

## Recent Developments in the Role and Reference Grammar Theory of Clause Linkage<sup>\*</sup>

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Role and Reference Grammar (RRG) contains a theory of the syntax and semantics of clause linkage. This theory was first developed in Foley & Van Valin (1984) but remained relatively unrevised through the end of the 1990s. In the last five years there has been a flurry of new work on clause linkage, including a substantial revision and expansion of the theory in Van Valin (2005). This paper summarizes the major changes to the RRG theory of clause linkage.

Key words: RRG, clause linkage, major theoretical changes

### 1. Introduction

Ohuri (2001) pointed out that the theory of clause linkage in RRG remained basically unchanged between Foley & Van Valin (1984) and Van Valin & LaPolla (1997) (VVLP). This is because there is little theoretical discussion of these issues in the literature. However, there has been new work on clause linkage in RRG, e.g. Ohori (2001), Kwee (2002), Bickel (2003), Kockelman (2003), Good (2003), Guerrero (2004), and this has prompted a new look at this part of the theory. Van Valin (2005) presents the updated theory of clause linkage in detail, and in this paper I shall summarize some of the more significant changes.

### 2. Sentential juncture

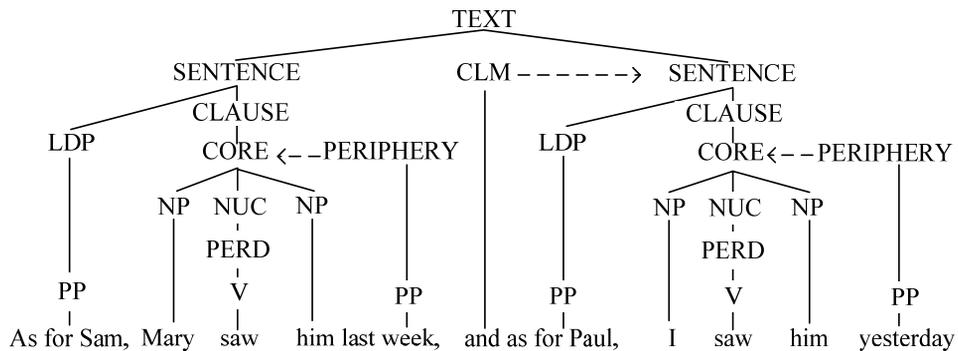
In VVLP:469, the notion of sentential juncture was introduced; the examples given to illustrate are shown in (1).

- (1) a. As for Sam, Mary saw him last week, and as for Paul, I saw him yesterday.  
b. Fu vua kuae-ga siare ije, fu naebe ume. Barai (Olson 1981)  
3SG talk say-SP/DT betelnut DEF 3SG NEG chew  
'He was talking, and as for betelnut, he did not chew it.'

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In the English example there are two complete sentences, each with its own left-detached PP. The Barai one is particularly interesting, as the linking morpheme *-ga* signals that the privileged syntactic arguments of the two sentences are the same but that there is a change of topic in the second sentence; the new topic appears in the left-detached position of the second sentence. This linkage will be termed ‘sentential juncture’, and the English example in (1a) will be represented as in Figure 1, with ‘text’ as the highest node dominating the two sentence nodes.

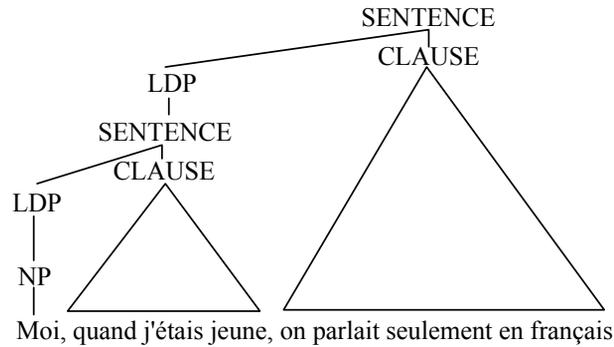


**Figure 1:** Sentential coordination in English

The examples in (1) both involve coordination; cosubordination is impossible at the sentence level, because there are no sentential operators that could be shared. Sentential subordination is possible, and one type involves sentences or clauses occurring in the right- or left-detached positions. An example of a sentence in the left-detached position can be found in spoken Acadian French (Pavey 2001).

- (2) *Moi, quand j'étais jeune, on parlait seulement en français.*  
 I when I was young one spoke only in French  
 ‘Me, when I was young, we only spoke in French.’

In this example, *Moi, quand j'étais jeune* ‘me, when I was young’ is a preposed adverbial clause with its own left-detached expression, which makes it a sentence, and this sentence is then in the left-detached position of the matrix sentence. A simplified representation of its structure is given in Figure 2.



**Figure 2:** Simplified structure of sentential subordination in (2)

This is sentential subordination, because there is a sentence in the left-detached position, making it a daughter of the higher sentence node. A more common example of sentential subordination involves the fronting of adverbial clauses, as in (3).

(3) After she arrived at the party, Kim saw Pat.

Adjunct PPs may be linked to the left-detached position, where they are set off by an intonation break, e.g. *After the concert, Kim saw Pat*, and the same holds for fronted adverbial clauses, as (3) shows. Another candidate for sentential subordination is direct discourse complements; the linked clause has independent illocutionary force, hence is a full sentence.

Not all instances of fronted adverbial clauses involve the left-detached position. German, which is a verb-second language, shows a clear contrast between fronted clauses which are in the left-detached position and those which are in the precore slot: a clause in the precore slot triggers inversion of the privileged syntactic argument and the finite verb or auxiliary, while one in the left-detached position does not. This is illustrated in (4), from Bickel (1993).

- (4) a. Wenn es regn-et, geh-e ich nicht raus. PRCS  
 if 3NEUSG rain-3SGNPAST, go-1SGNPAST 1SGNOM not out  
 'If it rains, I don't go out.'
- b. Wenn er weiter so red-et, ich hör-e nicht zu. LDP  
 if 3MSG further so talk-3SGNPAST, 1SGNOM listen-1SGNPAST not PREV  
 'If he continues speaking like that, I just don't listen.'

In (4) the finite verb and privileged syntactic argument are inverted, signaling that the

initial conditional clause is in the precore slot. In (4b), on the other hand, there is no inversion, which means that the initial clause is outside of the clause and therefore in the left-detached position. English also has clear instances of a fronted clause in the precore slot, as illustrated in (5).

- (5) Bill was very angry, because after Mary arrived at the party she slapped him.

The fronted adjunct subordinate clause *after Mary arrived at the party* cannot be in the left-detached position, because it is inside a subordinate clause, and subordinate clauses cannot in principle have a left-detached position, which is outside of the clause. A subordinate clause can, however, have a precore slot, since it is a clause-internal position, and therefore the proposed adverbial clause in (5) must be in the precore slot. This is an example of clausal subordination, since the embedded clause is in the precore slot, which is a daughter of the clause node.

### 3. Types of subordination: adjunct modifiers

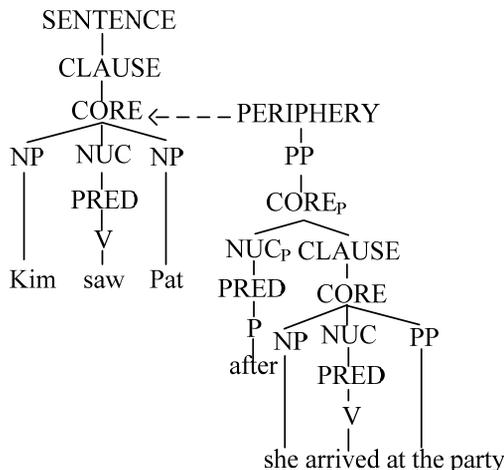
When subordinate junct function as adjunct modifiers, they occur in a periphery. One of the innovations in Van Valin (2005) is the recognition that there is a periphery modifying every level of the clause. Most adjunct PPs occur in the periphery<sub>CORE</sub>; an example with its logical structure is given in (6).

- (6) a. [CLAUSE [CORE Kim saw Pat] ← [PERIPHERY after the concert]].  
b. **be-after'** (concert, [see' (Kim, Pat)])

Some prepositions can also take clausal objects, and this results in an adjunct adverbial clause, which, like the adjunct PP in (6), occurs in the periphery<sub>CORE</sub>. This is illustrated in (7).

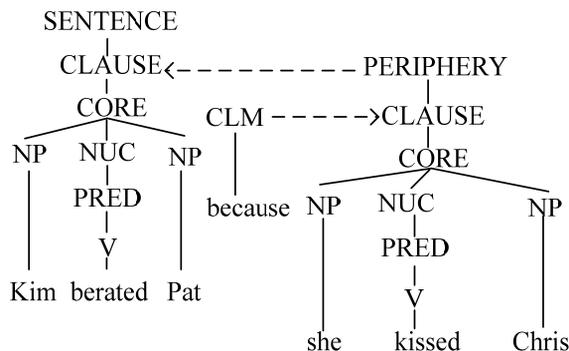
- (7) a. Kim saw Pat after she arrived at the party.  
b. **be-after'** ([BECOME **be-at'** (the party, 3SGF)], [see' (Kim, Pat)])

The relationship of the adverbial subordinate clause to the core it modifies is the same as that of a peripheral PP modifying a core; thus in *Kim saw Pat after the concert*, the relationship of the PP *after the concert* to the core *Kim saw Pat* is the same as that of the subordinate clause *after she arrived at the party* to the core it modifies. This will be referred to as 'ad-core subordination', because the subordinate clause is a modifier of the matrix core and occurs in the periphery<sub>CORE</sub>. The structure of (7) is given in Figure 3.



**Figure 3:** Ad-core subordination in English

Not all adjunct clauses are objects of predicative adpositions, and those that are not, e.g. adverbial clauses marked by *because*, *if*, or *although* in English, are not in the periphery<sub>CORE</sub>. Bickel (1993, 2003) shows that these constructions have quite different properties from ad-core subordinate clauses, and labels them ‘ad-sentential subordination’; a more appropriate name in RRG terms would be ‘ad-clausal subordination’. Such a clause does not occur in the periphery<sub>CORE</sub> but rather in the periphery<sub>CLAUSE</sub>. Unlike ad-core subordinate clauses, they do not express the spatial or temporal setting of the event expressed by the core; they express, e.g. the reason or a condition for the event expressed by the clause as a whole. The structure of *Kim berated Pat because she kissed Chris* is given in Figure 4.

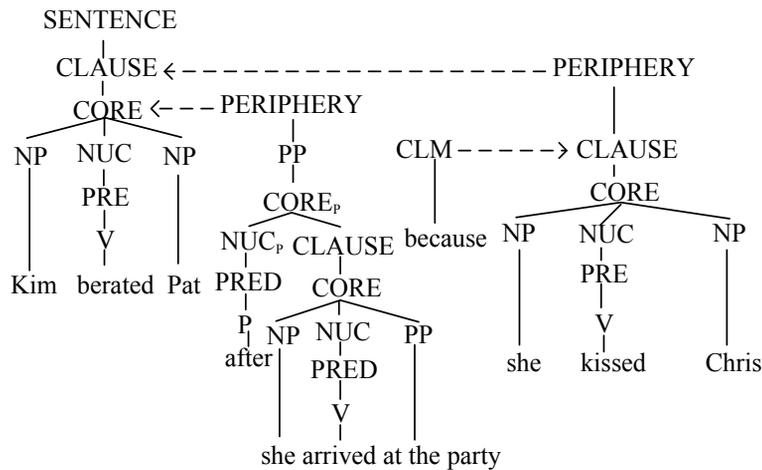


**Figure 4:** Ad-clausal subordination in English

This construction is an example of the clausal subordination juncture-nexus type. A piece of evidence that this type of adverbial clause occupies a different position from an ad-core subordinate clause comes from the fact that when the two cooccur in a single sentence, there is a definite preference for the ordering of the two clauses (Kwee 2002, Fried 2003), as shown in (8).

- (8) a. Kim berated Pat after they arrived at the party because she kissed Chris.  
 b. Kim berated Pat because she kissed Chris after they arrived at the party. ≠ (8a)

The strongly preferred ordering is (8a) with the ad-core subordinate clause preceding the ad-clausal subordinate clause; with the reverse order it is almost impossible to give the sentence the same interpretation, as the ad-core subordinate clause is construed as modifying the core in the *because*-clause, not the matrix core. This ordering preference follows from the structural differences between the two types of adverbial clauses, as Figure 5 clearly shows.



**Figure 5:** Structure of (8a) with ad-core and ad-clausal subordinate clauses

The structures assigned to these two constructions predict that the ad-core subordinate clause should be closer to the matrix core than the ad-clausal subordinate clause, and this is in fact the strongly preferred order. While the RRG theory of the layered structure of the clause permits crossing branches, English does not normally allow structures with crossing branches, and accordingly the structure in Figure 5 is the only possible one with the *after*-clause interpreted as modifying the matrix core.

Some English prepositions can also have a core as their argument; this is shown in (9).

- (9) a. Max brushed his teeth after drinking a cup of coffee.  
 b. Chris spoke to his broker before buying more stock.  
 c. Kim threw away the newspaper without reading it.

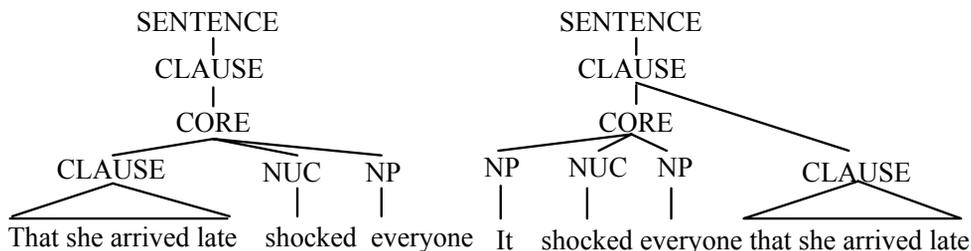
The objects of the prepositions are ‘subjectless’ gerunds, which are a type of core. There is no reason not to analyze *after drinking a cup of coffee* as an adjunct in the periphery<sub>CORE</sub>, exactly analogous to *after breakfast* and *after he drank a cup of coffee*. This would be a second type of ad-core subordination, different from (7a) only in that the linked unit is a core rather than a clause. The privileged syntactic argument of the matrix core is interpreted as the actor of the linked, subordinate core, and accordingly there is a shared core argument in this construction as well. Unlike argument gerund constructions, e.g. *Mary was surprised at Tom’s punching Sam*, however, it is not normally possible to have an overt ‘subject’ in the gerund, e.g. \**Chris spoke to his broker before his wife’s buying more stock*.

There are, therefore, two distinct types of subordination in the theory now: daughter subordination, in which the subordinate junct is a daughter of a higher node, e.g. Figure 2, and peripheral subordination, in which the subordinate junct is a modifier occurring in the periphery of a layer of the clause, e.g. Figures 4 and 5. Peripheral subordination subsumes ad-nuclear, ad-core, and ad-clausal subordination. This distinction was not made in RRG in VVLP and previous work.

#### 4. Types of subordination: symmetrical vs. asymmetrical linkage

There is a basic principle governing these complex constructions: the unmarked linkage involves units at the same level of juncture, i.e. nucleus with nucleus, core with core, clause with clause, and sentence with sentence. This default may be referred to as ‘symmetrical’ linkage. A major exception to this is complementation, the use of clauses as core arguments. This results in a larger unit being linked to a smaller unit, i.e. a clause embedded in a core. Such a linkage will be termed ‘asymmetrical’. Languages have means of resolving this asymmetry, namely extraposition. This can be seen with respect to the examples in (10); their structures are given in Figure 6.

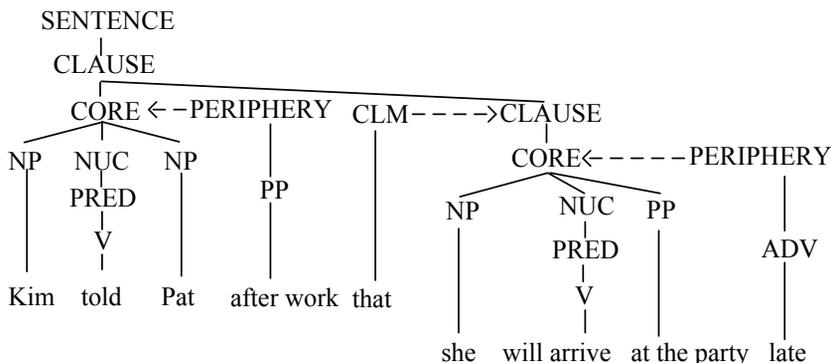
- (10) a. That she arrived late shocked everyone.                    Asymmetrical  
 b. It shocked everyone that she arrived late.                    Symmetrical



**Figure 6:** Asymmetrical vs. symmetrical linkage

In (10a) the embedded clause functions as a core argument, i.e. it is within the core, whereas in (b) it is outside the core and a direct daughter of the higher clause node. Hence in (b) the linkage is symmetrical; it is an example of clausal (daughter) subordination. The structure in (10b) is an instance of a syntax-semantics mismatch. In logical structure, the subordinate clause is a semantic argument of the verb *shock*; in (10a) it appears as a core argument, which is the default realization of an argument in logical structure, whereas in (10b) it occurs outside the core but inside the clause, its place in the core taken by a cataphoric resumptive pronoun. Hence a semantic argument of the verb occurs outside the core headed by the verb, something that also occurs in English in e.g. WH-questions.

Not all instances of complementation lead to asymmetrical linkages of this type. While non-‘subject’ *that*-clauses might appear to be examples of asymmetrical linkage, they are in fact exceptional, but not in this way. The complement clause does not fill a core argument position, despite being a semantic argument of the matrix verb; rather, it occurs as a direct daughter of the matrix clause node, just as in (10b); this is illustrated in Figure 7.



**Figure 7:** English object complement *that*-clause

English does not allow phrasal peripheral elements to occur between two core elements, and consequently because the peripheral PP *after work* occurs between *Pat* and the *that*-clause, the embedded clause must be outside of the core and a daughter of the matrix clause node. Because peripheral<sub>CORE</sub> adjuncts normally occur between the last element of the core and the embedded clause in constructions of this type, the clause must be outside of the core, as in Figure 7. While this violates the basic principle that arguments in the logical structure of the verb are realized as core arguments, it does yield a symmetrical linkage. This is the same position that extraposed *that*-clauses appear in, as shown in Figure 6. It too is an example of a syntax-semantics mismatch: the logical structure of the embedded clause is semantically an argument of the matrix verb, but syntactically it occurs outside of the core. It should be noted that it need not always be the case that object complements of this type are in an extra-core position, but it is the preferred option in many languages, since it yields a symmetrical linkage.

Ad-core subordination in Figure 3 is another example of an asymmetrical linkage, since the linked unit, the embedded clause, is contained within a sub-clausal unit, namely the periphery<sub>CORE</sub>. All of the instances of asymmetrical linkage involve subordination; in both coordination and cosubordination, units of the same type must be linked. The most extreme examples of asymmetrical embedding can be found in Wari', a Chapakuran language spoken in Brazil (Everett & Kern 1998). In this language it is possible to embed whole clauses and even sentences within the nucleus of a clause; see Everett (forthcoming) for detailed explication. This type of construction could be considered an example of daughter subordination at the nuclear level.

The existence of asymmetrical linkage raises an important question with respect to the characterization of juncture: is the juncture type defined by the level at which the linkage occurs or by the size of the linked unit? This issue was not addressed clearly in earlier work in RRG. In symmetrical linkages the two are the same, and the question does not arise. A comparison of the structures in Figure 6 shows that the answer must be the level at which the linkage occurs and not the size of the linked unit. In both of those structures the linked unit is a clause, and therefore to call both of them clausal junctures fails to distinguish them. If, however, juncture is defined in terms of the level at which the linkage occurs, then the two constructions are clearly distinct: the first is a core juncture and the second a clausal juncture. Similarly, the two adverbial clauses in (8a) are in different syntactic relationships to the matrix core and clause, and this contrast would be lost if the junctures were defined in terms of the size of the linked unit rather than in terms of where the linkage occurs.

## 5. Optional operator sharing in cosubordination

Cosubordination has traditionally been defined in terms of obligatory operator sharing at the level of juncture, but there appear to be cases of cosubordination in which operator sharing is possible but not obligatory. Bickel (2003) presents the following examples of cosubordination from Belhare (Tibeto-Burman) and Nepali (Indo-European), both spoken in Nepal, in which tense may but need not be shared across the two clauses.

- (11) a. Kimm-e    n-ta-ch-u                    ki    mun n-dhup-chi.                    Belhare  
house-LOC 3NS-reach-DU-3SG SEQ 3DU 3NS-chat.NPAST-DU  
'They will reach home and chat,' or 'When they reach home, they'll chat,'  
or 'They reached home and now they will chat.'
- b. Ghar pug-era    gāph                    gar-chann.                    Nepali  
house reach-CNV small.talk do-3PLNPAST  
'They will reach home and chat,' or 'When they reach home, they'll chat,'  
or 'They reached home and now they will chat.'

In both of these examples, which are translation equivalents of each other, the tense on the final verb may or may not be interpreted as having scope over both clauses, as the different possible translations show. This means that in some languages cosubordination involves possible rather than obligatory operator sharing; Bickel shows that this kind of operator sharing is impossible in coordination and subordination. This weakens the notion of cosubordination, but it would be incorrect to analyze the same construction as cosubordination on the shared tense reading but coordination on the non-shared tense reading, because a defining feature of clausal coordination is the impossibility of operator sharing.

## 6. Interclausal semantic relations and the interclausal relations hierarchy

The eleven juncture-nexus types, while purely syntactic, are used to express certain semantic relations between the units in the juncture, e.g. causation, purpose, and temporal sequence. These interclausal semantic relations are given in (12); the list is more extensive than that in VVLP and previous work.

(12) Interclausal Semantic Relations

- a. Causative [1]: the bringing about of one state of affairs directly by another state of affairs, usually an event or action, e.g. *Julia painted the table red.*
- b. Phase: a separate verb describes a facet of the temporal envelope of a state of affairs, specifically its onset, its termination, or its continuation, e.g. *Chris started crying, Fred kept singing, Kim finished writing the chapter.*
- c. Modifying subevents
  1. Manner: the manner in which a motion event is carried out, e.g. *Bill entered the room skipping.*
  2. Motion: motion accompanying another action, e.g. Mparntwe Arrerente *angk-tyantye-* [speak-go.upwards] ‘speak while going up’ (Wilkins 1991).
  3. Position: stance while doing an action, e.g. *Tom sat playing the guitar.*
  4. Means: the means by which an action is carried out, e.g. *Sam opened the box by slicing it with a knife.*
- d. Psych-action: a mental disposition regarding a possible action on the part of a participant in the state of affairs, e.g. *Max decided to leave, Sally forgot to open the window, Tanisha wants to go to the movies.*
- e. Purposive: one action is done with the intent of realizing another state of affairs, e.g. *Juan went to the store to buy milk, Susan brought the book to read.*
- f. Jussive: the expression of a command, request or demand, e.g. *Pat asked the student to leave, The king ordered the troops to attack the city.*
- g. Causative [2]: the bringing about of one state of affairs through a distinct action or event, e.g. *Julia forced Bill to wash the dishes.*
- h. Direct perception: an unmediated apprehension of some act, event, or situation through the senses, e.g. *Rex saw the child open the door, Yolanda heard the guests arrive.*
- i. Indirect perception: the deduction of some act, event or situation from evidence of it, e.g. (looking at an empty desk) *I see that John has gone home early.*
- j. Propositional attitude: the expression of a participant’s attitude, judgment or opinion regarding a state of affairs, e.g. *Carl believes that UFOs are a menace to the earth, Paul considers Carl to be a fool, Most fans want very much for their team to win.*
- k. Cognition: an expression of knowledge or mental activity, e.g. *Aaron*

*knows that the earth is round, George is thinking about Madeleine's refusal to go out with him.*

- l. Indirect discourse: an expression of reported speech, e.g. *Frank said that his friends were corrupt.*
- m. Direct discourse: the direct quotation of a speech event, e.g. *Frank said, "My friends are corrupt."*
- n. Circumstances: the spatial or temporal parameters of an event, e.g. (7a).
- o. Reason: the motivation or cause for an action or event, e.g. *The baby cried, because she was hungry.*
- p. Conditional: an expression of what consequence would hold, given the conditions in a particular state of affairs, e.g. *If it rains, we won't be able to have a picnic, Were Fred to leave now, he would look like a fool.*
- q. Concessive: the content of the main clause holds unexpectedly, given the content of the subordinate clause, e.g. *Bill made it to work, even though it was snowing heavily.*
- r. Temporal
  1. Simultaneous states of affairs: one state of affairs is temporally coterminous with another, e.g. *Max danced while Susan played the piano, Kim had chicken pox at the same time that Leslie had the measles.*
  2. Sequential states of affairs: one state of affairs follows another temporally, with or without any temporal overlap, e.g. *Before Juan had finished talking, Carlos entered the room, As soon as Vidhu sat down, the band began to play.*
- s. Temporally unordered states of affairs: the temporal relation between states of affairs is unexpressed, e.g. *Tyrone talked to Tanisha, and Yolanda chatted with Kareem.*

These relations may be given a formal characterization in terms of the RRG decompositional system, following a suggestion of Ohori (2001). This is new and is presented in (13).

- (13) a. Causative [1]                   ... CAUSE ...  
 b. Phase                                BECOME/INGR, KEEP, TERMINATE  
 c. Modifying subevents  
     1. Manner        **do'** (x, [MOTION' (x)] ...  $\wedge$  [MANNER.OF.MOTION' (x)])<sup>1</sup>

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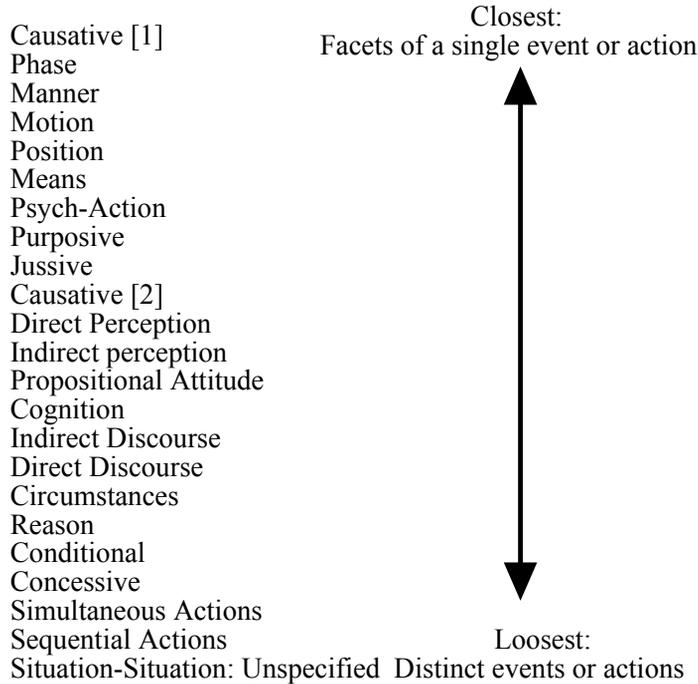
<sup>1</sup> 'VERB' (in small caps) represents the class of verbs or predicates of this type; hence, e.g. **be-lieve'** represents verbs meaning 'believe', while **BELIEVE'** represents the class of propositional attitude verbs.

2. Motion	<b>do'</b> (x, [MOTION' (x)] ... $\wedge$ [pred <sub>2</sub> ' (x, (z))])
3. Position	<b>do'</b> (x, [STANCE' (x)] $\wedge$ [pred <sub>2</sub> ' (x, (z))])
4. Means	<b>do'</b> (x, [ ... ] $\wedge$ [pred <sub>2</sub> ' (x, z)])
d. Psych-action	<b>MENTAL.DISPOSITION'</b> (x, [LS ... x ...])
e. Purposive	<b>want'</b> (x, LS <sub>2</sub> ) $\wedge$ DO (x, [LS <sub>1</sub> ] $\diamond$ CAUSE [LS <sub>2</sub> ])
f. Jussive	[ <b>do'</b> (x, [say' (x, y)])] CAUSE [MENTAL.DISP' (y, [LS ... y ...])]
g. Causative [2]	[ <b>do'</b> (x, $\emptyset$ )] CAUSE [ <b>undergo'</b> (y, [LS ... y ...])]
h. Direct perception	<b>PERCEIVE'</b> (x, [LS ... $\underline{y}$ ...])
i. Indirect perception	<b>PERCEIVE'</b> (x, [LS])
j. Propositional attitude	<b>BELIEVE'</b> ((x), [LS])
k. Cognition	<b>KNOW'</b> (x, [LS])
l. Indirect discourse	<b>do'</b> (x, [say' (x, [LS <TNS ... >])])
m. Direct discourse	<b>do'</b> (x, [say' (x, [LS <IF ... >])])
n. Circumstances	<b>be-LOC/TEMP'</b> ([LS <sub>1</sub> ], [LS <sub>2</sub> ])
o. Reason	[LS <sub>1</sub> ] <b>BECAUSE'</b> [LS <sub>2</sub> ]
p. Conditional	[LS <sub>1</sub> ] $\supset$ [LS <sub>2</sub> ]
q. Concessive	[LS <sub>1</sub> ] <b>IN.SPITE.OF'</b> [LS <sub>2</sub> ]
r. Temporal	[LS <sub>1</sub> ] $\wedge$ [LS <sub>2</sub> ] [LS <sub>1</sub> ] & [LS <sub>2</sub> ]
s. Situation-Situation	[LS <sub>1</sub> ] + [LS <sub>2</sub> ]

A few explanatory notes on these representations are in order. Causative [1] has the same logical structure as a lexical causative verb, while Causative [2] involves a matrix logical structure, the logical structure of an overt causative verb and an embedded logical structure. See Jolly (1991, 1993) for an explication of the purposive logical structure. '(x, [LS ... x ...])' means that the participant denoted by *x* is involved in both states of affairs signaled by the matrix and embedded logical structures. '(x, [LS ...  $\underline{y}$  ...])' signals a similar involvement for the participant denoted by the *y* argument, but the relationship is not the same as that in e.g. (13d); rather, it is a kind of 'raising' logical structure, in which the  $\underline{y}$  argument is simultaneously an argument of both verbs. The *x* argument in (13j) is optional, because some propositional attitude predicates are one-place and take only a propositional argument, e.g. *be true*, *be false*, *be certain*. The contrast between direct and indirect discourse is signaled by the existence of an illocutionary force operator in the embedded logical structure in direct discourse and by the lack of one in the embedded logical structure in indirect discourse. '+' signals that the relationship between the two situations is temporally unspecified.

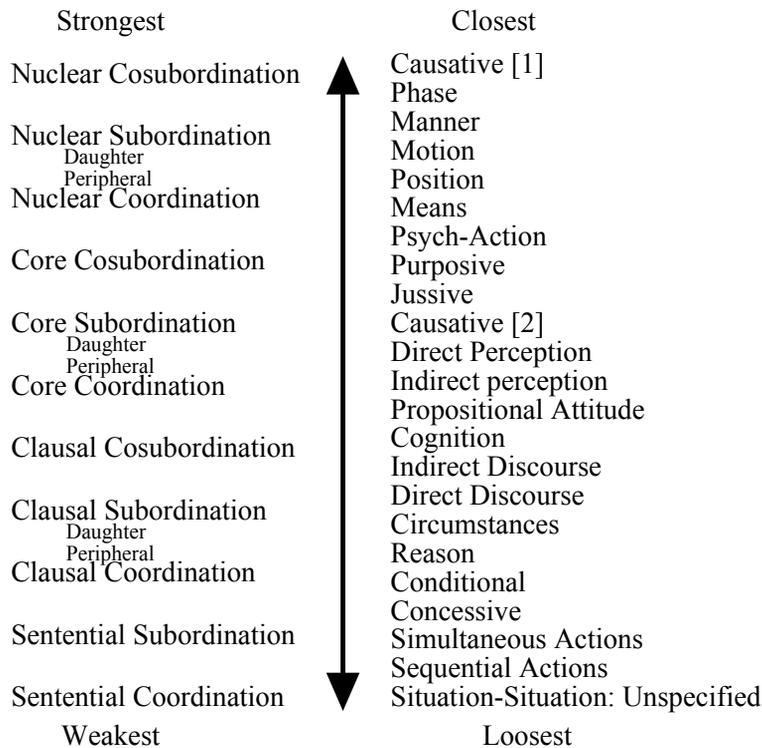
The semantic relations form a continuum expressing the degree of semantic cohesion

between the propositional units linked in the complex structure, i.e. the degree to which they express facets of a single action or event or discrete actions or events. This may be represented as in Figure 8.



**Figure 8:** Interclausal Semantic Relations Hierarchy

The syntactic linkage relations may be ranked hierarchically in terms of the strength of the syntactic bond between the units, i.e. in terms of how integrated the units are into a single unit or are coded as distinct units. The interaction of the two hierarchies is expressed in the interclausal relations hierarchy in Figure 9. While versions of this hierarchy go back to Foley & Van Valin (1984), this latest version makes more distinctions than earlier ones on both the syntactic and semantic sides.



**Figure 9:** Interclausal Relations Hierarchy

The relationship between the syntactic and semantic relations in clause linkage is very complex, i.e. it is not one-to-one, but there are some striking regularities cross-linguistically. The primary principle governing the interaction of the two hierarchies is: the closer the semantic relation between two propositions is, the stronger the syntactic link joining them. In other words, the semantic relations at the top end of the hierarchy should be realized by the linkage categories at the top as well, and the relations at the bottom of the hierarchy should be realized by the linkage categories at the bottom of the syntactic side. Moreover, while there is often more than one syntactic realization of a particular semantic relation, the tightest syntactic linkage realizing it should be tighter than the tightest syntactic linkage realizing looser semantic relations.<sup>2</sup>

<sup>2</sup> The basic iconic principle governing the syntax and semantics of clause linkage has been pointed out in Silverstein (1976) and Givón (1980). It should be noted that the semantic relations at the top end of the hierarchy are often lexicalized and not realized by a complex syntactic construction, e.g. Causative [1] as in Turkish and Lakhota. In this situation, the tightest syntactic linkage will not instantiate the top semantic relations, but this is not a counterexample to the

The syntactic side of this hierarchy is much better understood than the semantic side; interclausal semantic relations have been much less investigated in contemporary linguistics than intraclausal semantic relations like thematic relations have been. The relations listed in the hierarchy in Figure 8 do not constitute an exhaustive list of possible interclausal semantic relations, and moreover, this hierarchy is itself the result of combining a number of more basic semantic hierarchies, including (but not limited to) temporal, causal, mental disposition and necessarily shared participant hierarchies. The essential idea is that the semantic cohesion between units expressed in the hierarchy in Figure 8 follows from the interaction of a number of factors, each of which is expressed in these hierarchies. Initial approximations of the four hierarchies are given in (14)-(17).

- (14) Temporal hierarchy: phases of a single event > simultaneous events > sequential events > unspecified
- (15) Causal hierarchy: physical > verbal > underspecified [non-defeasible] > inferred [defeasible]
- (16) Participant's mental disposition: intention > perception > belief > knowledge
- (17) Necessarily shared participant hierarchy: Yes > No

In some sense the temporal hierarchy is the most fundamental: actions treated as phases of a single event are by definition going to be closer to each other semantically than actions treated as distinct events. In the causal hierarchy, 'physical' refers to some kind of physical action on the part of the causer on the causee, whereas 'verbal' means that the causer acts on the causee by means of speech; the other two involve no specification of the kind of causality, the difference between the two residing in whether the causation is explicit (underspecified) or not (inferred).<sup>3</sup> The mental disposition hierarchy concerns what kind of cognitive state of a participant is involved, and finally the necessarily shared participant hierarchy says simply that two events which necessarily share a participant are more closely related than two which do not. The interaction of

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claims of the Interclausal Relations Hierarchy. Indeed, the fact that it is the strongest semantic relations that are grammaticalized into morphological constructions, replacing the nuclear junctures, follows the basic claim of the Interclausal Relations Hierarchy: the stronger the semantic relation, the tighter the morphosyntactic bond between the units, and the evolution from a tightly bound syntactic construction to an even more tightly bound morphological construction represents a natural extension of the iconic relation between form and meaning expressed in the Interclausal Relations Hierarchy.

<sup>3</sup> Causality is a huge topic, and ideas from a variety of approaches need to be integrated in a fully fleshed out causal hierarchy, including Talmy's (2000) theory of force dynamics.

these hierarchies can be seen in the following examples.<sup>4</sup>

- (18) a. Harry shot Tom dead.  
 b. Tom died, because Harry shot him.  
 c. Having been shot by Harry, Tom died.  
 d. After Harry shot him, Tom died.  
 e. Harry shot Tom, and he died.

Only in (18a) are the shooting and Tom's dying treated as phases of a single event; this is causative [1] in (12a). In some languages this may be expressed by a single verb, e.g. German *erschiessen* 'shoot to death', Lakhota *wot'a* 'shoot to death' [LIT. 'cause to die by action from a distance']. In all of the other sentences the two are treated as distinct events, with explicit temporal sequences expressed in (c) and (d). The second example is explicit about the causal relationship, but it leaves the temporal parameters unspecified. In (18c-e) causality is nothing more than an inference; for example, all would be true of a situation in which Harry shot Tom, Tom survived the shooting but then developed a secondary infection while in the hospital and subsequently died. A case of underspecified causality would be *Harry caused Tom to open the window*; this is causative [2] in (12g). Here there is no indication whether the causation, which is explicit, is physical or verbal; it is compatible with both. What is often called 'direct manipulative causation' involves physical causality, actions which are phases of a single event and a necessarily shared participant.

The hierarchy concerning a participant's mental disposition, given in (16) is relevant to an additional important distinction in causality, namely the one illustrated in (19).

- (19) a. Harry made Tom open the window.  
 b. Harry had Tom open the window.

An important aspect of the contrast in (19) concerns the mental disposition of the causee: whether he is acting according to his own intention, as in (b) or not, as in (a). This contrast is independent of the physical vs. verbal opposition, as the following examples show.

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<sup>4</sup> These alternative expressions of causality illustrate that the higher a semantic relation is on the Interclausal Relations Hierarchy, the more likely it is that there will be multiple ways to realize it syntactically. That is, the higher the tightest linkage relation realizing a particular semantic relation is, the more looser linkage relations will be available for alternative codings of it. In (18), (a) is an example of nuclear cosubordination, (c) is clausal cosubordination, (d) is clausal subordination, and (e) is clausal coordination.

- (20) a. Harry ordered Tom to open the window.  
b. Harry asked Tom to open the window.

Both of these involve verbal causality, i.e. they are jussives, and they differ, as in (19), as to whether the causee is acting of his own accord or not.

The psych-action and purposive relations in (12) both refer to a participant's intentions; the former expresses a participant's intention or other mental disposition toward an action involving him/her, while the latter conveys a participant's intention to realize some state of affairs by means of an antecedent action. With psych-action there is a mental state and some kind of action, which may or may not temporally overlap. With purposive there are two actions which are necessarily sequential, and the participant's intention relates to both of them; this is normally expressed constructionally, as there is no verb expressing the participant's intention in the construction. Thus in characterizing these two interclausal semantic relations the mental disposition and temporal hierarchies play a role.

The temporal hierarchy is crucial in distinguishing direct from indirect perception, which involves the second value on the mental disposition hierarchy. Direct perception entails that the perceptual event and the event perceived are simultaneous, while indirect perception requires that they not be. Hence in indirect perception the perceptual event necessarily follows the deduced event. The necessarily shared participant hierarchy is relevant, too: in direct perception there is a necessarily shared participant, as indicated in (13h), whereas there is none in indirect perception.

Clausal junctures are the building blocks of texts and discourse, and the relations among clauses at the discourse level include those involving discrete events in the temporal hierarchy, as well as the kind of relations that figure prominently in discourse theories like Rhetorical Structure Theory (e.g. Matthiessen & Thompson 1988).<sup>5</sup>

The hierarchies in (14)-(17) constitute only an initial, tentative step toward decomposing the Interclausal Semantic Relations Hierarchy and providing an explanation for the upper two-thirds of it. See Ohori (2005) for an alternative approach to representing interclausal semantic relations. The lower third overlaps with the semantic relations investigated in theories of discourse structure.

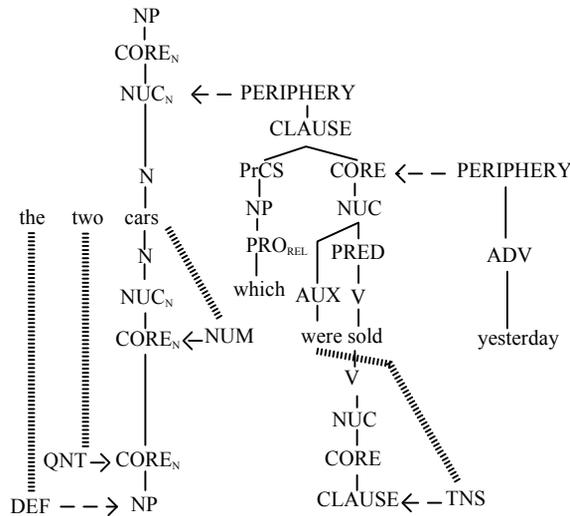
## 7. Restrictive vs. non-restrictive relative clauses

Restrictive relative clauses in a language like English, on the other hand, are

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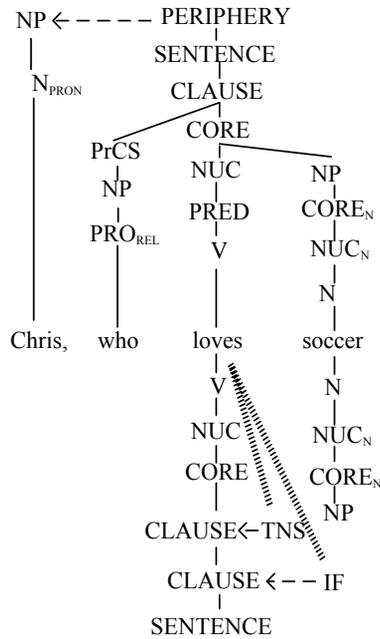
<sup>5</sup> See Winther-Nielsen (1995) for an analysis of Biblical Hebrew texts which combines the RRG theory of clause linkage with Rhetorical Structure Theory.

non-argument, i.e. peripheral, modifiers of the nominal; restrictive modifiers occur at the nuclear level. Hence it is an example of nuclear<sub>N</sub> subordination. This is represented in Figure 10.



**Figure 10:** English restrictive relative clause

Non-restrictive relative clauses have the same internal structure as restrictive relatives, but their structural relationship to the head noun is different. First, they are set off by a pause in languages like English, whereas restrictive relatives are not. Second, as the name implies, they are not restrictive modifiers; their information content is additional information about the head noun, not information used by the interlocutor to determine the reference of the head noun. Third, since they often occur with proper nouns, which normally lack a layered structure, they cannot be in the periphery modifying the nominal nucleus, as in Figure 10. Hence they must be adjuncts at the NP rather than the nuclear<sub>N</sub> level. The structure of *Chris, who loves soccer*, is given in Figure 11.



**Figure 11:** Structure of English non-restrictive relative clause

An important difference between restrictive and non-restrictive relative clauses is that non-restrictives are embedded *sentences*, not clauses, because they have a distinct illocutionary force operator from the matrix clause. It is obligatorily declarative, since a non-restrictive relative is an assertion about the head noun. Appositive XPs, e.g. *Chris, a soccer lover*, or *Tom Smith, 81*, are in the same relation to the head noun as non-restrictive relatives.

## 8. A final note

Chomsky has often pointed out that human languages contain a potentially infinite set of sentences and achieve this with a finite set of mechanisms. In RRG, this aspect of linguistic creativity is captured by the theory of complex sentences: nuclei, cores, clauses and sentences can be combined recursively by means of the different nexus types to create the range of sentences that constitute a human language.

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## 角色指稱語法中之子句聯結理論的最新發展

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角色指稱語法 (RRG) 中包含了一個關於探究子句聯結的句法與語意現象的理論架構，此理論於 Foley & Van Valin (1984) 首次發展成形後，便一直大致維持原有的架構至 90 年代末。近五年來，有關子句聯結的新研究蓬勃發展，其中包括了 Van Valin (2005) 中的有關 RRG 子句聯結理論的修改與擴充。本文便是摘要整理了有關 RRG 子句聯結理論的主要改變。

關鍵詞：角色指稱語法，子句聯結，主要理論的改變