

THE SYNTACTIC DERIVATIONS OF SPLIT ANTECEDENT RELATIVE CLAUSE CONSTRUCTIONS*

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ABSTRACT

In this paper, I propose a syntactic derivation for Split Antecedent Relative Clause Constructions such as *Mary met a man and John met a woman who knew each other well*. I claim that the two antecedents of such a construction are originally two conjuncts of a coordinate nominal. Then each has undergone a sideward movement, landed in a new working site, and been selected by a verb. After that, a coordinate clausal complex is constructed. In the old working site, a complex nominal is also constructed, in which the relative clause takes the remnant coordinate nominal as its antecedent. Finally, the complex nominal adjoins to the coordinate clausal complex. This analysis shows how the freedom in the selection of the landing site gained from sideward movement makes the syntactic derivations of this special type of relative clause construction possible, while at the same time avoiding the problems of the alternative three-dimensional analysis.

Key words: split antecedent, relative clause, sideward movement, coordination

1. INTRODUCTION: THE SPLIT ANTECEDENT RELATIVE CLAUSE CONSTRUCTION

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In this paper, we examine constructions such as (1), where a relative clause (RC) seems to have split antecedents (Ross & Perlmutter 1970).

- (1) a. John saw a man_i and Mary saw a woman_j [who_{i&j} were wanted by the police].
b. Mary met a man_i and John met a woman_j [who_{i&j} knew each other_{i&j} well].
c. John saw a man_i and Mary talked to a woman_j [who_{i&j} were wanted by the police].
d. A man_i came in and a woman_j left who_{i&j} knew each other well.
e. A man_i came in and a woman_j left who_{i&j} were quite similar.
f. The house has a room_i and the shop has a cellar_j [which_{i&j} are joined by a small underground passageway].

In (1a) through (1e), the antecedent, or Head, of the RC seems to be split into two DPs: *a man* and *a woman*, and the two DPs are distributed in the two matrix clauses respectively.¹ Each of the two nominals is singular, but the relative pronoun (RP) triggers the plural agreement in the RC. In (1a), for instance, *who* triggers the plural form *were* rather than the singular *was*. Similarly, in (1f), the antecedent of the RC is split into two DPs: *a room* and *a cellar*, and the two nominals are distributed in the two matrix clauses respectively. Both *a room* and *a cellar* are singular, but the RP triggers the plural agreement in the RC. In such examples the RPs *who* and *which* seem to have split antecedents. The RP can also function as a subject of a collective predicate, such as *knew each other well* in (1b). I call the constructions Split Antecedent Relative Clause Constructions (SAC, henceforth).

SACs have been claimed to be problematic for syntactic theories of RCs (Alexiadou et al. 2000: 13). The RCs in SACs are not adjacent to their antecedents. However, the constructions cannot be generated by

¹ I use “Head” to refer to the modified nominal of a RC. For instance, *the man* in *the man who came* is such a Head. Such a nominal is also called antecedent or “Head nominal.” At the same time, I also keep the term “head” to describe the projecting element of a syntactic constituent.

either extraposition or deletion of the RCs. This is because the occurrence of relational expressions such as *similar*, *each other*, *join* indicates that the RCs must be semantically related to the multiple Heads simultaneously. For instance, (1a) cannot be derived from either (2a) or (2b). The extraposition in (2a) is not possible because the RC in the trace position is not well-formed, since *each other* is not licensed by any c-commanding plural element in the local domain. The deletion in (2b) is not possible since the RC is not well-formed before it is deleted, either. The reciprocal *each other* is not licensed by any c-commanding plural element in the local domain.

- (2) a. *Mary met a man_i t_k and John met a woman_j [who_{i&j} knew each other_{i&j} well]_k.
 b. *Mary met a man_i [who_{i&j} ~~knew each other_{i&j} well~~] and John met a woman_j [who_{i&j} knew each other_{i&j} well].

As claimed by Gazdar (1981: 179), the RCs in SACs “must be generated in situ.” If so, the base-position of the RCs and at least one of their antecedents are not adjacent, unlike regular RC constructions. Now the question is: are SACs still RC constructions? If they are not RC constructions, they might be derived in some other way, such as the way in which a depictive construction is derived. In (3), the depictive *young* modifies the subject *he*, but the two elements are not adjacent.

- (3) He died young.

In this paper, I will propose that SACs are derived from regular RC constructions. What is special about the constructions is that the two antecedents of an SAC have undergone a sideward movement from a coordinate complex. My analysis will show how the freedom in the selection of the landing site gained from the sideward movement makes the syntactic derivations of this special RC dependency construction possible, while avoiding the problems of an alternative approach.

The structure of the paper is as follows. In Section 2, I argue that the apparent two antecedents of an SAC originally form a coordinate complex, and the complex is the real antecedent of the RC. In Section 3, I propose that the observed splitting effects of SACs are syntactically

derived by the sideward movement of the conjuncts of the coordinate complex identified in the previous section. In Section 4, I point out certain disadvantages of an alternative analysis. In Section 5, I discuss a parallelism requirement for SACs. Section 6 is a brief summary.

2. THE HIDDEN COORDINATE DP COMPLEXES OF SACs

2.1 Proposal: SACs Have Coordinate Antecedents

We claim that the derivation of an SAC contains a step where the two apparent antecedents are two conjuncts of a single coordinate complex, and it is this complex that is the real and unique antecedent of the RP.

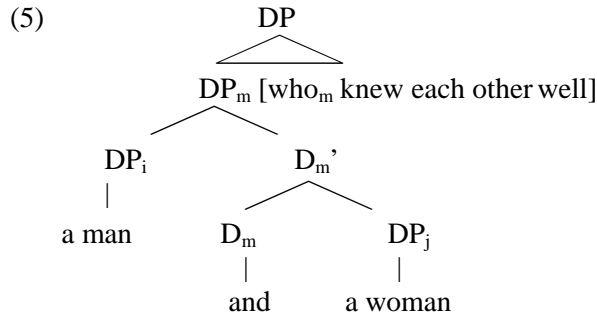
In data such as the following (4), RCs take a coordinate Head (Vergnaud 1974, Jackendoff 1977: 190, Link 1984). Such data are different from SAC data in that the antecedents are not “split” into two matrix clauses.

- (4)
- a. a man_i and a woman_j [who_{i&j} knew each other_{i&j} well]
 - b. a man_i and a woman_j [who_{i&j} were wanted by the police]
 - c. a room_i and a cellar_j [which_{i&j} are joined by a small underground passageway]
 - d. the boy_i and the girl_j [who_{i&j} were in love]
 - e. the car_i and the truck_j Op_{i&j} that collided

Moltmann (1992) calls both the RC in data such as (4) and the RC in SACs multiply- Headed RCs. We call the construction where a RC takes a coordinate Head, such as those in (4), a Coordinate-Head RC Construction (CHC).

Assume that a coordinate construction is headed by a conjunction and the two conjuncts are the Spec and Complement of the head, and the category of the head is identical to that of the conjuncts (Johannessen 1998, Zhang 2006, 2007). We can thus claim that the structure of (4a), for instance, is the following:²

² In CHCs, the status of the RC is not important. Other types of phrases can also be merged with a coordinate DP. In (i), the phrase to the right of the coordinate DP is a PP



In this structure, DP_m is a coordinate antecedent of the RC. We claim that the antecedent of the RC of an SAC is also a coordinate DP. There are two major differences between SACs and CHCs. First, D_m in SACs is realized by a null conjunction, whereas it is realized by *and* in CHCs. Second, the two DP conjuncts are re-selected by two verbs separately in SACs, but not in CHCs. We will present a full-fledged syntactic derivation of SACs in Section 3. In the present section, showing the syntactic similarities between CHCs and SACs, we argue for the claim that in both constructions the RC takes a single coordinate DP complex as Head, and thus the RC is not syntactically multiply-Headed.

We now present our arguments for our unified approach to CHCs and SACs.

2.2 Argument: Restrictive Modification Constructions

A well-established constraint on restrictive RCs in English is that they do not take proper names or pronouns as antecedents in the absence

modifier; and in (ii), the phrase to the right of the coordinate DP is a complement (Jackendoff 1977: 191-192). The frame of our structure in (5) is general enough to cover all of these data.

- (i)
 - a. the boy and the girl [with the same birthday]
 - b. the boy and the girl [with the mutual interest]
 - c. the boy and the girl [with different-colored eyes]
 - d. the boy and the girl [with a common background]
- (ii)
 - a. three students and two teachers [of the same language]
 - b. three members and two vice-chairmen [of interlocking committees]

of any article (see Jackendoff 1977: 171), as shown in (6a) through (6d). The example in (6e) further shows that a pronoun cannot be included in the Head of the RC.

- (6) a. *Pat { who/that } I like is a genius. (Sag 1997 (91))
b. The Pat { who/that } I like is a genius.
c. *He { who/that } I know is a genius.
d. *Mary met [him]_i [who_i knew her well].
e. *I saw [him and the man]_i who_i were late yesterday.

This constraint is not seen in non-RC modifiers such as depictives. In (7), the depictive *young* may modify the pronoun *he* or proper name *Pat*.

- (7) {The mand/He/Pat} died young.

Both CHCs and SACs are restrictive modification constructions. In English, this means that neither a CHC nor an SAC may allow proper name or pronoun antecedents. Wilder (1999: 2.1) notes that neither of the assumed antecedents of SACs can be a pronoun, as shown in (8a). It is obvious that this is also true of CHCs, as seen in (8b).

- (8) a. *Mary met [him]_i and John met [a woman]_j [who_{i&j} knew each other well].
b. *[he]_i and [a woman]_j [who_{i&j} knew each other well]

Parallel to this pronoun constraint, there is also a proper name constraint on the antecedents of both CHCs and SACs:

- (9) a. *Mary met Bill_i and John met [a woman]_j [who_{i&j} knew each other well].
b. *[Bill]_i and [a woman]_j [who_{i&j} knew each other well].

The impossibility for pronouns and proper names to be antecedents of CHCs and SACs indicates that the RCs in both constructions are

restrictive. If the two types of constructions are derived in a similar way, the identical constraint is explained.³

2.3 Argument: the Exhaustive Linking of the RC

Another shared property between SACs and CHCs is the exhaustive linking of the RC. In a CHC, the RP together with the RC must be semantically related to all the conjuncts of the coordinate DP complex that hosts the antecedents. Consider the following forms (see Moltmann 1992: 176):

- (10) a. *a child, a man and a woman who are married
 b. *a man, a woman, and a child who are married

In (10a), there are three conjuncts. Note that no conjunction occurs between the first two conjuncts, and thus the three conjuncts are of the same coordinate complex. If there is a conjunction between *a child* and *a man*, the example may be analyzed as two coordinate complexes: [*a child and a man*] and [*a woman who are married*], which is acceptable.

³ Pronoun complexes in Norwegian can be modified by PPs or RCs that contain collective predicates (Hestvik 1992: 569), as shown in (i). The syntactic and semantic properties of such data are not clear to us.

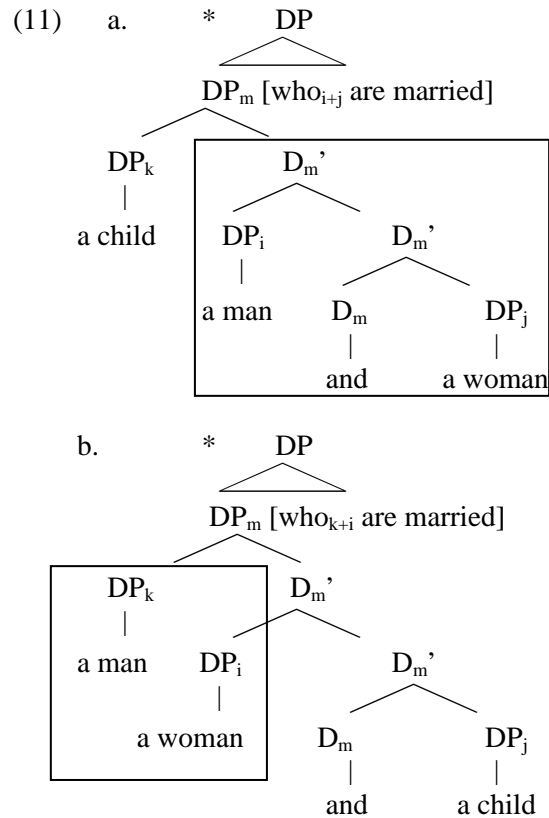
- (i) a. [Han og hun I den omfavnelsen der] er de søteste. (Johanessen 1998: 185)
 he and she in that embracing there are the sweetest
 'The male and the female (engaged) in that embracing over there are the sweetest ones.'
 b. Jog så [han og hun som hadde sittet sammen på den benken I natt]
 I saw he and her who had sat together on that bench in night
 'I saw the male and the female who had sat together on that bench last night.'

Proper names and pronouns can also be modified by RCs in Chinese, a language that has no articles. However, the RCs in such constructions are non-restrictive RCs (Lin 2003).

- (ii) a. Jie-le-hun de {ta he wo / Amao he Lili} hen shao zai mai meiguihua.
 married MOD he and I / Amao and Lili very seldom again buy rose
 'Since {he and I / Amao and Lili} got married, {we/they} have seldom bought roses again.'
 b. Bu yuan fa-pang de ni yinggai duo yundong.
 not want get-fat MOD you should more exercise
 'You, who do not want to get fat, should do more exercise.'

We do not consider this latter construction. The same clarification applies to (10b).

Following Zhang (2004), we assume that multiple non-final conjuncts are multiple Specs of the conjunction. If so, after the merger of the outer Spec, no operation can target the structure that excludes one of the Specs. Thus the RC in (10a) cannot target *a man and a woman*, excluding *a child*, as illustrated in (11a). Moreover, no operation may target two specs excluding the complement. Thus the RC in (10b) cannot target *a man* and *a woman*, excluding *a child*, as illustrated in (11b). Instead, all three conjuncts must be targeted exhaustively:



- (12) *John met a woman, Mary met a man and a child remained alone who have known each other for a long time.

The linking of the RC in the unacceptable SAC in (12) is not exhaustive, either. The unacceptability is accounted for if its derivation is similar to that of (10b). Specifically, if *a woman*, *a man*, and *a child* form a coordinate DP in a certain step of the derivation, the first two are multiple Specs and the last is the complement in the coordinate DP. The two Specs do not form a constituent, thus it is impossible for the RC to target the two Specs and exclude the complement.

2.4 Argument: the Identical D-features of the Associated Nominals

One more shared property of CHCs and SACs is that the determiners of the Head nominals must be identical. Vergnaud (1974) and Link (1984) note that the determiners of the Head nominals must be identical in CHCs, and Moltmann (1992: 191, 195) further notes that the property is shared by SACs:

- (13) a. *a man and the woman who met last year (CHC)
 b. *the father of John and a woman who know each other well (CHC)
 c. *A man entered and the woman left who met last year. (SAC)
 d. *John saw the man and Mary saw a woman who met last year. (SAC)
- (14) a. *every man and {the/a} woman who met yesterday in this room (CHC)
 b. *Every man came and {the/a} woman left who danced together (SAC)
- (15) a. *all men and most women who danced together (CHC)
 b. *every man and almost every woman who danced together (CHC)
 c. *John saw all men and Mary saw most woman who danced together. (SAC)
 d. *John greeted every man and Mary greeted almost every woman who danced together. (SAC)

In (13a), for instance, *a man and the woman* is the Head of the RC *who met last year*. Since the determiner *a* and the determiner *the* are not identical, the CHC is not acceptable. Parallel to this, in (13c), the two antecedents are *a man* and *the woman*, respectively. The difference in the determiners of the two antecedents also causes the unacceptability of the SAC. Other data above show the same fact.

Importantly, as pointed out by Moltmann, the condition controlling the determiners of the Head nominals does not hold for simple conjoined nominals, as seen in the following examples:

- (16) a. John met a man and the woman he saw yesterday.
b. John met that man and a woman.

In (16a), the coordinate object is composed of two conjuncts: *a man*, and *the woman he saw yesterday*. The former is indefinite and the latter is definite. The two conjuncts in (16b) are also different in their determiners.

The condition on the determiners of the Head nominals of both CHCs and SACs can be accounted for by our hypothesis that, as in CHCs, the real Heads of the RCs in SACs are coordinate complexes. Semantically, RCs are predicates of their Head nominals, and each predicate has only one subject. For the RC of a CHC and SAC, its Head nominal must be a unique nominal, and this unique nominal cannot have different specificity or quantificational features. In our analysis, the unique nominal is a coordinate DP complex. Thus, in fact, the RCs of CHCs and SACs do not have multiple Heads. Instead, each instance of the two constructions has a single coordinate complex Head. In an SAC, the conjuncts of this single complex Head respectively undergo certain syntactic operations later. The operations cause the conjuncts to split into two clauses (see Section 3). The very same constraint on the determiners of CHCs and SACs indicates that the two constructions may undergo certain identical steps in their derivation. In our analysis, one of the identical steps is that both constructions have a single coordinate complex as the antecedent of the RP, as the structure in (5) shows.

Moltmann (1992: 191) denies any semantic approach to this condition restricting the determiners of the Head nominals. She argues

that (17a) could be perfectly interpretable and (almost) equivalent to (17b), and similarly (18a) could be perfectly interpretable and (almost) equivalent to (18b):

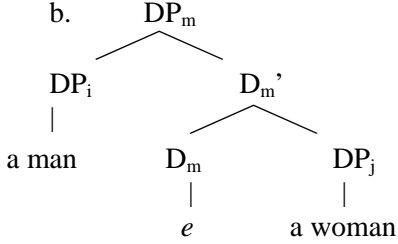
- (17) a. *a man and the woman who met last year
- b. a man_i and the woman that he_i met last year
- (18) a. *A man entered and the woman left who met last year.
- b. A man_i entered and the woman left who met him_i last year

Indeed, D-feature unification is a formal constraint. A crucial difference between the a- and the b-sentences above is that the RC in the latter is the predicate of the simplex nominal, *the woman*. If the RC requires its Head, *the woman*, to have a consistent set of specificity features, so should all other RCs. Accordingly, the a-sentences are unacceptable because *a man* and *the woman* do not form a consistent set of specificity features for the RC, which takes the combination of the two nominals as its Head. If the Head of an RC does not exhibit consistent specificity features, there cannot be any predication relation between the Head and the RC.

The D-feature unification of the antecedents of CHCs and SACs supports our claim that there is no multiply-Headed RC. Instead, the so-called multiply-Headed RCs are RCs that take a single coordinate complex Head.

All of these similarities between CHCs and SACs suggest that the two constructions may be derived in a similar way. If so, the so-called multiple Heads are in fact a single coordinate DP complex.

In this section, we have argued that both CHCs and SACs take a single coordinate DP complex as Head, and thus they are not syntactically multiply-Headed. We thus claim that the antecedent of the RP in an SAC is a coordinate complex, and the head of this complex is realized by a null conjunction (the element *e* in (19), see Footnote 5). Thus regardless of the derivations of the relative clause, at certain point of the derivation, (19b) is the structure to derive (19a):

- (19) a. Mary met a man_i and John met a woman_j [who_{i&j} knew each other_{i&j} well]
- b. 

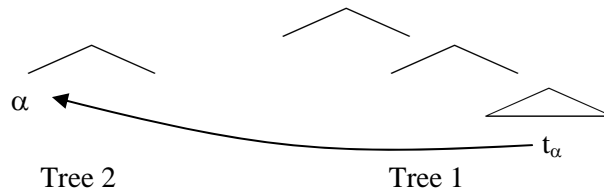
3. DERIVING SACS BY THE EVACUATION OF COORDINATE DP COMPLEXES

We have argued for the existence of a coordinate DP in SACs (DP_m in (19b)). We now propose that SACs are derived by the sideward movement of the conjuncts of this DP.

3.1 Sideward Movement

Before I spell out my proposed derivations of SACs, I will briefly introduce this mode of movement. Generally speaking, the movement of α lands at a position that c-commands the launching site, in the same “tree.” The movement from one tree into another tree is a sideward movement. The mode of sideward movement is illustrated as follows.

- (20) Step 1: α moves from Tree 1 to Tree 2



Step 2: Tree 1 is integrated into Tree 2 by a kind of “remnant merger”⁴

Since the landing site of a sideward movement is in a different tree from that of the launching site, it neither c-commands nor is c-commanded by the launching site. Moreover, since the element that undergoes sideward movement may be reselected by a verb in the new working site, it may land at a theta position.

Sideward movement is discussed in Bobaljik & Brown (1997), Nunes (2001), Hornstein (2001), and Nunes & Uriagereka (2000). The existence of sideward movement is expected, if Remerge (Move), like Merge, simply sets up new syntactic relations. As pointed out by Hornstein & Nunes (2002: 27), sideward movement does not add any new constraint to our current computational system. In contrast, it removes the stipulation that movement must target the syntactic object that contains the trace. Hornstein & Nunes (2002) claim that such a stipulation is a residue of the use of D-structure in an analysis, which is not compatible with the Minimalist Program. If no D-structure is assumed and the computational system relies on generalized transformations to build phrasal objects, the landing site of the operation of a movement may be beyond the domain that contains the trace. “In other words, in a system that may operate with more than one single-rooted syntactic object at once, as in Chomsky 1995, only brute force would force movement to always target the same tree.” (Hornstein & Nunes 2002: 28) Sideward movement has been argued to account for a number of unrelated phenomena, such as adjunct control, *tough*-movement, and other null-operator constructions (Hornstein 2001), issues pertaining to extraction domains (Nunes & Uriagereka 2000), PRO-gate effects (Hornstein and Kiguchi 2003), donkey anaphora (Boeckx 2003), antecedent-resumptive relations (Kayne 2002), and head movement (Bobaljik & Brown 1997).

⁴ The “remnant merger” is parallel to remnant movement (den Besten & Webelhuth 1990, Müller 1998), in which part of a phrase is extracted, and then the rest of the phrase is moved.

3.2 Deriving an SAC by the Sideward Movement of Conjuncts

I propose the following derivations for an SAC: the two antecedents of an SAC are originally two conjuncts of a coordinate nominal. Then each has undergone a sideward movement, landed in a new working site, and been selected by a verb. After that, a coordinate clausal complex is also constructed. In the old working site, a complex nominal is constructed, in which the relative clause takes the remnant coordinate nominal as its antecedent. Finally, the complex nominal adjoins to the coordinate clausal complex. The whole process includes four major steps. I illustrate the derivation of (21) as follows.

- (21) Mary met a man_i and John met a woman_j [who_{i&j} knew each other_{i&j} well]

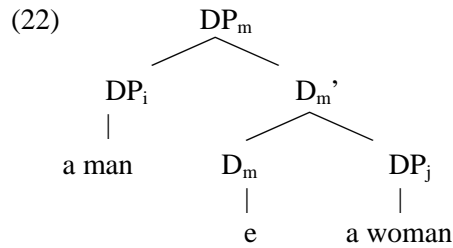
Step I: *a man* and *a woman* form a coordinate nominal, with a null conjunction *e*.⁵

⁵ One reviewer asked why the assumed conjunction here must be null. If it were not null, unacceptable forms like the following would be derived:

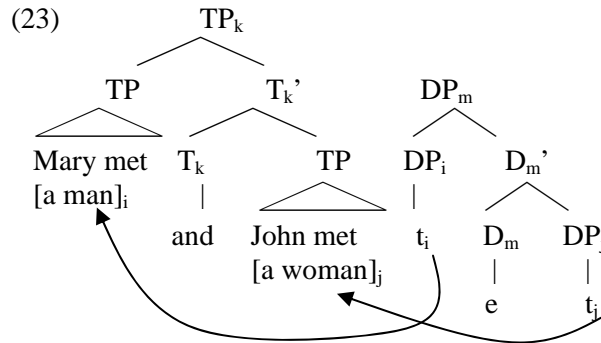
- (i) *Mary met a man and John met a woman and who knew each other well.
My answer to the question is that in some coordinate constructions in Chinese, overt coordinators are not allowed. One example is gapping constructions:

- (ii) a. Baoyu chi-le san ge pingguo, keshi Daiyu zhi chi-le liang ge.
Baoyu eat-PRF three CL apple but Daiyu only eat-PRF two CL
'Baoyu ate three apples but Daiyu ate only two.'
b. Baoyu chi-le san ge pingguo (*keshi) Daiyu ~~chi-le~~ si ge juzi.
Baoyu eat-PRF three CL apple but Daiyu eat-PRF four CL orange
'Baoyu ate three apples and Daiyu ate four oranges.'

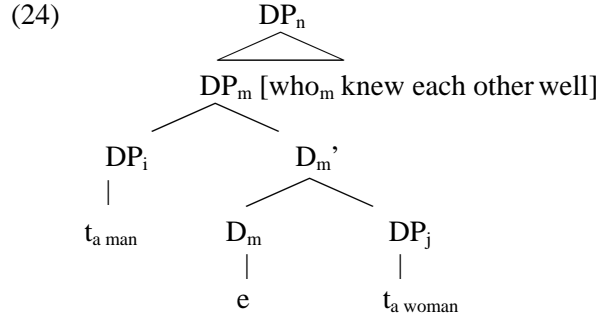
If overt coordinators are not required in all coordinate constructions, or even not allowed in certain types of coordinate constructions in Chinese, the absence of coordinators in the assumed coordinate DPs in SACs does not challenge the analysis presented here.



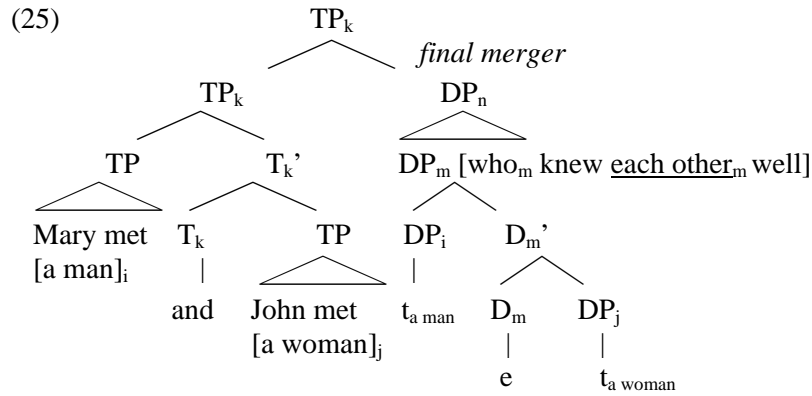
Step II: the DP *a man* undergoes sideward movement and is selected by *met*. After certain additional syntactic operations, the TP *Mary met a man* is constructed. Similarly, the DP *a woman* undergoes sideward movement and is selected by *met*. After certain further additional syntactic operations, another TP *John met a man* is constructed. The two TPs and the conjunction *and* form a coordinate clausal complex TP_k (recall that in 2.1 we mentioned that the coordinator *and* itself does not have any categorial features, and it obtains categorial features from conjuncts, which is why it is under T in (23)).



Step III: In the old working site, a complex nominal DP_n is constructed, which contains the relative clause and its antecedent, the remnant DP_m:



Step IV: DP_n , which has been constructed in Step III, adjoins to TP_k , which has been constructed in Step II:



This proposed derivation of the SAC in (21) has the following characteristics:

<i> Both DP_i and DP_j are conjuncts and they move out of the coordinate complex DP_m ;

<ii> DP_i and DP_j are reselected by the verbs. Two instances of sideward movement;

<iii> DP_n , which hosts the RC and the remnant of the DP_m after the conjunct movement, adjoins to TP_k , as the last step of the derivation.

Consider <i>. In this proposed derivation of SACs, DP_i and DP_j are conjuncts and they move. This derivation does not violate the Coordinate Structure Constraint (CSC), which states that no single conjunct may

move (Ross 1967). CSC can be viewed as a parallelism requirement, which bans asymmetrical syntactic dependencies between conjuncts. Across-The-Board constructions such as (26) exhibit parallel syntactic dependencies between conjuncts and are thus compatible with CSC:

- (26) [Which nurse]_i did Fred date _i and Bob marry _i?

Like Across-The-Board constructions, SACs also manifest parallel syntactic dependencies in conjuncts, and thus are also compatible with CSC.

The characteristic <ii> can be described as follows. DP_i and DP_j are reselected by the two transitive verbs, respectively. One might wonder whether the proposed derivation violates the Complex NP Constraint (Ross 1967), since the two conjuncts are extracted from a complex nominal. Theoretically, sideward movement permits extraction from islands if the islands are not yet integrated into the core structure (see Nunes & Uriagereka 2000, Hornstein 2001, Nunes 2004, Taylor 2006). In our derivation, the sideward movement occurs in Step II, and the complex nominal is constructed in Step III. The former step precedes the latter step. Thus the sideward movement occurs before any complex nominal exists, and so it does not violate the Complex NP Constraint.

Similarly, when the sideward movement occurs in Step II, DP_n, which becomes an adjunct in Step IV, does not exist yet. The sideward movement does not violate any adjunct island constraint.

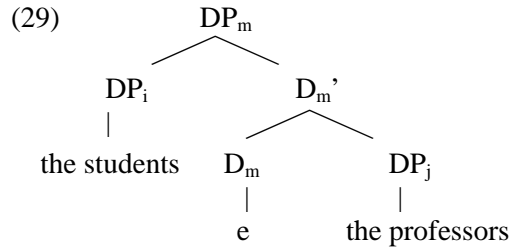
We now move to <iii>: DP_n adjoins to TP_k, as the final step of the derivation. DP_n is a complex nominal, containing an RC. Theoretically, there is no constraint on the category of an adjunct. If there is no illegal integration of the formal features, syntactic merger can be free. The semantic relation between DP_n and TP_k is represented by the sideward movement chains.

We conclude this subsection with a description of one more shared property of SACs and CHCs, so as to support our unified analysis. Recall that the determiners of the Head nominals must be identical in both CHCs and SACs (2.4). Link (1984) observes that partitive nominals allow for RCs with apparent multiple Heads, regardless of the differences in the nature of the determiners of the conjunct nominals, as in (27a). Such data are in contrast to non-partitive data like (27b).

Moltmann (1992: 202) notes that this contrast in CHCs is also seen in SACs, as shown in (28):

- (27) a. all of the students and several of the professors who have met in secret
 b. *all students and several professors who have met in secret
- (28) a. John saw all of the students and Mary met most of the professors who have met in secret.
 b. *John saw all men and Mary met most woman who danced together.

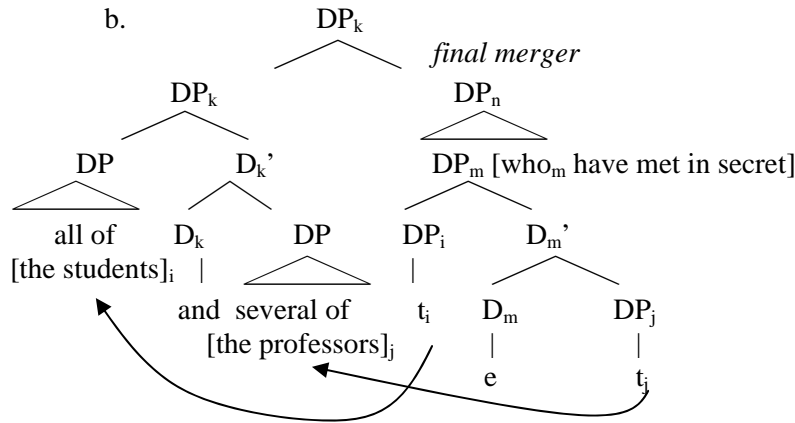
With respect to (27a) and (28a), Moltmann (1992: 202) explains “the reason why the agreement condition on the determiner is met in this case, most plausibly, is that *the students* and *the professors* share definite determiners. If this is true, then apparently the relative clause relates to the lower NPs, rather than to the conjunct partitive NPs.” We adopt her account. In our analysis, accordingly, both (27a) and (28a) have the following DP as the Head of the RC *who_m have met in secret*:



The derivation of (27a) is illustrated in (30). DP_i *the students* undergoes sideward movement to be remerged with *of*, and then *of the students* merges with *all*. Thus a new nominal *all of the students* is built. Similarly, DP_j *the professor* undergoes sideward movement to be remerged with *of*, and then *of the professors* is merged with *several*. Thus a new nominal *several of the professors* is built. After that, the two newly-built complex nominals merge with the conjunction *and*, one after the other, forming the coordinate DP complex *all of the students and several of the professors*. In the old working site, the remnant DP_m

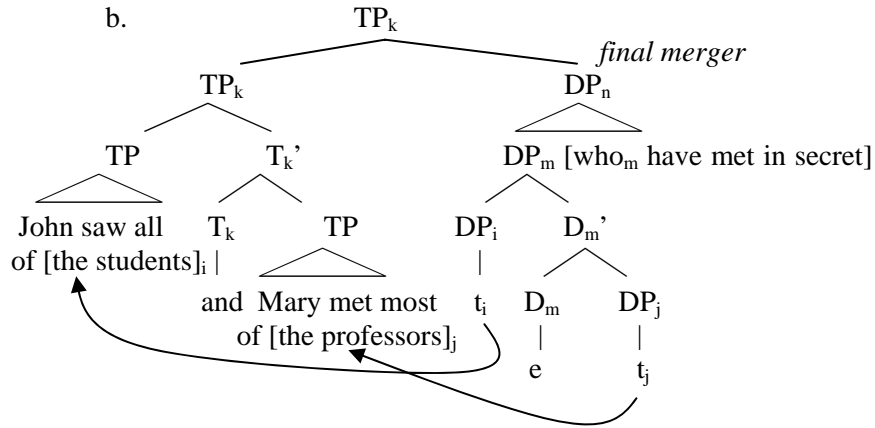
becomes the Head of the RC, forming DP_n . Finally, DP_n adjoins to the coordinate complex.

- (30) a. all of the students and several of the professors who have met in secret



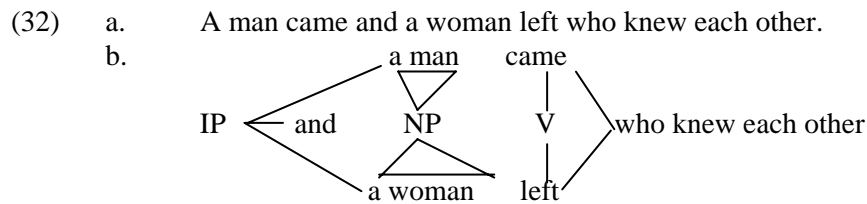
The derivation of (28a) is illustrated in (31). DP_i *the students* undergoes sideward movement to be re-merged with *of*, and then *of the students* merges with *all*. Thus a new nominal *all of the students* is built. Similarly, DP_j *the professor* undergoes sideward movement to be re-merged with *of*, and then *of the professors* merges with *most*. Thus a new nominal *most of the professors* is built. After that, the two newly-built complex nominals are selected by the transitive verbs *saw* and *met*, respectively. Other operations occur to build the two clauses separately: *John saw all of the students* and *Mary met most of the professors*. Then, a process occurs by which these two clauses merge with the conjunction *and*, one after the other, and form the clausal coordinate complex *John saw all of the students and Mary met most of the professors*. In the old working site, the remnant DP_m becomes the Head of the RC, forming DP_n . Finally, DP_n adjoins to the coordinate clausal complex.

- (31) a. John saw all of the students and Mary met most of the professors who have met in secret.



4. A COMPARISON TO THE THREE-DIMENSIONAL ANALYSIS

We now compare our analysis with Moltmann's (1992) three-dimensional analysis (3DA) of SACs. Moltmann (1992: 147) claims that in the example *A man came and a woman left who knew each other well*, "*a man* and *a woman* are implicitly coordinated." The notion of implicit coordination means that two elements function like a coordinate complex, although they do not form a coordinate complex syntactically. This is very different from my proposal as to the derivations of SACs, where elements are conjoined by a null conjunction at a certain step. Moltmann's syntactic representation of (32a) is (32b):



In (32b), the two clauses are conjoined, but not the two NPs. Similarly, the structure of (33a) (= 1a/21a) is illustrated by Wilder (1999) as (33b):

- (33) a. John met a man and Mary met a woman who knew each other well.
 b.

One major difference between our approach and that of 3DA is that the apparent antecedents do not move in 3DA. Instead, they are linked to the RC by certain special tree-branches.

One disadvantage of this example of 3DA is that the two overt antecedents of RP, *a man* and *a woman* in (33), never form a constituent in the derivation, and additional constraints are required to cover the facts presented in Section 2. For instance, if the two objects are selected by two verbs respectively, they need not have the same D-features. Then the D-feature unification in (2.4) needs to be accounted for. Similarly, additional constraints are required to cover the exhaustive linking effect (2.3), since nothing rules out a derivation such as the following:

- (34)

Moltmann (1992) indeed takes efforts to stipulate certain constraints to restrict the derivations. In our approach, the two properties are automatically captured: the two nominals form a coordinate complex before they are distributed into the two clauses and the coordinate complex is the real and unique antecedent of the RP, which does not tolerate the internal disagreement of D-features and partial binding with the RP.

Another disadvantage of 3DA is that it introduces an additional tool to syntactic theory. Linearization from a three-dimensional structure to a one-dimensional order must be more complicated than that from a two-dimensional representation. Although advocates of 3DA have sought to formalize the possible linearization, if what they want to cover empirically can be covered by the simpler two-dimensional approach, we see no advantage in adopting the tool.⁶

5. REQUIREMENT FOR PARALLELISM IN PAIRED DEPENDENCIES OF COORDINATE CONSTRUCTIONS

In this section, I show that the parallelism seen in SACs is a general constraint, which may also be observed in other types of paired dependencies of coordinate constructions.

The two chains of the sideward movement of an SAC exhibit the requirement for parallelism. First, the two chains, which start from

⁶ Kayne (2000, see Vassilieva & Larson 2001: 463) proposes that the plural pronoun *they* in data like *John_i told Mary_j they_{i&j} should leave* bears only a single index, equivalent to a singular pronoun, and it is possible that *they* is essentially [*he/she/it* + Δ] (Δ means some other individual(s)). One might wonder whether the RPs, rather than their antecedents, are hidden coordinate complexes in SACs. This is unlikely, for two reasons. First, unlike the pronoun *they*, RPs are not intrinsically plural. Thus RPs cannot have a consistent [*x* + *y*] structure. Second, RPs in restrictive RC constructions have been argued to be bound pronouns (Demirdache 1991). If the compositional analysis of pronouns does not apply to bound pronouns such as *themselves* (compare: *Mary_i thinks that they_{i&j} will win the dancing contest.* and **Mary_i expects themselves_{i&j} to win the dance contest.*), it should not apply to RPs, either. We conclude that the syntax of SACs is different from the syntax of plural pronouns that take split antecedents, and that the RPs in SACs are not hidden coordinate complexes. Instead, the real antecedents of the RPs of SACs are hidden coordinate complexes.

conjuncts, must end in conjuncts. An example like (35), in which the two antecedents of the RC are not hosted in any conjuncts, is not acceptable.

- (35) *After Mary met [a man]_i, John met [a woman]_j who_{i&j} knew each other well.

Second, the landing sites of the two DPs in SACs must be in similar syntactic positions. In other words, the two DPs must have similar thematic features. For instance, they must both be either subjects or objects, as in (36a) and (36b), respectively. The examples in (36c) through (36f), where one moved DP is an object and the other moved DP is a subject in the landing clauses, are not acceptable (more examples can be found in Moltmann 1992: 175 (58)):

- (36) a. [A man]_i came and [a woman]_j left [who_{i&j} knew each other well].
b. John met [a man]_i and Mary met [a woman]_j [who_{i&j} knew each other well].
c. *[A man]_i met Mary and John met [a woman]_j [who_{i&j} knew each other well].
b. *John saw a man_i and a woman_j saw Mary who_{i&j} were wanted by the police.
c. *A woman came and John met a man who knew each other well. (Moltmann 1992: 174 (51a))
d. *Mary met a man and John said a woman arrived who know each other quite well.
(Moltmann 1992: 174 (53b))

The following SAC, however, is acceptable. The theta-role of the DP *a man* is the theme and the theta role of the DP *a woman* is the goal. The two theta roles are similar, though not identical. According to Reinhart (2001), all of the features of agent and theme (patient) are contrastive, whereas the features of other pairs are not. Thus although *a man* and *a woman* in (37) do not have identical thematic features, they do have similar thematic features (moreover, both can be complements of verbs), and the requirement for parallelism is not drastically violated here.

- (37) John saw a man and Mary talked to a woman who were wanted by the police.

Similar requirements for parallelism are observed in the so-called Interwoven Dependency Construction, such as (38a) (see Zhang, to appear, for a sideward movement analysis of the constructions). First, the paired chains of the movement of an IDC must end in conjuncts. Examples as in (38b), in which the two *wh*-phrases are not conjuncts, are not acceptable. The counterparts of such examples are not acceptable even in multiple *wh*- movement languages (e.g., certain Slavic languages) (Citko 2003).

- (38) a. [[Which nurse]_i and [which hostess]_j]_k did Fred date *t_i* and Bob marry *t_j*, respectively?
b. *[[Which nurse]_i [which hostess]_j]_k did Fred date *t_i* and Bob marry *t_j*, respectively?

Second, the launching sites of the two DPs in IDCs must be of similar syntactic positions, which means that the two DPs must have similar thematic features. For instance, they must be either both subjects or both objects, as in (39a) and (39b), respectively. The example in (39c), where one DP is moved from an object position and the other is moved from a subject position, is not acceptable. In (39d), the two nominal conjuncts are not of the same semantic type.

- (39) a. [[Which nurse]_i and [which hostess]_j]_k *t_i* dated Fred and *t_j* married Bob respectively?
b. [[Which nurse]_i and [which hostess]_j]_k did Fred date *t_i* and Bob marry *t_j*, respectively?
c. *[[Which nurse]_i and [which hostess]_j]_k did Fred date *t_i* and *t_j* marry Bob, respectively?
d. *[[How many girls]_i and [how many breads]_j]_k did Fred kiss *t_i* and Bob bake *t_j* that evening, respectively?

Both SACs and Interwoven Dependency Constructions are coordinate constructions containing paired chains of movement. The facts in (35) through (39) tell us that the elements that undergo the paired

movement must have parallel syntactic relations to other elements in the construction. In fact, not only paired chains of movement, but also paired binding dependencies of coordinate complexes exhibit the need to conform to the parallelism requirement. In the following, we report the fact that the structural hierarchy of two elements of one conjunct is preserved in their binding links in another conjunct. This is also an effect of the parallelism requirement, or resemblance relation, a type of coherence relation between conjuncts.

Co-reference between the multiple names in one conjunct and the pronouns in another conjunct follows a crossing pattern, rather than a nested pattern (Sheldon 1974, see Speas 1990: 232 for other references). The crossing pattern is exhibited in the acceptable co-indexing in (40), and the nested pattern is exhibited in the unacceptable co-indexing in (40).

- (40) a. John_i hit Bill_j and then he_{i/*j} kicked him_{j/*i}.
b. John_i hit Bill_j and then Sara kicked him_{j/*i}.

In the crossing pattern, the hierarchy of the structure of the two links of the two binding chains in one conjunct is preserved in the other conjunct.

The parallelism requirement of the various coordinate constructions introduced above can be covered by Lang's (1984: 22) following condition:⁷

- (41) Given some coordinate construction divided by a connector into two sub-structures s1, s2, then for the specification of a pair cj1, cj2 within s1 and s2 respectively as conjuncts, it holds that
(a) as to their format, cj1, cj2 are delimited by the set of parallel-structured matching constituents in s1, s2
(b) cj1 and cj2 must display parallel stress patterns
(c) cj1 and cj2 must be contrastable constituentwise

⁷ Zoerner (1995: 61) proposes a similar condition, Condition on Index Association (CIA): In a series of parallel index sequences, the *n*th term of one sequence associates syntactically and semantically only with the *n*th of any other sequence.

Item (41a) captures the acceptability patterns of (36), (39), and (40). This is an effect of the parallelism requirement. Moreover, from PF and information structure perspectives, (41b) and (41c) are true as well.⁸ One possible account for the parallelism requirement in (41a) is processing economy (cf. Frazier et al. 2001). I leave this for future research.

6. SUMMARY

In this paper, I have proposed a syntactic derivation for Split Antecedent Relative Clause Constructions such as *Mary met a man and John met a woman who knew each other well*. I have claimed that the two antecedents of such a construction are originally two conjuncts of a coordinate nominal. Then each has undergone a sideward movement, involving a move from the original working site to a new one, and being selected by a verb. The two nominals take part in the construction of a coordinate clausal complex. In the old working site, a complex nominal is constructed, in which the relative clause takes the remnant coordinate nominal as its antecedent. Finally, the complex nominal adjoins to the coordinate clausal complex. This analysis shows how the freedom in the selection of the landing site gained from sideward movement makes the syntactic derivations of this special type of relative clause construction possible, while at the same time avoiding the problems of the alternative three-dimensional analysis.

This analysis also shows that Split Antecedent Relative Clause Constructions do not pose problems to either conventional Matching-Adjunction Analysis or the Raising-Complement Analysis of relative clause constructions (Kayne 1994, Bianchi 1999, among others). In the Matching Adjunction Analysis, our proposed sideward movement may occur before the adjunction of the relative clause to the Head nominal. In

⁸ One reviewer points out that (i) is not acceptable, although it satisfies the parallelism requirement.

(i) *the boy_m met his uncle_i and the girl_n met her aunt_j who_{m&n} knew each other well
It is possible that the RC *knew each other well* is the focus of the whole sentence in (i), and the two objects *his uncle* and *her aunt* are also foci in their containing clauses. Since it is easier for focus elements to associate each other, it is easier for the RC to associate with the objects, rather than the subjects.

the Raising-Complement Analysis, the relative pronoun and the antecedent DP are merged together initially. The antecedent DP moves away from the RP later (Bianchi 1999, 2000, Zwart 2000). In this analysis, our proposed sideward movement may occur before the antecedent DP is merged with the relative pronoun. Thus our proposed derivations are compatible with either analysis. Therefore, the existence of SACs neither calls for any three-dimensional structure in our syntactic theory, nor is it in conflict with either the traditional Matching-Adjunction Analysis or the Raising-Complement Analysis of relative clause constructions.

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關係子句的一對多修飾關係

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一個關係子句可以修飾兩個不相鄰名詞的組合，如 *Mary met a man and John met a woman who knew each other well* 中的關係子句 *who knew each other well* 修飾 *a man* 與 *a woman* 的組合體。本文提出這種句式中的兩個先行詞本來是兩個並列項，它們所構成的並列成分才是關係子句的真正被修飾成分。兩個先行詞不相鄰的原因是它們分別都經歷了橫向位移。這項研究顯示了橫向位移的解釋力。

關鍵詞：分裂先行詞，關係子句，橫向位移，並列關係