions —inside the boxes in (28)— host switch-reference morphology, and therefore can be either pronominal *(different-subject markers)* or anaphoric *(same-subject markers)*.

(28) Structure of (27)



Since the first coordinating conjunction, *nhy*, is pronominal, Binding Principle B requires it to have a different index than the conjunction that c-commands it within its domain. That indirectly ensures that the higher subject —*wa* 'I'— and the intermediary subjects —∅ 'he'— aren't coindexed. The second coordinating conjunction, *ne*, is anaphoric, and by Binding Principle A needs to be coindexed with a conjunction that c-commands it within its binding domain. That conjunction is *nhy*. Coreference between the conjunctions indirectly ensures that the intermediary and the lower subjects are also coreferent.

In order for switch-reference to be computed as proposed above, asymmetric coordination must have a hierarchical structure in which coordinating conjunctions take a conjunct for complement and another conjunct for specifier. I propose that coordination of more than two clauses consists of embedding a coordinate phrase as the complement of another coordinate phrase, as represented in (26).

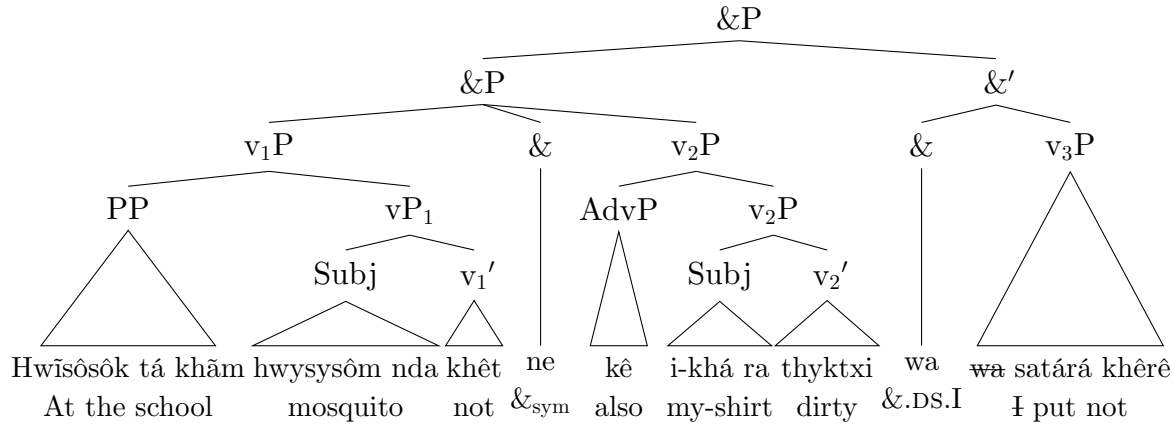
This structure allows a switch-reference marking conjunction to c-command the subject of one of its conjuncts and to have the subject of its other conjunct and itself c-commanded by a higher switch-reference marking complementizer or the complementizer of the main clause. These are the relations exploited in the switch-reference theory proposed in section 3. Since symmetric coordination doesn't license switch-reference marking, it must be the case that such syntactic relations don't obtain in symmetric coordination, that is to say, symmetric coordination must have a flat structure.

The sentence I used to illustrate that switch-reference isn't marked in symmetric coordination was (10), repeated below as (29). The structure of the relevant part of

example (10)/(29) would be as in (30). This structure is chosen so that the structural relations necessary for marking switch-reference between clauses 1 and 2 don't obtain, and the conjunction combining these clauses just can't mark switch-reference.

(29) In Kĩsêdjê (Jê, Brazil), switch-reference isn't marked in *symmetric* coordination
[Hwĩsôsôk tá khãm hwysysôm=nda khêt]$_1$ =ne [kê i-khá=ra
[school in mosquito=NOM be.not] =and [also 1$_{abs}$-shirt=NOM
thyktxi]$_2$ =wa [s-atárá khêrê.]$_3$
be.dirty] =and.DS.1$_{NOM}$ [3$_{abs}$-put$_{emb}$ be.not]
'At the school there are no mosquitoes and my shirt was dirty, and then I didn't put it on.'

(30) Structure of (10)/(29)



4 Other phenomena sensitive to coordination type

In the previous section, I exploited the fact that switch-reference isn't marked in symmetric coordination to propose that symmetric coordination has a flat structure. More specifically, I argued that by attributing to symmetric coordination a flat structure we can straightforwardly account for the fact that switch-reference marking isn't licensed in this type of coordination.

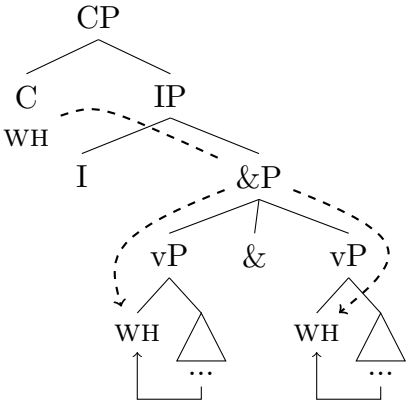
A flat structure disallows agreement between the coordinating conjunction and the subject of one of the conjuncts. The reason is the following: since the symmetric conjunction c-commands *all* of its conjuncts, it is impossible for it to "pick" a single conjunct to agree with the subject of. According to the model laid out in section 3, switch-reference computation is parasitic on such agreement relation. If it can't be established, switch-reference can't be computed.

Essentially, I am proposing that conjuncts in symmetric coordination are unordered. Since a coordinating conjunction can't single out one of its conjuncts to the exclusion of the others, no agreement can obtain. The fact that conjuncts in flat coordination are unordered can also explain why the only way to extract a constituent from within symmetric coordination is across-the-board.

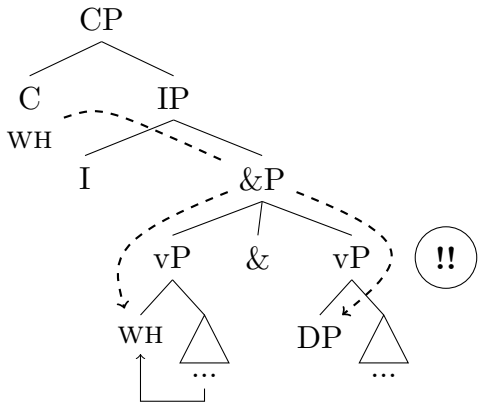
4.1 Across-the-board extraction from symmetric coordination

A probe can only match into a symmetric coordinate complex if: **(a)** it matches inside every conjunct, and **(b)** the elements matched are in the same structural position in each conjunct. Both requirements are fulfilled in (31). If a probe doesn't match inside every conjunct, as in (32), the match fails. I propose that the reason for this behavior is the following: there are actually no branching paths in the syntax of (31) and (32). In either case, all syntax sees is a single path going from the probe in C to the specifier of vP, even though that path will match two positions in the tree.

(31) Successful probing into symmetric coordination

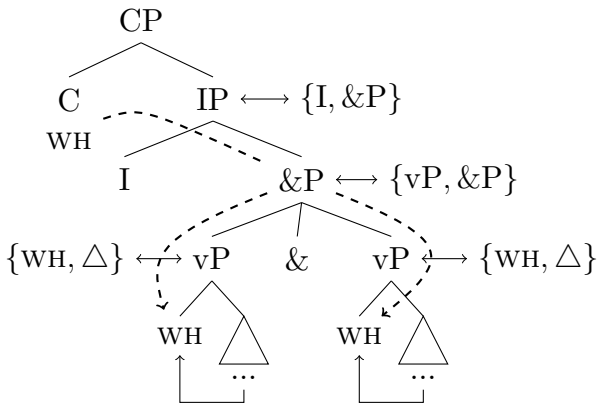


(32) Failed probing into symmetric coordination

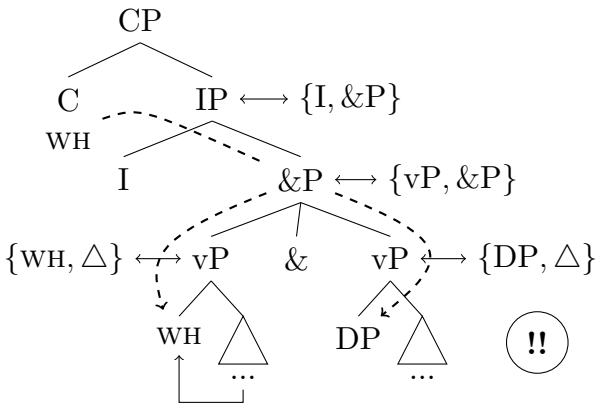


To understand why syntax sees a non-branching path, it is useful to follow the movement of the probe. In both (31) and (32), the probe is the WH feature under C. Below I repeat (31) and (32) as (33) and (34), adding beside each node its set representation.

(33) Successful probing into symmetric coordination



(34) Failed probing into symmetric coordination



For concreteness, I am assuming that probes first check atomic members and only then non-atomic members of a set. The WH probe goes into C's sister, IP, which consists of the set $\{I, \&P\}$. It probes the atom I and, since it doesn't match, it goes into &P. &P

is the set {vP, &}. The item vP in that set corresponds to both the right-hand side vP as well as the left-hand side vP in tree (33). This is so because we are representing branching nodes as sets, and by axiom {a, b, b} = {a, b}. The WH probe tries to match & and fails, trying vP next.

At this point, the derivation proceeds differently in each situation. For (33), vP is the set {WH, △}, and therefore the probe matches WH. For (34), vP is not uniquely identifiable, and so the operation fails.

The only situation in which a probe can match inside some conjuncts but not inside others is if the coordinate complex is *asymmetric*. I will discuss, in the next section, how this behavior stems from the hierarchical structure of asymmetric coordination.

4.1.1 Non-ATB extraction from asymmetric coordination

Non-ATB extraction is only possible from asymmetric coordination, as illustrated by (35).[8] This is usually taken to be surprising, since the Coordinate Structure Constraint seems to be obeyed in symmetric coordination even in languages that don't display any other island constraints.

(35) Extraction in violation of the Coordinate Structure Constraint (Ross, 1967)

a. The CSC can be violated in **asymmetric** coordination
I wonder [$_{DP}$ what kind of herb] you can use t and get cured of cancer.

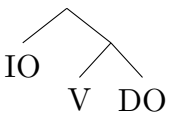
b. The CSC can't be violated in **symmetric** coordination
* I wonder who Matthew dates t and hopes to date a surgeon.

The reason why the CSC is obeyed in symmetric coordination was explained above —the flat structure of symmetric coordination doesn't permit probes to distinguish between conjuncts. In the case of asymmetric coordination, its $\bar{X}$ structure doesn't block extraction from a single conjunct. Indeed, what is surprising in the case of asymmetric coordination is the fact that it is *also* possible to extract across-the-board from it!

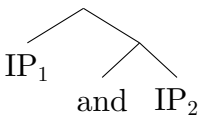
Let me explain: since asymmetric coordination has the same $\bar{X}$ structure as ditransitive VPs (36), the possibility of extracting from a conjunct but not from another conjunct of asymmetric coordination is as natural as the possibility of extracting from an object but not from another object of a ditransitive VP (37).

(36) Asymmetric coordination has the same structure as ditransitive VPs

a. Ditransitive VP



b. Asymmetric coordination



[8] This is not true in every language. It isn't true, for instance, in French (Postal, 1998, p. 75). But, as expected, it is true in some switch-reference marking languages. See Nonato (2014, ch. 3) for data, which I don't introduce here for reasons of space.

(37) Extraction from a single object of a ditransitive verb

What did he tell [you] [the pirate hid t in the castle] ?

Though I don't have an explanation for why ATB extraction from asymmetric coordination is possible, I would like to show that it is not the same phenomenon as ATB extraction from *symmetric* coordination. The latter is due to the structural restriction I detailed above, whereas apparent ATB extraction from asymmetric coordination has the same properties as parasitic extraction. The next section develops this statement.

4.2 Parasitic gap extraction and ATB extraction

ATB extraction from symmetric coordination allows sloppy reconstruction, whereas Parasitic gap extraction and apparent ATB extraction from asymmetric coordination don't allow sloppy reconstruction. Let us look at the relevant data

When a constituent is extracted ATB from two conjuncts in symmetric coordination, as in (38-a), it can be reconstructed to both extractions positions, resulting in a reading where two different pictures are under discussion —a picture of Peter and a picture of John. Given that reading, a clarification remark like (38-b) sounds natural.

If, on the other hand, a constituent is apparently extracted across-the-board from two conjuncts that stand in asymmetric coordination, as in (39), it can be reconstructed only to gap in the first conjunct. In this case, it can't be true that there are two pictures under discussion, and this is the reason why a clarification remark of the form (39-b) sounds odd.

(38) ATB extraction from **symmetric** coordination: sloppy reconstruction

a. I wonder [which picture of himself] Peter likes t and John hates t.

b. Peter likes THIS picture of himself and John hates THAT picture of himself. (Haïk, 1985, p. 286)

(39) Apparent ATB extraction from **asymmetric** coordination: no sloppy reconstruction

a. I wonder [which picture of himself] Bill showed John t and John destroyed t.

b. #Bill showed a picture of himself in high school and, reminded of his shameful past, John destroyed a picture of himself taken the same year.

As you can see in (40), parasitic extraction patterns with apparent ATB extraction from asymmetric coordination in that it also doesn't license reconstruction to both gaps. Reconstruction must be only to the real gap, this being the reason why a clarification remark like (40-b) sound odd.

(40) **Parasitic** extraction: no sloppy reconstruction (Haïk, 1985, p. 286)

a. I wonder [which picture of himself] Bill showed John t before John destroyed *pg*.

b. #John looked at THIS picture of himself before Peter destroyed THAT picture of himself.

Apparent ATB extraction from asymmetric coordination also patterns with parasitic extraction in only licensing extraction under certain conditions. In particular, asymmetric coordination doesn't license extraction of non-NPs or extraction from anti-pronominal

contexts. This is also true of parasitic extraction (as noted by Postal, 1993). The relevant data is in (41) and (42).

(41) Only NPs can be extracted from parasitic gaps or asymmetric coordination

a. *symmetric* coordination: ✓AdvP extraction
Tell me [$_{\text{AdvP}}$ how sick] John was t yesterday and Peter was t last month?

b. *asymmetric* coordination: *AdvP extraction
Tell me [$_{\text{AdvP}}$ how sick] John arrived home t (*and his wife immediately got t).

c. *parasitic gap*: *AdvP extraction
Tell me [$_{\text{AdvP}}$ how sick] John arrived home t (*before his wife immediately got *pg*).

(42) Extraction from parasitic gap and asymmetric coordination can't proceed from anti-pronominal contexts

a. Anti-pronominal context
He dyed his beard green/that color/*it.

b. ATB extraction from anti-pronominal context in *symmetric* coordination
[the red] that the Germans paint their houses t and the French paint their furniture t.

c. *ATB extraction from anti-pronominal context in *asymmetric* coordination
[the red] that the sailors (*saw t in Brazil and) told their kings to dye their coats t.

d. *Extraction from anti-pronominal context in *parasitic gap*
[the red] that the sailors saw *pg* in Brazil before telling their kings to dye their coats t.

The observation that parasitic gap extraction patterns with apparent ATB extraction from asymmetric coordination but not with ATB extraction from symmetric coordination sheds new light on a debate from the early nineties. Williams (1990), among others, argued that parasitic gap extraction was the same phenomenon as ATB extraction. Postal (1993) showed, however, that the constructions have different properties. Though he didn't make it explicit, Postal appears to only have looked at ATB extraction from symmetric coordination. Once we control for coordination type, as I did above, we can understand that he was only partly right.

5 Conclusion

The correlation between the asymmetric/symmetric semantic distinction and the possibility of applying asymmetric operations to conjuncts was exploited in this paper to argue for different structures for symmetric and asymmetric coordination. The asymmetric operations exploited here were switch-reference marking (section 3), extraction from coordination (section 4.1) and reconstruction into coordination (section 4.2). I proposed that we can account for this interesting correlation by attributing to symmetric coordination a flat structure and to asymmetric coordination a hierarchical structure.

This paper paves the way to asking an interesting empirical question: is this correlation between the symmetric/asymmetric semantic distinction and the possibility

of applying asymmetric operation to coordinated clauses also found in some of the clause-combining constructions that have been identified as *parataxis*? If so, it would constitute evidence that asyndetic clause-combining can't be always held synonymous with parataxis. If an instantiation of the construction displays the same properties as coordination, then it must be coordination, and instance the structural complexities detailed here.

There is a host of interesting theoretical questions that for reasons of space couldn't be explored in this paper. In particular, the flat structure proposed for symmetric coordination is incompatible with the hypothesis that binary merge is the only structure-building operation available in syntax (Chomsky, 1995). I also didn't touch on the subject of non-clausal coordination, in which domain there also has been arguments for binary-branching was well as flat structures (see Progovac, 1998a,b, for a survey).

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