

**Proceedings of the 10th International Conference on
Role and Reference Grammar (RRG 2009)**

2010

Wataru Nakamura (Editor)

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Editor's Note

The 10th International Conference on Role and Reference Grammar (RRG 2009) was held in University of California, Berkeley.

I am grateful to the conference organizing committee for putting the conference program together. Without their work, the conference wouldn't have been possible.

The table of contents lists 19 papers submitted by the authors. For those papers that are not included in the proceedings, I would suggest going to the following site for the handouts and slides and/or contacting the authors directly.

<http://wings.buffalo.edu/linguistics/people/faculty/vanvalin/rrg/RRG09/>

Focus fronting in the layered structure of the clause

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Abstract

This paper deals with a focusing strategy, focus fronting, whereby the focused information unit precedes the finite nucleus. Our principal concern is with the micro-parametric variation between Nuorese Sardinian, Sicilian, and Italian, three Romance languages which display focus fronting to different extents and in different modalities. We claim that whereas focus fronting in Sardinian occurs in the pre-core slot, thus paralleling fronting in German (Van Valin/Diedrichsen 2006, Diedrichsen 2008), in Sicilian focus fronting distinguishes between contrastive and completive focus. The locus of contrastive focus fronting is the pre-core slot, whilst completive focus fronting places the focused information unit in the first position in the core (Bentley 2008). The contrast between Sardinian and Sicilian illustrates two V2 strategies; one is defined by the placement of the finite nucleus in the core-initial position ([_{pre-core Slot} X] [_{core} [nucleus]...]), whilst the other is defined by the placement of the finite nucleus in the second position of the core ([_{core} X [nucleus]...]). In Italian, fronting is highly constrained, affecting only wh- and contrastive units, and leaving scope for SVO order in almost all its instances. The proposed analysis is compatible with the current understanding of fronting in Medieval Romance (Lombardi 2007; Vanelli 1986).

Key words: focus, fronting, V2, LSC.

1. Introduction *

In this study we consider a focusing strategy called focus fronting (henceforth FF) whereby the focused information unit precedes the finite verb, that is, in RRG terms, the finite part of the nucleus.¹ Our principal concern is with the micro-parametric variation between Nuorese Sardinian, Sicilian, and Italian, three Romance languages which display FF to different extents and in different modalities. The adoption of the RRG theory of clause and discourse structure enables us to shed new light on a problematic aspect of the comparative analysis of FF which has so far remained poorly understood, in particular the contrast between FF in Sardinian and Sicilian. We claim that whereas FF in Sardinian occurs in the pre-core slot, thus closely resembling fronting in German (Van Valin/Diedrichsen 2006, Diedrichsen 2008), in Sicilian FF distinguishes between contrastive and completive focus. The locus of the former is the pre-core slot, whilst the latter places the focused information unit in the first position in the core (Bentley 2008). The contrast between Sardinian and Sicilian illustrates two V2 strategies; one is defined by the placement of the finite nucleus in the first position of the core ([_{pre-core slot} X] [_{core} [nucleus]...]), whilst the other is defined by the placement of the finite nucleus in the second position of the core ([_{core} X [nucleus]...]). In Italian, contrastive focus can involve FF in the pre-core slot, whereas completive focus must be expressed post-verbally (Bentley 2008). Finally, in all the languages under investigation wh-units are fronted. Despite apparent counterevidence from the adjacency constraint on wh-fronting, we pursue the hypothesis, which is standard in RRG, that the locus of all wh-units be the pre-core slot. In accordance with this assumption we analyse adjacency in terms of semantic conditioning on the loss of V2. The proposed analysis is compatible with the current understanding of fronting in Medieval Romance (see, among others, Benincà 2004; Ledgeway 2008; Lombardi 2007; Vanelli 1986, 1999).

2. Focus fronting in Sardinian

In Sardinian, focused information units can precede the finite verb. Although this word order often characterises interrogative clauses, it is also found in declarative clauses as well as in exclamations.²

- (1a) *SU DUTTORE appo vistu.*
The doctor have.1SG seen.
'I have seen the doctor.'
- (1b) *SU DUTTORE as vistu?*
The doctor have.2SG seen.
'Have you seen the doctor?'
- (1c) *ISTRACCU est(?) (.) (!)*
Tired.MSG be.3SG

* This research was financed by the Arts and Humanities Research Council (<http://www.ahrc.ac.uk/Pages/default.aspx> - research grant AH/E506011/1) whose support is gratefully acknowledged. I am also indebted to my native-speaker informants of Nuorese Sardinian and to my helpers in the field, Gianfranco and Carminu Pintore.

¹ In our account, the term fronting does not presuppose movement. It only presupposes displacement to the extent that the unmarked word order is SVO in languages under investigation, an assumption which is challenged by the Sardinian evidence presented below.

² The data on Sardinian have in part been drawn from the secondary literature (in particular, Jones 1993 and Mensching/Remberger in press) and in part collected by the author in the following Nuorese villages: Bitti, Fonni, Orgosolo, Orosei. The abbreviations used in the glosses are as follows: F = feminine; INF = infinitive; M = masculine; OCL = object clitic; PCL = partitive clitic (Bentley 2006); PF = existential or locative pro-form (see unstressed *there* in English); PL = plural; Q = marker of polar questions; RFL = reflexive; SG = singular.

- ‘Is he tired?’ ‘He is tired.’ ‘He is tired!’
- (1d) *INOCHE ses(?) (.) (!)*
 Here be.2SG
 ‘Are you here?’ ‘You are here.’ ‘You are here!’
- (1e) *FRITTU META b’ at (?) (.) (!)*
 Cold much PF have.3SG
 ‘Is it very cold?’ ‘It is very cold.’ ‘It is very cold!’
- (1f) *MANDATU SA LITTERA appo.*
 Sent the letter have.1SG
 ‘I have sent the letter.’
- (1g) *MANDICATU IN SU RISTORANTE as?*
 Eaten in the restaurant have.2SG
 ‘Have you eaten at the restaurant?’
- (1h) *SU SARDU CHI BOLEUS PO SU TEMPUS BENNIDORI est?*
 The Sardinian which want.2PL for the time coming be.3SG
 ‘Is this the Sardinian which you want for the future?’
 (for (1h) see Mensching/Remberger in press)

The focused-fronted unit can be a referential phrase (cf. (1a-b)), a predicate (cf. (1c-d)), or a heavier information unit which comprises both a predicate and a referential phrase, as is the case with (1f-g). In the last case, the focused unit may constitute what is traditionally considered to be the verb phrase of the clause. Finally, consider (1h), where fronting affects a referential phrase which includes a subordinated clause. The focused-fronted unit always bears primary stress (Jones 1993:332, 338).

The further characteristics of Sardinian FF can be subsumed as follows. To begin with, there can only be one focused-fronted unit in the clause, as is indicated by the ungrammaticality of the examples in (2a-d). In fact, the fronted unit must be the only focused unit in the clause.

- (2a) *SU DUTTORE (*CHIE) at vistu?*
 The doctor who have.3SG seen
 ‘Who has the doctor seen?’
- (2b) *CHIE (*SU DUTTORE) at vistu?*
 Who the doctor have.3SG seen
 ‘Who has the doctor seen?’
- (2c) *A CHIE (*SU IOCÀTULU) as datu?*
 To whom the toy have.2SG given
 ‘Who did you give the toy to?’
 (Jones 1993:334)
- (2d) *A JUANNE (*UNU IOCÀTULU) appo datu (unu iocàtulu).*
 To John a toy have.1SG given a toy
 ‘I gave John a toy.’

FF is incompatible both with negation (cf. (3)) and with the interrogative marker *a* (cf. (4)), which can otherwise be found in polar Sardinian questions (cf. (5)).

- (3) *ISTRACCU (*no)est?*
 Tired.MSG not be.3SG
 ‘Is he (not) tired?’

(4) *SU DUTTORE (*a) as vistu?*
 The doctor Q have.2SG seen
 ‘Have you seen the doctor?’

(5) *A bin(d)’ a, chistiones?*
 Q PF.PCL have.3SG problems
 ‘Problems, are there any?’

FF is also clause internal (cf. (6)), and subject to a strict adjacency constraint, in that the fronted information unit must precede the nucleus immediately, including, where applicable, its operator or auxiliary, and any agreement specifications figuring in syntax on the agreement index node (Belloro 2004). In the judgement of my Nuorese informants, the adjacency condition does not distinguish between completive and contrastive focus (see (7a) for the former and (7b) for the latter). It is, however, relaxed for non-argumental referential expressions like *pro custu* ‘for this reason’ in (7c).

(6) **CUSTU LIBRU appo natu ch’ appo lessu.*
 This book have.1SG said that have.1SG read
 ‘I said that I read this book.’

(7a) *ISTRACCU (*Juanne) est.*
 Tired.MSG John be.3SG
 ‘John is tired.’

(7b) *«Petru bos at mandatu una littera.»*
 Peter OCL have.3SG sent a letter.
*«UNACARTOLINA (*Petru) nos at mandatu (Petru).»*
 A card Peter OCL have.3SG sent Peter
 ‘«Peter sent you a letter». «On the contrary, he sent us a card».’

(7c) *PRO CUSTU Juanne at isticchitusu dinari.*
 For this John have.3SG hidden the money
 ‘For this reason John has hidden the money.’

Finally, in some Sardinian varieties, FF is licensed within a finite complement clause, where the fronted unit follows the complementizer (cf. (8a)), but in no variety is it licensed within a non-finite complement regardless of the position of the fronted unit with respect to the linkage marker (cf. (8b)).

(8a) *Juannem’ at natu chi SU DUTTORE aiat vistu.*
 John OCL have.3SG said that the doctor had.3SG seen
 ‘John told me that he had seen the doctor.’

(8b) **Maria m’ at natu (a) SU DUTTORE (a) videre.*
 Mary OCL have.3SG said to the doctor to see
 ‘Mary told me to see the doctor.’
 (Jones 1993:335).

To conclude this general introduction to Sardinian FF we should note that, although this is comparable to wh-fronting, which can indeed be taken to be a sub-type of FF, there are differences between wh-fronting and the other kinds of FF. In particular, whereas wh-fronting is not compatible with another focused-fronted unit (cf. (2a-c)) or with the question marker *a* (cf. (9a)), and is subject to adjacency constraints which are comparable to those that generally

apply to FF (cf. (9b-c)), the *wh*-unit is not necessarily the only focal information unit in the clause and thus may not bear the main stress (cf. (9d)). In addition, *wh*-fronting is compatible with negation (cf. (9e)), and is not constrained to the syntactic boundary of the clause (cf. (9f)). Lastly, *wh*-units can be fronted within non-finite complement clauses (cf. (9g)).

- (9a) (*A) *chie* (*a) *est veitu?*
 Q who Q be.3SG come
 ‘Who has come?’
- (9b) *CHIE* (**Juanne*) *at vistu (Juanne)?*
 Who John have.3SG seen John?
 ‘Who did John see?’
- (9c) «*PROITTE Juanne at isticchitu su dinari?*»
 Why John have.3SG hidden the money
 ‘Why did John hide the money?’
- (9d) *A CHIE as datu SU IOCÀTULU?*
 To whom have.2SG given the toy?
 ‘Who did you give the toy to?’
- (9e) *CHIE no est veitu?*
 Who not be.3SG come
 ‘Who has not come?’
- (9f) *CALE LIBRU as natu ch’ as lessu?*
 Which book have.2SG said that have.2SG read
 ‘Which book did you say you read?’
- (9g) *No’ isco ITTE fâchere.*
 Not know.1SG what do
 ‘I do not know what to do.’
 (for (9e-g) see Jones 1993:335).

2.1 The syntax of Sardinian FF.

In the light of the above evidence we propose that, in Sardinian, focused-fronted units take the clause-external position which in RRG is called pre-core slot (Van Valin 2005:5-8). We shall now provide evidence in support of this claim.

To begin with, it seems clear that focused-fronted information units do not figure in the left-detached position. In Romance, this is typically occupied by topical units of information, and this is also the case with Sardinian.

- (10) *Sa domu, l’ at comporata Luchia.*
 The house OCL have.3SG bought Lucy
 ‘The house, Lucy bought it.’

Although the referential phrase *sa domu* ‘the house’ precedes the nucleus in (10), as is the case with focused-fronted information units, this phrase cannot be assumed to occur in the same position as focused-fronted units, in that, first, it does not bear primary stress; secondly, it is set apart from the clause by a pause, which is represented in writing by a comma, and, finally, it is doubled by a resumptive clitic pronoun, *l(a)*. Clitic doubling indicates that *sa domu* ‘the house’ is a topic.³ None of the mentioned properties characterize FF. Indeed, this can co-occur with a topical information unit in left periphery.

³ To be sure, in Sardinian, clitic doubling can also occur within the boundaries of the clause: (i) *imoi mi dha papu una pira* ‘now I shall eat it a pear’, (ii) *(n)ke soe torrau dae Kastedhu* ‘I have got back from-there from Cagliari’ (examples from Viridis 2003), similarly to what happens in European and Latin-American Spanish (Belloro

- (11) *Sa domu, COMPORATA l' as?*
 The house bought.FSG OCL have.2SG
 'The house, did you buy it?'

The topic must always precede the focused-fronted unit in the left periphery. See the counterpart of (11), which is ungrammatical:

- (11') **COMPORATA, sa domu, l' as?*
 Bought.FSG the house OCL have.2SG
 'The house, did you buy it?'

We thus assume that the topic occurs outside the clause, precisely in the left-detached position, whilst the focused-fronted unit takes a following, clause-internal, position.

Since focused-fronted units may be composed of sub-units that would otherwise belong to separate layers of the clause, as is the case with (1g), which is repeated here for convenience, the designated position of FF is unlikely to be within the core. In fact, if this were the case, a peripheral element (*in su ristorante* 'at the restaurant') would appear within the core in (1g), splitting the predicate from its aspectual operator (cf. (1g')). This operator is only represented outside the core in (1g') because operators are not considered to be part of the constituent (i.e., syntactic) projection in RRG.⁴

- (1g) *MANDICATU IN SU RISTORANTE as?*
 Eaten in the restaurant have.2SG
 'Have you eaten in a restaurant?'
- (1g') [_{Core} [_{Nuc} *MANDICATU*] *IN SU RISTORANTE*] *as?*
 Eaten in the restaurant have.2SG
 'Have you eaten at the restaurant?'

RRG does recognize, of course, that some languages license structures whereby a periphery splits the core. The problem with the structure represented in (1g'), however, is that the aspectual operator *as* 'have.2SG' does not occur in a position which represents its scope over the nucleus. In addition, if the fronted material occurred within the core, as is the case with the syntactic representation proposed in (1g'), it would be unclear exactly what position FF targets in syntax. Another relevant example is provided below.

- (12) *MORTU IN S' ISPIDALE est?*
 Dead/died in the hospital be.3SG

2004, 2007). Whether the function of clause-internal clitic doubling is comparable to that of its counterpart in Spanish is an issue which would clearly go beyond the scope of this paper, and will thus be left out of the present discussion. What should be noted here is that clause -internal clitic doubling typically refers cataphorically to the co-referent argument and is not separated from it by a pause.

⁴ In RRG only the auxiliaries that are necessary for the formation of the nucleus (e.g., *be* in English copular constructions) are represented as part of the constituent projection, whereas operators are not taken to be part of this projection because they are not predicating or referential units, and hence they are not part of the building blocks of the layered structure of the clause. In addition, whereas the position of the elements of the constituent projection is determined by language-specific ordering rules, that of operators is subject to universal scope constraints (Van Valin 2005:11-12). The matter at hand might, however, deserve further thought, since operators can be necessary for the formation of specific layers of the clause, as is the case with aspectual operators in the perfect, given that a past participle could not stand alone, i.e., without the person specifications provided on the operator.

‘Is he dead in hospital?’ / ‘Did he die in hospital?’, ‘Has he died in hospital?’

(Blasco Ferrer 1986:194).

- (12') [Core [Nuc *MORTU*] IN *S' ISPIDALE* [Nuc *est*]]?
 dead in the hospital be.3SG
 ‘Is he dead in hospital?’
 [Core [Nuc *MORTU*] IN *S' ISPIDALE*] *est*?
 died in the hospital be.3SG
 ‘Did he die in hospital?’ , ‘Has he died in hospital?’

In one possible reading of (12), ‘Is he dead in hospital?’, the predicate is split from an auxiliary, *est* ‘be.3SG’, which is essential for the formation of the nucleus, and is thus represented within the constituent projection in RRG (Van Valin 2005:13). The result is a split nucleus. In the other construal, ‘Has he died in hospital?’, the aspectual operator *est* ‘be.3SG’ is separated from the predicate over which it has scope (cf. (1g)). In both readings, it is unclear how to define the position of the focused-fronted unit on the basis of the representations in (12').

Evidence such as (1g) and (12) strongly suggests that the position of focused-fronted units is the pre-core slot.

- (1g") [PrCS *MANDICATU IN SU RISTORANTE*] *as* [Core [Nuc]]?
 Eaten in the restaurant have.2SG
 ‘Have you eaten at the restaurant?’
 (12") [PrCS *MORTU IN S' ISPIDALE*] [Core [Nuc *est*]]?
 Dead in the hospital be.3SG
 ‘Is he dead in hospital?’
 [PrCS *MORTU IN S' ISPIDALE*] *est* [Core [Nuc]]?
 Died in the hospital be.3SG
 ‘Did he die in hospital?’, ‘Has he died in hospital?’

In (1g") and the second construal of (12"), whilst being separated from the predicate, the perfective operators do have scope over the nucleus. In the first construal of (12"), the auxiliary occurs within the nucleus, as should be the case with copular structures. In addition, the nucleus is not split.

The same conclusion is reached on the basis of data like (1f), where, again, the position targeted by FF is unclear if this is taken to be inside the core. This problem does not arise, instead, if we assume that *mandatu sa littera* ‘sent the letter’ is a focal information unit which, for discourse purposes, constitutes the pre-core slot of the clause.

- (1f') [PrCS *MANDATU SA LITTERA*] *appo* [Core [Nuc]].
 Sent the letter have.1SG
 ‘I have sent the letter.’

Examples of FF such as (1f-g) and (12) are reminiscent of a fronting strategy which is commonly found in German.

- (13) *Er hat immer noch nicht die Blumen begossen,*
 He have.3SG always still not the flowers watered
aber DAS AUTO GEWASCHEN hat er gestern.
 but the car washed have.3SG he yesterday
 ‘He still has not watered the flowers, but he did wash the car yesterday.’

(Diedrichsen 2008:218-219)

Drawing upon a proposal originally put forward in Van Valin / Diedrichsen (2006), Diedrichsen (2008) suggests that the fronted unit of structures like (13) is placed in the pre-core slot. Since German is characterised by V2 order, the finite nucleus must figure in the first position in the core, with some other clause constituent (e.g., an argument) preceding it in the pre-core slot. A non-finite predicate is either placed in the pre-core slot, as is the case with *gewaschen* ‘washed’ in (13), or in the final position of the core, as with *begossen* ‘watered’ in the same example. When the predicate is non-finite, the finite operator, which, following the standard RRG analysis, Diedrichsen (2008) does not take to be part of the constituent projection, will occur immediately before the first slot in the core. This is clearly the case with the second clause in (13), where *gewaschen* ‘washed’ is fronted in the pre-core slot and the aspectual operator *hat* ‘have.3SG’ precedes the first position in the core ([_{Core} *er*...]). The result in terms of linear order is V2, in the sense that the finite verb *hat* ‘have.3SG’ is only preceded by the pre-core slot.

Interestingly, the fronted material of German structures like (13) need not constitute a single syntactic constituent, as long as it is wholly focal or topical. This is the case with *das Auto gewaschen*, lit. the car washed, in (13), if, adopting the RRG theory of non-relational syntax, we do not have a notion of verb phrase, and with the fronted unit of (14).

- (14) *Er hat vergessen, die Blumen zu gießen,*
He have.3SG forgotten the flowers to water
aber DEM HUND DAS WASSER HINGESTELLT hat er.
but the dog the water put.down have.3SG he
‘He forgot to water the plants, but he did put the water down for the dog.’
(Diedrichsen 2008: 219)

As Diedrichsen (2008:222) puts it: “It seems that at least for the pre-core slot position the demands of focus structure override the traditional notion of “constituent””. The same situation is found in Sardinian FF (cf. (1g) and (12)), although, by contrast with German, this language only appears to front focal information units in the pre-core slot.

Since Jones (1993:336) it has been suggested that Sardinian FF could be related to a general verb-second principle. After all, Medieval Romance is claimed to have exhibited V2 word order (Benincà 2004; Benincà/Poletto 2004; Ledgeway 2008; Salvi 2004; Vanelli 1986, 1999), and FF could represent what is left of this order in a group of Romance varieties, the Sardinian ones, which are notoriously archaic in many respects. Interestingly, however, the testimony of a corpus of Sardinian texts dating from the eleventh to the thirteenth centuries, has led Lombardi (2007) to claim that early Sardinian does not display V2 order, but rather V1 (i.e., VSO), in that, in these documents, the finite verb strongly tends to occur in clause-initial position, and fronting is on the whole rather sporadic. In the light of these results, Cruschina (2008) has suggested that FF might actually have developed after the Medieval times in Sardinian.

Although Lombardi’s (2007) findings might reflect the stylistic conventions of the chancery language of the Middle Ages, and, even at that stage, fronting may have been much more frequent in other registers, in the light of these results it seems undeniable that V1 or VSO order was grammatical, if not basic, in early Sardinian. In RRG term, this word order is characterized by the occurrence of the finite nucleus in the first position in the core, regardless of whether there are any fronted unit. This would still appear to be the position of the finite nucleus in the Modern Sardinian structures with FF, whereas the fronted information unit is placed in the pre-core slot. If there is a finite operator or a finite auxiliary, these will follow

the pre-core slot immediately in the string, the only difference between the two cases being that auxiliaries take the first position in the core (see the first construal of (12) in (12'')), whereas operators do not belong to the core and thus leave this empty (see (1g'')) and the second construal of (12) in (12''), where, crucially, the aspectual operators do occur in a position which marks their scope over the nucleus).

In the last analysis Sardinian FF realizes V2, in that it places the finite (part of the) nucleus - or the finite operator - in the second position in the clause, that is, in RRG terms, in the position which immediately follows the pre-core slot. Our hypothesis captures the adjacency constraint (cf. (7a-b)), inasmuch as the finite (part of the) nucleus - or the finite operator - must follow the pre-core slot immediately. Accordingly, there cannot be any intervening syntactic material between the two. Of course, the exceptions to this constraint are not explained (cf. (7c)), and we shall return to these in section 4.

The syntactic analysis also fails to capture the incompatibility of FF with negation (cf. (3)) and with the question marked *a* (cf. (4)), its being constrained to the boundaries of the clause (cf. (6)), and, finally, the fact that, in some varieties, FF is licensed within a finite complement clause, where the fronted unit follows the complementizer (cf. (8a)), but in no variety is it licensed within a non-finite complement regardless of the position of the fronted unit with respect to the linkage marker (cf. (8b)). Let us, therefore, turn to discourse and ascertain whether this is where the answer to these questions is to be sought.

2.2 Discourse constraints on Sardinian focus fronting

Jones (1993:334) points out that Sardinian FF can only apply to one element within the clause. We claim, more specifically, that the focused-fronted unit must be a single information unit as well as the only focal unit in the clause. Thus, FF fronting is incompatible with *wh*-fronting (cf. (2a-c)), and cannot be double, that is, it cannot apply to two information units (cf. (2d)).

- (2a) *SU DUTTORE (*CHIE) at vistu?*
The doctor who have.3SG seen
'Who has the doctor seen?'
- (2b) *CHIE (*SU DUTTORE) at vistu?*
Who the doctor have.3SG seen
'Who has the doctor seen?'
- (2c) *A CHIE (*SU IOCÀTULU) as datu?*
To whom the toy have.2SG given
'Who did you give the toy to?'
- (Jones 1993:334)
- (2d) *A JUANNE (*UNU IOCÀTULU) appo datu (unu iocàtulu).*
To John a toy have.1SG given a toy
'I gave John a toy.'

Significantly, Sardinian FF is not constrained to any particular type of focus and is subject to the same restrictions regardless of whether it expresses completive or contrastive focus. By way of example, consider the adjacency constraint.

- (7a) *ISTRACCU (*Juanne) est?*
Tired.MSG John be.3SG
'Is John tired?'
- (7b) *«Petru bos at mandatu una littera.»*
Peter OCL have.3SG sent a letter.

«*UNACARTOLINA* (**Petru*) *nos at mandatu (Petru).*»
 A card Peter OCL have.3SG sent Peter
 ‘«Peter sent you a letter». «A card he sent us».’

Our informants have categorically ruled out the possibility of any syntactic material intervening between the fronted unit (see *ISTRACCU* ‘tired’ in (7a) and *UNA CARTOLINA* in (7b)) and the (rest of the) nucleus, regardless of whether the focused-fronted unit is contrastive.⁵

The only possible exception to the uniform treatment of completive and contrastive focus is provided the structure illustrated in (8a), which was found to be grammatical in the Nuorese variety of Lula (Jones 1993:335), but was deemed to be ungrammatical by most of our informants, although some provided evidence which suggested that it might be acceptable if the focal information unit is contrastive.

(8a) *Juannem’ at natu chi SU DUTTORE aiat vistu.*
 John OCL have.3SG said that the doctor had.3SG seen
 ‘John told me that he had seen the doctor.’
 (Jones 1993:335).

Although some speakers deem the structure illustrated in (8a) to be grammatical, the one in (8b) is clearly ungrammatical accordingly to all speakers.

(8b) **Maria m’ at natu (a) SU DUTTORE (a) videre.*
 Mary OCL have.3SG said to the doctor to see
 ‘Mary told me to see the doctor.’
 (Jones 1993:335).

From the purely syntactic point of view, the contrast between (8a) and (8b) is puzzling. Assuming as we do that the fronted unit is placed in the pre-core slot, there would seem to be no reason for FF to be grammatical in (8a) but not in (8b). In fact, (8a) involves clausal subordination, and the fronted unit presumably occupies the pre-core slot which is within the subordinated clause. As for (8b), this appears to involve core co-ordination, as the joined units do not share any core operators (e.g., modals, negation), and thus they are not part of a single core, whilst the second unit lacks its own tense specifications, thus failing to classify as a clause. The two linked units also share one argument (the first singular object clitic ‘me’), and this is another clue that the juncture occurs at the core level. In this structure, the fronted unit could in theory be placed in the pre-core slot of the co-ordinated core, but this possibility is ruled out.

Jones (1993:335-336) notes that the same structure as (8b) is entirely grammatical with fronted wh-units (cf. (9g)), suggesting that, if wh-units take the same syntactic position as focused-fronted units, then the ungrammaticality of (8b) is to be sought outside syntax, specifically, in discourse.

(9g) *No’ isco ITTE fâchere.*
 Not know.1SG what do
 ‘I do not know what to do.’
 (Jones 1993:335).

⁵ Recall that we adopt Belloro’s (2004) proposal on the placement of agreement specifications, e.g., the clitic pronoun *nos* ‘to us’ in (7b), in the agreement index node of the nucleus.

Pursuing Jones's (1993) suggestion, we propose that the contrast between (8a) and (8b) ultimately depends on the restriction that the fronted unit must be the only focal unit in the clause. Being the only focal unit, it must occur in the first pre-core slot of the clause, which will precede the co-ordinated cores in (8b). Needless to say, the fronted unit is the only focused unit in the subordinated clause of (8a), which can be deemed to be grammatical, at least in the contrastive sense.

The reason why FF is constrained to the boundaries of the clause (cf. (6)), unlike wh-fronting, which can occur across clause boundaries (cf. (9f)), is also to be sought in discourse.

- (6) **CUSTU LIBRU appo natu ch' appo lessu.*
 This book have.1SG said that have.1SG read
 'I said that I read this book.'

- (9f) *CALE LIBRU as natu ch' as lessu?*
 Which book have.2SG said that have.2SG read
 'Which book did you say you read?'

Some native-speaker informants have pointed out that the structure in (6) would be acceptable without the subordinated clause (cf. (15)), whereas no such restriction appears to apply to wh-fronting (cf. (9f)).

- (15) *CUSTU LIBRU appo natu.*
 This book have.1SG said
 "'This book" I said.'

In (15) the fronted unit is clearly the only focal portion of its clause, occurring in the pre-core slot. By contrast, the fronted unit of (6) is not the focal unit of its clause, as it is focused in the pre-core slot of another clause. The predicate of the subordinated clause may also be to some extent new or focal, and hence the ungrammaticality of this structure.

To be sure, (6) and (15) differ in syntactic terms, insofar as only in the latter can the fronted unit be said to be within its clause boundaries. However, if discourse is not taken into consideration, the restriction to the boundaries of the clause can only be postulated rather than explained. Neither does the contrast illustrated in (6) and (9f) make sense unless one bears in mind the independent evidence which indicates that a wh-unit need not be the only focal unit in the clause (cf. (9d)) whereas other fronted units do.

Turning now to the incompatibility of FF with the marker of polar questions *a* (cf. (4)), the obvious explanation of this fact would be that the question marker *a* takes the same syntactic position as focused-fronted units, including wh-units, with which it is also incompatible (see Jones 1993:25 for this suggestion). Within our analysis this would amount to claiming that the locus of *a* be the pre-core slot. This proposal, however, would clash with the RRG assumption that operators do not occur in the constituent projection. The question marker *a* is not a referential expression (an argument or an adjunct) or a predicate, but rather an operator of illocutionary force, and thus it belongs to the operator projection. Adopting the RRG analysis of operators, we must seek elsewhere the rationale of the incompatibility of FF with *a*. Let us, therefore, consider the distribution and the function of the latter.

As pointed out by Jones (1993:24-25, 357-358), the question marker *a* is often found in requests for action, invitations, and offers, signalling that the predicate is in focus. To give one example, (16a) and (16b) contrast in that the former is a request for action, whilst (16b) is simply a request for information, and this is indicated by the presence of *a* in the former example.

(16a) A *faches su brodu?*

Q make.2SG the broth

‘Will you make the broth?’

(16b) *Faches su brodu?*

Make.2SG the broth

‘Are you making the broth?’

(Jones 1993:358)

The interrogative marker *a* can also occur in requests for information whereby the focus must be on the predicate rather than on an argument. Thus, *a* immediately precedes the nucleus, including its operators and any agreement specifications in the agreement index node, and strongly tends to co-distribute with topicalized arguments, including propositional ones.

(17a) A *n(d) e cheres, de custu?*

Q PCL want.2SG of this

‘Would you like some of this?’

(17b) A *l’ ischis chi son totu malàdidos?*

Q it know.2SG that be.3PL all ill?

‘Do you know that they are all ill?’

(17c) A *bi ses?*

Q there be.2SG

‘Are you there?’, ‘Will you be there?’

The distribution of *a* in existential constructions is particularly telling. Compare, first, the structure given above in (5), and repeated here for convenience, with its counterpart in (18).

(5) A *bin(d)’ at, chistiones?*

Q PF.PCL have.3SG problems

‘Problems, are there any?’

(18) (*A) *b’ a chistiones?*

Q PF have.3SG problems

‘Are there any problems?’

The nominal of the existential construction in (5) constitutes a classic case of ‘NE’-cliticization (Bentley 2004b, 2006), since it encodes a split referential expression which consists of an understood focal quantifier ‘some’ and its topical nominal head *chistiones* ‘problems’. By contrast, the nominal of (18) is not ‘NE’-cliticized, and hence it is not split and it is entirely focal. Although both (5) and (18) are polar questions, only the former can display the question marker *a*. This is because the focus is exclusively on the finite nucleus in (5) but not in (18).

Observe now the existential construction in (19): here, the question marker *a* is admitted, although it is not obligatory.

(19) (A) *b’ est sa sorre ‘e Luchia?*

Q PF be.3SG the sister of Lucy

‘Is Lucy’s sister there?’

Indeed, interrogative *a* has been found generally to be compatible with interrogative existentials with the copula ‘be’ (Bentley in press), that is, interrogative existential structures which introduce an identifiable referent into discourse.⁶ We propose that this compatibility is due to the possibility of construing these structures as questions on a locative existential copula. In this sense, *a b’est sa sorre ‘e Luchia* does not mean ‘does Lucy’s sister exist?’, but rather ‘is Lucy’s sister there?’, where *b’est* ‘be there’ is the finite nucleus.

The above evidence suggest that the actual focus domain of polar questions marked by *a* is the finite nucleus, including any auxiliaries, any agreement specifications in the agreement index node, and, crucially, any nuclear operators. This explains why *a* is not compatible with FF: the latter strategy does not necessarily target the nucleus (see, e.g., *SU DUTTORE as vistu?* ‘Have you seen the doctor?’), and, when it does, it only concerns the predicative part of the nucleus, leaving behind any auxiliaries, operators and agreement specifications (*ISTRACCU ses?* ‘Are you tired?’ *MANDICATU (l’)as?* ‘Have you eaten (it)?’). In sum, interrogative *a* and FF are different, and mutually exclusive, focusing strategies.

We finally turn to the incompatibility of FF with negation (cf. (3)).

- (20a) *MACCU (*no)est!*
 Mad.MSG not be.3SG
 ‘He is (not) mad!’
- (20b) *MANDICATU (*no)(l’) as?*
 Eaten not OCL have.2SG
 ‘Have you (not) eaten (it)?’
- (20c) *SU DUTTORE (*no) appo vistu.*
 The doctor not have.1SG seen
 ‘I have (not) seen the doctor.’

Since negation is an operator, again, it is not possible for us to capture these facts in terms of the competition of the fronted unit and the negation for the same syntactic position. There is, however, a straightforward explanation in discourse for the ungrammaticality of structures such as the negated ones in (20a-c). Negatives are presuppositionally marked vis-à-vis corresponding affirmatives (Givón 1975, see also Horn 1978:131). Thus, they occur in contexts where the affirmative counterpart has been mentioned, or where the speaker assumes that the hearer might contemplate it. We have seen that the focused-fronted unit is focal, i.e., not presupposed (Lambrecht 1994), and emphasised. The categorical incompatibility of FF and negation indicates that the focused-fronted unit cannot even be presupposed in the sense required by negation, i.e., within a contemplated affirmative counterpart of the proposition, as this would run counter to the discourse function of FF.

To sum up, the discourse constraints on FF explain why this strategy is restricted to one information unit, it is limited to the boundaries of the clause, it can - admittedly, marginally - occur in a subordinated clause, but not in a co-ordinated core, and, finally, it is incompatible with the question marker *a* and with negation. We now turn to Sicilian and Italian to verify whether our proposal on Sardinian FF is tenable in the light of comparative evidence from closely cognate languages.

⁶ In the majority of the Sardinian varieties the existential copula *éssere/essi* ‘be’ (cf. (19)) alternates with *áere/ai* ‘have’ (cf. (5), (18)) in accordance with a cluster of pragmatic and semantic properties of the referent of the post-copular nominal, i.e., the argument which is introduced into discourse by the construction (Bentley 2004a, in press). Thus, (19) exhibits the copula *éssere* ‘be’ because the post-copular nominal encodes a highly identifiable referent (*sa sorre ‘e Luchia* ‘Lucy’s sister’), whereas (5) and (18) exhibit *áere* ‘have’ because the post-copular nominal encodes an unidentifiable referent (*chistiones* ‘problems’).

3. The cross-dialectal perspective.

Sicilian and Italian exhibit FF to different extents. In the former language, FF can be completive or contrastive, as well as being the strategy adopted in wh-questions. Both completive and contrastive FF have affective emphatic connotations which are absent from post-nuclear focus (Cruschina 2006, 2008; Leone 1995; Sornicola 1983). Drawing upon Sperber/Wilson (1995²: 48)'s notion of relevance, Cruschina (2006, 2008) describes the pragmatic value of Sicilian FF in terms of special contextual effects created by the interconnectedness of the new information provided with old information already available in discourse.

Unlike Sardinian, Sicilian provides evidence that completive and contrastive FF differ in syntactic terms (Bentley 2008, Cruschina 2008). In particular, whereas contrastive focused-fronted units need not be adjacent to the nucleus (cf. (21a)), completive ones do (cf. (21b)).

(21a) *Chi ci accattasti a tò niputi? A biciretta?*

What OCL bought.2SG to your nephew the bike
'What did you buy for your nephew? A bike?'

NA MACHINA (a mè niputi) (ci accattai).

A car to my nephew OCL bought.1SG
'I bought a car for my nephew.'

(21b) *Chi ci accattasti a tò niputi?*

What OCL bought.2SG to your nephew
'What did you buy for your nephew?'

*NA MACHINA (*a mè niputi) (ci accattai).*

A car to my nephew OCL bought.1SG
'I bought a car for my nephew.'

In Bentley (2008) we proposed that the syntax of the replies in (21a) and (21b) be represented in the layered structure of the clause as in (21a') and (21b'), respectively.

(21a') [_{PrCS}NA MACHINA] [_{Core}a me niputi] [_{RDP}ci accattai].

(21b') [_{Core}NA MACHINA (*a me niputi) [_{Nuc}ci accattai]].

The syntactic representations in (21a') and (21b') explain why, in Sicilian, contrastive focused-fronted units can be separated from the nucleus, whilst completive ones cannot. The former type of fronted unit occurs in the pre-core slot, whereas the latter occurs in the first position in the core, thus immediately preceding the nucleus. Further examples are provided here.

(22a) [_{PrCS}NA MACHINA] [_{Core}Pippinu [_{Nuc}accattau]] [_{RDP}no a biciretta].

A car Joseph bought.3SG not a bike
'A car Joseph bought, not a bike.'

(22b) [_{Core}NA MACHINA (*Pippinu) [_{Nuc}accattau]].

A car Joseph bought.3SG
'Joseph bought a car.'

Whereas the core-initial position is available for the subject (Pippinu) in (22a), it is not in (22b), where the focal completive unit *na machina* 'a car' takes this position.

To be sure, in our analysis of Sardinian FF, we claimed that the adjacency restrictions depend on the requirement that the finite nucleus be placed in the core-initial position. We are thus proposing that adjacency is based on different types of syntax in Sardinian and Sicilian

FF. For a more in-depth discussion of adjacency we refer the reader to section 4. Here we should note that there are other reasons to believe that the syntax of Sardinian and Sicilian FF really does differ in the way outlined above. In particular, unlike Sardinian, Sicilian cannot front heavy information units which would otherwise belong to more than one syntactic layer. Contrast the Sardinian evidence in (12), which is repeated below, with the Sicilian one in (23).

- (12) *MORTU IN S' ISPIDALE est?*
 Dead/died in the hospital be.3SG
 'Is he dead in hospital?'/ 'Did he die in hospital?', 'Has he died in hospital?'
 (Blasco Ferrer 1986:194).

- (23) *MORTU (*ô SPITALI) èni?*
 Dead at-the hospital be.3SG
 'Is he dead in hospital?'

The peripheral unit *ô spitali* 'at the hospital' cannot intervene between the fronted part of the nucleus and the auxiliary 'be' in (23).⁷

Comparable evidence is offered by structures with 'do'-support. In Sicilian 'do'-support is exclusively found in progressive structures with FF.

- (24) *MANCIARI fazzu.*
 Eat.INF do.1SG
 'I am eating.' [Contextual effect: what else should I be doing?]

The usual adjacency restrictions apply. Thus, the example in (25) can only encode contrastive focus, meaning 'I am joking' as opposed to 'I am being serious'.

- (25) *BABBIARI iu fazzu.*
 Joke.INF I do.1SG
 'I am joking.' [Contextual effect: please do not get offended.]

Regardless of the completive vs. contrastive opposition, the fronted infinitive cannot be separated from its support 'do' by other fronted material which belongs to different syntactic layers, i.e., by non-nuclear units.

- (26a) *MANCIARI (*A PASTA) fazzu, no dòrmiri.*
 Eat.INF the pasta do.1SG not sleep
 'I am eating (the pasta), not sleeping.'
 (26b) *MANCIARI (*A PASTA / ô BAR) fai?*
 Eat.INF the pasta at-the café do.2SG
 'Are you eating (the pasta / in a café)?'

⁷ In Sicilian, the structure in (23) can only receive a copular reading, in that the only perfective operator of this language is *aviri* 'have'. In addition, the Sicilian perfect (auxiliary *aviri* 'have' plus past participle) is only used in restricted contexts with specific aspectual connotations, whereas the Sardinian perfect (auxiliary *éssere/essi* 'be' or *áere/ai* 'have' plus past participle) has the function of an aspectually unmarked past tense. Given that the Sicilian perfect is only used in very restricted contexts (for instance, in the presence of adverbials indicating reiteration or negation), the Sicilian counterpart of Sardinian (1f) (*MANDATU SA LÌTTERA appo* 'I have sent the letter') would be odd, if not ungrammatical, for reasons other than FF.

If, as we believe, the evidence in (23) and (26a-b) indicates that FF in Sicilian is restricted to units belonging to one single syntactic layer, then Sicilian FF sharply contrasts with Sardinian FF in this respect and this difference is not trivial.

Before we provide an explanation, we should note that within theories of clause structure other than that of Role and Reference Grammar, it would be hard to explain why Sardinian should allow fronting of the verb phrase (*MANDATU SA LITTERA appo*, lit. sent the letter I have) and Sicilian would not (*MANCIARI (*A PASTA) fazzu*, lit. eat the pasta I do). Furthermore, it would be hard to relate this contrast to that between structures such as (12) (*MORTU IN S'ISPIDALE est?*, lit. dead at the hospital is he?) and (23) (*MORTU (*Ô SPITALI) èni?*, lit. dead at the hospital is he?). Adopting the RRG theory of the layered structure of the clause, whereby the notion of verb phrase does not have any theoretical status, we have to conclude that in Sicilian it is not possible to front information units which would otherwise belong to various layers of the clause, whereas in Sardinian this kind of fronting is unproblematic.

In accordance with our findings, we suggest that FF in Sardinian and Sicilian realize two V2 strategies; one is defined by the placement of the finite nucleus in the first position in the core (cf. (27a)), whilst the other is defined by the placement of the finite nucleus in the second position in the core (cf. (27b)). In both cases, the position immediately preceding the nucleus is filled.

(27a) [_{PCS} X] [_{Core} [nucleus]...]

(27b) [_{Core} X [nucleus]...]

The former type is comparable to V2 as it is found in Modern German main clauses (cf. (13) and (14)), except that, in this language, V2 is motivated in syntactic terms, and the fronted constituent may be focal or topical. In Sardinian, the word order represented in (27a) would appear to be a continuation or a development of the word order attested in the early texts and analysed by Lombardi (2007) as VSO or V1 (see § 2.1).

The word order represented in (27b), on the other hand, is a left-over of the V2 order which is frequently found in early Romance texts (Benincà 2004; Benincà/Poletto 2004; Ledgeway 2008; Salvi 2004; Vanelli 1986, 1999), and whereby the fronted constituent is claimed to occupy a low position in the left periphery, in our terms the first position in the core. Interestingly, Vanelli (1986:262-266) points out that if, in early Italian, a heavy constituent occurs before the predicate, then it is dislocated and resumed by a co-referential pronoun within the clause. In other words, since the medieval times, this type of V2 is different from the type of fronting that is attested in Sardinian, in that it only affects syntactically simple information units. Furthermore, although (27b) differs from SVO in that the latter does not rule out an unfilled core-initial position, V2 as characterized in (27b) can be a discourse-marked option in a predominantly SVO language. SVO would indeed appear to be the predominant - or basic - word order of early Sicilian and Italian, if not, more generally, early Romance (Cruschina 2008 for Sicilian and Vanelli 1986:266-170 for Italian and Romance).

Having a dedicated position outside the core, namely the pre-core slot, Sardinian FF is not constrained to units from one syntactic layer, as it does not incur in the problem of separating nuclear operators from the syntactic layer over which they have scope. Of course, in our analysis, the predicate of a structure like (12) (*MORTU IN S'ISPIDALE est?*, lit. Dead at the hospital is he?, Died at the hospital has he?) is itself outside the nucleus. However, it is in a dedicated extra-core position for pragmatic reasons. On the contrary, if we assumed this predicate to be within the core, the nucleus would be split into two parts and it would be difficult to see exactly what position is targeted by FF.

In Sicilian, completive focused-fronted units are placed in the core-initial position. This is a single slot within the core layer, hence the ungrammaticality of FF of heavy units otherwise belonging to various syntactic layers.

We claimed above that, in Sicilian, contrastive units occur outside the core in the pre-core slot. At this point it is natural to wonder why complex contrastive units are not fronted in Sicilian (cf. (26a), *MANCIARI* (*A PASTA) *fazzu, no dòrmiri*, lit. eat (the pasta) I do, not sleep). There are two possible solutions to this puzzle. We could hypothesize that contrastive units only occur in the pre-core slot if the core-initial position is unavailable (cf. (22a), *NA MACHINA Pippinu accattau, no na bicicletta*, lit. A car Joseph bought, not a bike). If it is available, fronted contrastive units occur in the core-initial position and the nucleus will take the second position in the core, as is by default the case with Sicilian. According to this solution (which would involve a refinement of our claim on contrastive FF in Sicilian, see Bentley 2008), the focusing of complex syntactic material would be banned because it would not be licensed by the default locus of FF, i.e., the core-initial position. Alternatively, it could be said that Sicilian FF is constrained to syntactic units belonging to a single syntactic layer because, *historically*, fronting targets the core-initial position in this language. In accordance with this solution, contrastive FF in the pre-core slot is a later development by comparison with the medieval type of V2 which we described above. In this account, therefore, V2 has never involved complex syntactic material in Sicilian. In the light of comparative evidence examined below we shall subscribe to this second hypothesis.

A Romance language which, we propose, does not allow any type of fronting in the core-initial position is Modern Italian (see Bentley 2008 where we revisit a hypothesis put forward in Lambrecht 1986, 1994, Van Valin 1999). Whilst exhibiting a great deal of fronting, whether topical or focal, in its early attestations, that is, thirteenth- and fourteenth-century Florentine, Italian has moved away from V2 syntax, and the related patterns of discourse structure, to a much greater extent than Sicilian. Indeed, the only two types of FF that are licensed in Modern Italian are wh-fronting and contrastive FF. Wh-fronting is subject to adjacency restrictions which are comparable to those illustrated above (cf. (7b) vs. (7c) and (9c)).

- (28a) *CHI* (*Pietro) *ha visto* (Pietro)?
 Who Peter have.3SG seen Peter
 ‘Who has Peter seen?’
- (28b) *PERCHÉ* Pietro *è partito*?
 Why Peter be.3SG left
 ‘Why did Peter leave?’

Any FF that does not involve a wh-word requires a contrastive interpretation in Modern Italian (Benincà 1988). Thus, the reply in (29) is unacceptable in the given context.

- (29) *Che ha comprato* Pietro?
 What have.3SG bought Peter
 ‘What has Peter bought?’
- **IL PANE ha comprato* Pietro.
 The bread have.3SG bought Peter
 ‘Peter bought bread.’

Contrastive FF is not subject to any adjacency restrictions, and this suggests that it occurs in the pre-core slot.

- (30) *IL PANE Pietro ha comprato, non il latte.*
 The bread Peter have.3SG bought not the milk
 ‘Peter bought bread, not milk.’

Another clue that contrastive FF is not core-internal is that this type of focus is marked by distinctive prosodic prominence, similarly to Sardinian FF, and to contrastive FF in Sicilian. Thus, the contrastive focal subject of (31a) is not only prosodically more prominent than that of (31b), which is topical, but also than the post-nuclear subject of (31c), which expresses completive focus.

- (31a) *PIETRO ha telefonato, non Luca.*
 Peter have.3SG phoned not Luke
 ‘Peter phoned, not Luke.’
 (31b) *Pietro HA TELEFONATO.*
 Peter have.3SG phoned
 ‘Peter has phoned.’
 (31c) *Ha telefonato PIETRO.*
 Have.3SG phoned Peter
 ‘Peter has phoned (/did).’ [Context: who phoned?]

Observe that there is reason to believe that post-nuclear contrastive focus occurs in the post-core slot in Italian, in that it can follow an immediately post-nuclear argument (the Undergoer) within the core (see Bentley 2006 and references therein).

- (32) *Ha vinto il premio QUESTO STUDENTE, non quello.*
 Have.3SG won the prize this student not that
 ‘This student won the prize, not that one.’

Therefore, our analysis assigns symmetric positions to contrastive focus in Italian, the pre- and post-core slots.

On a par with Sicilian FF, Italian FF does not involve syntactic material belonging to more than one syntactic layer.

- (33) **LA MACCHINA IN GARAGE ho messo, non la bici nel capanno.*
 The car in garage have.1SG put not the bike in.the shed
 ‘I put the car in the garage, not the bike in the shed.’

In addition, Italian FF is constrained to referential phrases, whether arguments or adjuncts, thus banning nuclei or portions thereof.

- (34a) **STANCO è, non monello.*
 Tired be.3SG not naughty
 ‘He is tired, not naughty.’
 (34b) **MANGIA Paolo, non dorme.*
 Eat.3SG Paolo not sleep
 ‘Paolo is eating not sleeping.’
 (34c) **MANGIATO (l') ho, non bevuto.*
 Eaten it have.1SG not drunk
 ‘I have eaten (it), not drunk (it).’

- (34d) **MANGIANDO sto, non dormendo.*
 Eating stay.1SG not sleeping
 'I am eating, not sleeping.'

Italian FF is thus a much more restricted focusing strategy than Sardinian and Sicilian FF. Assuming, in accordance with the relevant literature, that Italian FF derives from a V2 strategy that is comparable to the Sicilian pattern, rather than the Sardinian one, we propose that, compared with Sicilian FF, Italian FF represents a further step in the advancement of SVO to the detriment of [_{core} X [nucleus]...] (cf. (27b)). Since it derives from fronting in the core-initial position, it cannot affect material belonging to more than one syntactic layer. In this sense, it patterns with Sicilian FF. In addition, it has been banned from the core-initial position altogether and constrained to the pre-core slot where it must be contrastive. The extension (Sicilian) and confinement (Italian) of FF to the pre-core slot is in accordance with the advancement of SVO, in that it leaves the core-initial position available for a non-focused S. Finally, only referential phrases can be fronted, whereas predicative ones must be focused in the nucleus within the core

In the last analysis, of the three sister languages considered above, Sardinian is the one where FF is maximally productive, as it has a dedicated syntactic position, the pre-core slot, and thus it can concern information units which would otherwise belong to more than one syntactic layer, as long as they form a single focal information unit, regardless of whether it is completive or contrastive. Sicilian allows both completive and contrastive FF, albeit with an affective connotation. By contrast with Sardinian, it places completive focus in the core-initial position, and constrains FF in the pre-core slot to contrastive (and wh-) units. Italian appears not to allow FF in the core-initial position and only admits FF of syntactically-simple referential contrastive phrases in the pre-core slot.

Before we close the discussion of Italian, we should mention so-called mirative fronting, i.e., a type of fronting which does not contrast the focal element with an antecedent that is available in the discourse context, but rather marks a piece of information as unexpected

- (35) *Caspita! L' ACQUA mi sono scordato (di comprare)!*
 Gosh The water RFL be.1SG forgotten of buy
 'Gosh! I forgot to buy water!'
 (Cruschina 2008:135)

Although, in the relevant literature (Cruschina 2008 and references therein), it has been suggested that this type of fronting actually parallels Sicilian completive FF, that is, in the terms adopted in this study, fronting in the core-initial position, in this study we shall assume that the mirative strategy needs not involve fronting at all. Indeed, structures like (35) can be analysed as follows (see also Bentley 2008).

- (35') [_{core} *L'acqua*] [_{RDP} *mi sono scordato (di comprare)!*].

This analysis explains why speakers tend not to accept structures like (36).

- (36) *?*Caspita! L' acqua, al supermercato, mi sono scordato!*
 Gosh The water at.the supermarket RFL be.1SG forgotten
 'Gosh! At the supermarket, I forgot to buy water!'

Topics tend to be pre-nuclear in Italian, occurring either in the core-initial position or in the left-detached position, as is normally the case with languages with predominant SVO

order. In addition, they do not follow foci (Bentley 2008). What is usually found in the Italian right-detached position is afterthoughts (cf. (35) and (35')), rather than topics, hence the awkwardness of (36), where *al supermercato* 'at the supermarket' would be a post-nuclear post-focal topic.

4. Wh-fronting and adjacency.

We have assumed that, whereas the lack of adjacency restrictions suggests that the fronted unit occurs outside the core (cf. (21a), (22a), (30)), the presence of such restrictions does not in itself constitute conclusive evidence that the fronted unit is within the core (cf. ((1g'') and (12'')). The former of these assumptions is, in a sense, self explanatory: the absence of adjacency constraints indicates that there is no competition with respect to the placement in the core-initial position. The latter assumption arose from the analysis of Sardinian FF. As we pointed out, although Sardinian FF is subject to a strong adjacency constraint, if it were core internal, then some of its characteristics would remain unexplained. First, it would be unclear exactly where the fronted unit occurs within the core (cf., e.g., (1f), (1g'), and (12')). Secondly, we would have to conclude that, in some Sardinian structures with FF, an operator is separated from the nucleus over which it has scope (cf. (1f), (1g'), and one reading of (12')). With respect to Sardinian structures with FF we have claimed that adjacency depends on the requirement that the finite (part of the) nucleus occur in the core-initial position.

The analysis of the adjacency restrictions which apply to wh-fronting provides further reason to assume that these do not depend deterministically on the syntactic position of the fronted unit. In particular, only some wh-units must be adjacent to the nucleus (cf. (2b-c) for Sardinian and (28a) for Italian).

- (2c) A CHIE (*SU IOCÀTULU) as datu?
 To whom the toy have.2SG given
 'Who did you give the toy to?'
 (Jones 1993:334)

- (2d) A JUANNE (*UNU IOCÀTULU) appo datu (unu iocàtulu).
 To John a toy have.1SG given a toy
 'I gave John a toy.'

- (28a) CHI (*Pietro) ha visto (Pietro)?
 Who Peter have.3SG seen Peter
 'Who has Peter seen?'

Others are not subject to adjacency: the data in (37) are from Sardinian (cf. (9c)), those in (38) from Italian (cf. (28b)).

- (37) «PROITTE Juanne at isticchitu su dinari?»
 Why John have.3SG hidden the money
 'Why has John hidden the money?'

- (38a) PERCHÉ Pietro è partito?
 Why Peter be.3SG left
 'Why did Peter leave?'

- (38b) COME MAI Pietro è partito?
 How ever Peter be.3SG left
 'How come Peter left?'

- (38c) *A QUALE DIPARTIMENTO Pietro ha chiesto aiuto?*
 To which department Peter have.3SG asked help
 ‘Which department did Peter turn to for help?’
- (38d) *A CHI DEI DUE Pietro ha detto la verità?*
 To who of.the two Peter have.3SG said the truth
 ‘To which of the two did Peter tell the truth?’

The above data suggests that the adjacency restrictions do not apply if the wh-unit is not argumental (cf. (37), (38a-b)) or is a so-called D-linked wh-unit (Cruschina 2008 and references therein), the latter being a wh-unit which is related to the previous discourse context in the sense that it presupposes a range of variables among which one must be chosen (Cruschina 2008).

Given that only some wh-units have to satisfy the adjacency requirement, it could be claimed that these occur in a core-internal position, whilst the others occur in an extra-core position. It goes without saying that this claim would not in itself constitute an explanation unless one demonstrated that the said syntactic split was principled in some way. We shall, however, take a different approach. Specifically, we claim that the adjacency constraints should be captured in terms of semantic conditioning on the loss of V2.

Starting with Sardinian, it is important to observe that, apart from FF, which is no doubt a very productive discourse strategy, this language has all the characteristics of a null-subject SVO language.

- (39) *(Juanne) at isticchitu su dinari.*
 John have.3SG hidden the money
 ‘John / He has hidden the money.’

Evidence like that presented in (37) suggests that, in the modern language, the medieval word order which requires that the nucleus occur in the core-initial position (Lombardi 2007), has not only retrenched to clauses with a focused unit, but, within these, it is in competition with SVO. As a result of this competition, the word order which we have analysed as [_{Pre-Core} Slot X] [_{Core} [nucleus]...] (cf. (27a)) yields to SVO in questions where the wh-unit is not argumental.

SVO is also the predominant word order of Modern Sicilian and Modern Italian. In fact, according to Cruschina (2008) and Vanelli (1986:266-170)), SVO was already the basic word order in medieval Sicilian and, respectively, Italian, and thus the type of V2 order which we have analysed as [_{core} X [nucleus]...] (cf. (27b)) was only an option. The adjacency restrictions which characterize completive FF in Modern Sicilian can be explained by the position of the fronted unit, which is core-initial (see § 3). The contrast between argumental and non-D-linked wh-units, which are subject to adjacency, and, on the other hand, non-argumental and D-linked ones, which are not, indicates that non-argumental and D-linked wh-units are thoroughly compatible with canonical SVO, on a par with contrastive fronted units, whereas argumental and non-D-linked wh-units are still to some extent constrained to putatively V2 order, and ban any intervening material in the available core-initial position.

The parallel between, on the one hand, non-argumental and D-linked wh-units, and, on the other, contrastive fronted units is captured by the following formulation of adjacency: the fronted unit must not be separated from the nucleus if it realizes an argument variable from an open set. There is, thus, a degree of semantic conditioning on the establishment of SVO to the detriment of V2, in that the fronting of argument variables from an open set is more resilient to canonical SVO.

In Sardinian, V2 is much stronger than in Sicilian and Italian. Thus, Sardinian FF requires that the nucleus - or the finite part thereof - occur in the second position in the string (the core-initial position, in the case of auxiliaries and predicates) regardless of whether the fronted unit takes its value from an open or a closed set. On the other hand, Sardinian does appear to differentiate between arguments and non-arguments, as suggested by the evidence provided in (37) and (39) (cf. (7c)).

- (39) *PRO CUSTU* *Juanne at* *isticchitusu dinari*.
 For this John have.3SG hidden the money
 'For this reason John has hidden the money.'

Other Romance languages would seem to be subject to stronger adjacency conditions than Italian and Sicilian (see Zubizarreta 1998:103 for Spanish), although a detailed analysis of FF in these languages would be beyond the scope of this work and will not be pursued here.

5. Conclusion

We have provided an RRG analysis of focus fronting in Sardinian Nuorese, Sicilian, and Italian, claiming that this focusing strategy is a continuation of two different V2 strategies attested in early Romance: (i) [_{Pre-Core Slot} X] [_{Core} [nucleus]...], in the case of Sardinian, and (ii) [_{Core} X [nucleus]...], in the case of Italian and Sicilian. Although in all of these languages the V2 strategy is in competition with SVO, we have suggested that SVO is better established in Modern Italian than in Modern Sicilian, and, in turn, in Modern Sicilian than in Modern Sardinian. The adoption of the layered structure of the clause has enabled us to identify the difference between the two types of fronting and to analyse the putative inconsistency of the adjacency constraint in terms of semantic conditioning on the retrenchment of V2 to the benefit of SVO.

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Towards a realizational approach to morphology in Role & Reference Grammar

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Abstract

RRG has assumed a traditional morpheme-based approach to verb morphology in which changes in verb classes are described as a combination of a base with a derivational morpheme which expresses the meaning of the derived class. This paper argues for a process-based approach in which changes in verb classes are explained in terms of changes in features. In the realizational approach to morphology described in this paper, verb class is a key morphosyntactic feature of inflectional rules. The fundamental insight of processual approaches to morphology is that morphology is a set of relationships rather than a set of morphemes.

Key words: morphology, verb classes, paradigm.

1 Introduction¹

The traditional view of the lexicon is that it is a list of the indivisible morphological units, or morphemes, in a language. In this view, the English word *dogs* consists of two morphemes: the root *dog* and the suffix *-s*. According to this view, roots and affixes are treated similarly in the lexicon with both being defined in terms of at least a phonological representation, a syntactic category, and a semantic representation. Role & Reference Grammar (RRG) has inherited this traditional view of the lexicon in which lexical units are morphemes (both words and affixes). According to Van Valin (2005:161), “[I]t is necessary to think of the lexicon as having at least two parts, one the traditional storehouse of words and morphemes, and the second a ‘workshop’ where lexical rules and other lexical processes can create new lexical forms which would not otherwise be stored.”

A competing view of the lexicon is that lexical entries are lexemes, rather than morphemes. In this view, the English words *dog* and *dogs* are the singular and plural forms/shapes of the same lexeme DOG. The property ‘PLURAL’ is a paradigmatic relationship between forms, not a unit listed in the lexicon (Spencer 1998:124). According to this view, affixes like *-s* are not lexical entries; instead, affixation is thought of as the result of an operation (Spencer 1998:124). Derived lexemes, like the adjective *doggish*, are present in the lexicon, but regular inflected forms, like *dogs*, are not in the lexicon, and neither are affixes.

A number of morphologists have argued against lexicalist approaches to morphology in which inflectional affixes are assumed to have the same status as words, and have argued for realizational approaches in which the lexicon consists of lexemes, not morphemes. In realizational approaches to morphology, inflectional morphemes are replaced by rules which relate the form of an inflected word to its morphosyntactic representation (Anderson 1984:190). The primary purpose of this paper is to describe a realizational approach to

¹ I appreciate the comments which I received on a draft from Debbie King, students in my morphology course, and participants at an academic forum at the Graduate Institute of Applied Linguistics.

inflectional morphology within RRG, and to show that an RRG lexicon need not contain inflectional morphemes.

Section 2 introduces some basic morphological concepts, while §3 briefly summarizes some of the arguments against morpheme-based approaches to the lexicon. Section 4 provides an overview of semantic representations in an RRG lexicon, while §5 briefly describes syntactic representations in RRG. Section 6 introduces a paradigm-based approach to morphology, and §7 describes the linking between semantic and syntactic representations in RRG. Section 8 shows how a paradigm-based approach to morphology operates within the RRG linking system. Finally, §9 summarizes the implications of these findings for Role & Reference Grammar.

Most of the data for this paper comes from Bonggi, a Western Austronesian language spoken in the Kudat District of Sabah, Malaysia.

2 Basic morphological concepts

“A **lexeme** is a word with a specific sound and a specific meaning. Its shape may vary depending on syntactic context” (Aronoff & Fudeman 2005:42). *Dog* and *dogs* are two different **word-forms** of the same lexeme DOG.² *Dog* occurs in contexts appropriate for a singular noun, and *dogs* in contexts appropriate for a plural noun.

Lexemes are defined by (at least) three dimensions: phonological representation, syntactic category, and semantic representation (Spencer 2004:71). A lexical entry for DOG might look something like (1), where the syntactic dimension includes subcategory information and the semantic representation specifies the meaning.

(1) DOG

Phonological representation:	/dɔg/
Syntactic category:	N
Subcategory:	count noun
Semantic representation:	dog (x) animate-object' (x), domesticated' (x), related-to-wolf' (x), natural-kind' (x)

Morphosyntactic categories are categories which are relevant to both morphology and syntax, including case, number, and gender for nouns, and tense, aspect, and modality for verbs. Each morphosyntactic category is associated with a set of **morphosyntactic properties** such as singular, plural, nominative, past, realis, etc. Word-forms are assigned **morphosyntactic features** such as [*Number:SG*] and [*Number:PL*].³

Inflection involves the formation of word-forms from a single lexeme, such as singular *dog* and plural *dogs* from the lexeme DOG. The two word-forms *dog* and *dogs* realize the morphosyntactic features ‘singular form of DOG’ and ‘plural form of DOG’. **Derivation** involves the creation of one lexeme from another. For example, the verb stem DOG₂ meaning ‘to track like a dog’ is formed by **zero-derivation** from the noun DOG₁.⁴ The verb stem DOG₂ can be inflected for tense (e.g., *dogged*) or aspect (e.g., *dogging*).

² Lexemes occur in caps, while word-forms occur in italics. See chapter 1 of Matthews (1974) for a detailed discussion of differences between lexemes and word-forms.

³ Morphosyntactic categories occur in bold italics, while morphosyntactic properties occur in small caps.

⁴ Zero-derivation is a word-formation process which changes the lexical category of a word without changing its phonological shape.

Classical morphology was concerned with the arrangement of morphemes in a particular order. For example, *dogs* results from the concatenation of the two morphemes *dog* and *-s*. In this **item-and-arrangement** view (cf. Hockett 1954), affixes have the same status as words and are listed in the lexicon. This paper takes a **word-and-paradigm** or **realizational** approach to inflectional morphology, whereby complex words such as *dogs* result from the lexeme *DOG* being assigned the morphosyntactic feature [*Number*:PL] with the [z] in [dɔgz] being an **exponent** of the feature [*Number*:PL].⁵

3 Arguments against morpheme-based approaches to the lexicon

Anderson (1992), Stump (2001), and Spencer (2004) are among the morphologists who have argued for realizational approaches to inflectional morphology in which the lexicon consists of lexemes, not morphemes. This section summarizes some of their arguments. Readers are referred to their papers and references therein for elaboration of the arguments against morpheme-based lexicons.

The form *dogs* consists of the root *dog* and a suffix *-s*. In the American Structuralist tradition associated with Bloomfield and Pike, *dog* and *-s* are morphemes which are the smallest meaningful components in a word. Under a morpheme-based theory, or lexical theory, *dog* and *-s* are both lexical entries. This means that *dogs* is no different structurally than the compound *doghouse*.

Both affixes and compounds are bound. Furthermore, affixes and compounds cannot be distinguished on the basis of potential allomorphy. Affixes (such as the English plural suffixes) frequently exhibit phonologically-conditioned allomorphy, and Mathiassen (1996:537) provides evidence of allomorphy in Lithuanian compounds. The alternation of the English indefinite article *a(n)* is evidence that allomorphy is not restricted to affixes or compounds. Neither boundedness nor allomorphy can distinguish affixation from compounding.

A morpheme-based approach treats morphemes as a linear string of phonemes which are attached to a base. However, morphosyntactic properties can be realized by suprasegmental features such as tone, stress, and nasalization. For example, in Ngambay (a language of Southern Chad with both lexical and grammatical tone), some differences in subject agreement properties are marked by grammatical tone. As seen in Table 1, 3SG subject-agreement forms are marked by low tone, while the otherwise identical 2SG subject-agreement forms have a different tone.⁶

Table 1: Ngambay

1SG	2SG	3SG
m-siɿ ‘I sit’	siɿ ‘you sit’	siɿ ‘he/she sits’
m-aiɿ ‘I drink’	aiɿ ‘you drink’	aiɿ ‘he/she drinks’

⁵ Exponents are markers of morphosyntactic features.

⁶ The prefix *m-* marks 1SG subject-agreement. Ngambay has three register tones: ˥ ‘high’, ˨ ‘mid’ and ˩ ‘low’, as well as phonetic tone glides such as the high to mid glide in *siɿ* ‘you sit’. The Ngambay data and analysis are from Christy Melick and Sarah Moeller.

Morphological properties can also be realized by changes in stress pattern (e.g., *cóntrast* – noun vs. *contrást* – verb), ablaut (e.g., *sing* ~ *sang* ~ *sung*), and consonant mutation (e.g., *house* /haus/ – noun vs. *to house* /hauz/ – verb).

Word-and-paradigm or realizational approaches to morphology stress the existence of non-concatenative phenomena. The process involves relating a basic form to a derived form by a set of phonological operations. Affixation or concatenation is treated the same as non-concatenative morphology.

Other problems in a morpheme-based approach relate to how morphemes contribute to the meaning of words. Consider the Finnish data in (2) in which the lexeme *TALO* ‘house’ is inflected for number and case.

(2)	talo	‘house’	nominative singular
	talo-t	‘houses’	nominative plural
	talo-ssa	‘in the house’	inessive singular
	talo-i-ssa	‘in the houses’	inessive plural
	talo-lla	‘at the house’	adessive singular
	talo-i-lla	‘at the houses’	adessive plural

The Finnish plural suffix *-i* occurs in all cases except nominative where the plural marker is *-t*. This means there would have to be two lexical entries meaning ‘plural’. How does the grammar know which plural marker to select when constructing a word form? In an item-and-arrangement or concatenative approach, the morphotactics of the language first has to select the plural suffix and then the case suffix. The only way to get the right form would be to subcategorize the nominative case suffix so that it appears following *-t*. In a word-and-paradigm or realizational approach, *-t* is a portmanteau affix simultaneously conveying two features: [*Number*:PL] and [*Case*:NOMINATIVE].

Morphosyntactic properties can exhibit extended exponence as illustrated by the Swahili marking of negation in (4) where negation is marked by both *h(a)-* ‘NEG’ and *ku-* ‘NEG.PST’.⁷ In negative clauses like (4), past tense is marked by *ku-* ‘NEG.PST’, whereas past tense is marked by *li-* ‘PST’ in positive clauses like (3).

(3)	ø-simba	a-li-m-shambulia	m-bwa
	CLASS9-lion	3SG.SUBJECT.AGR-PAST-3SG.OBJECT.AGR-attack	CLASS9-dog
	‘The lion attacked the dog.’		
(4)	ø-simba	h-a-ku-m-shambulia	m-bwa
	CLASS9-lion	NEG-3SG.SUBJECT.AGR-NEG.PST-3SG.OBJECT-attack	CLASS9-dog
	‘The lion did not attack the dog.’		

While non-realizational theories assume that a morphosyntactic property has one exponent, realizational theories do not require that a single property be realized by at most one exponent per word (Stump 2001:4).

Like American Structuralism, Distributed Morphology (Halle & Marantz 1993) and much of the work in Optimality Theory (McCarthy and Prince 1998) is morpheme-based. For that matter, most of work on the lexicon in RRG has also been morpheme-based.

⁷ The negative prefix *ha-* is realized as [h] before *a-* ‘3SG.SUBJECT.AGR’.

phonologically-conditioned allomorphs. In (5), the morphosyntactic feature [*Vclass*:ATTR.ST] is realized as a velar nasal [ŋ] due to nasal assimilation.

Table 3: Sample attributive stative verbs and accomplishment verbs

Roots	Attributive stative verbs		Accomplishment verbs	
ayad	m-ayad	‘ATTR.ST-pretty’	kam-ayad	‘ACL-pretty’
inji	m-inji	‘ATTR.ST-crazy’	kim-inji	‘ACL-crazy’
odom	m-odom	‘ATTR.ST-black’	kom-odom	‘ACL-black’
ubas	m-ubas	‘ATTR.ST-common’	kum-ubas	‘ACL-common’
basa?	m-basa?	‘ATTR.ST-wet’	kam-basa?	‘ACL-wet’
buka?	m-buka?	‘ATTR.ST-open’	kum-buka?	‘ACL-open’
panas	m-panas	‘ATTR.ST-hot’	kam-panas	‘ACL-hot’
puti?	m-puti?	‘ATTR.ST-white’	kum-puti?	‘ACL-white’
dalam	n-dalam	‘ATTR.ST-deep’	d<am>alam	‘ACL-deep’
doot	n-doot	‘ATTR.ST-bad’	d<om>ooot	‘ACL-bad’
sega?	n-sega?	‘ATTR.ST-red’	sega?	‘ACL-red’
tikuŋ	n-tikuŋ	‘ATTR.ST-crooked’	t<im>ikuŋ	‘ACL-crooked’
tuug	n-tuug	‘ATTR.ST-dry’	t<um>uug	‘ACL-dry’
kapal	ŋ-kapal	‘ATTR.ST-thick’	k<am>apal	‘ACL-thick’
gia	mi-gia	‘ATTR.ST-big’	g<im>ia	‘ACL-big’
lompun	mo-lompun	‘ATTR.ST-fat’	l<om>ompun	‘ACL-fat’
ramig	ma-ramig	‘ATTR.ST-cold’	r<am>amig	‘ACL-cold’

Example (6) illustrates an accomplishment verb. **Accomplishments** are non-punctual changes of state. They have the morphosyntactic feature [*Vclass*:ACL] which is realized morphologically as either a prefix *km-* or an infix *-m-*. As seen in Table 3, prefixes occur before vowel-initial roots and roots whose initial consonant is a bilabial (i.e., /b/ and /p/); infixes occur elsewhere. The prefix or infix vowel is epenthetic, being a copy of the initial vowel in the root.

Example (7) illustrates an induced state of affairs in which an actor does something resulting in a change of state to an undergoer. Induced state of affairs can occur in actor or undergoer voice. Example (7) is in actor voice. The morphosyntactic features in (7) are [*Vclass*:ISA, *Voice*:AV, *IF*:DEC]. The features [*Vclass*:ISA, *Voice*:AV] are realized morphologically as a prefix *ŋ-*. As seen in Table 4, this prefix has several phonologically-conditioned allomorphs.¹² In (7), the morphosyntactic features [*Vclass*:ISA, *Voice*:AV] are realized as a velar nasal [ŋ] as a result of the coalescence of the prefix *ŋ-* ‘ISA.AV’ with the initial consonant of the root *korin* ‘dry’.

¹² The prefix vowels in Table 4 are epenthetic, being a copy of the initial vowel in the root.

Table 4: Induced states of affairs in actor voice

Root		
ala	ŋ-ala	‘defeat someone’
elu	ŋ-elu	‘get someone drunk’
bereit	m-ereit	‘tear something’
binasa	m-inasa	‘break something’
pali?	m-ali?	‘burn someone’
pesa?	m-esa?	‘break something’
guab	ŋu-guab	‘split something open’
kakas	ŋ-akas	‘uncover something’
kotop	ŋ-otop	‘break something off’
loput	ŋo-loput	‘snap something off’
lomos	ŋo-lomos	‘choke something’
sekat	n-ekat	‘detach something’
tedak	n-edak	‘puncture something’
tutuŋ	n-utuŋ	‘burn something’

The verbs in (8), (9), and (10) are derived from the root *dabu?* ‘fall’. Example (8) illustrates an activity verb, (9) illustrates an achievement verb, and (10) illustrates an induced state of affairs in actor voice.

- (8) Dolok kaa? na d <am> abu?. /-m-/ + /dabu?/
rain near now <ACY>fall ‘ACY’ ‘fall’
‘Rain is about to fall.’
- (9) Sia n-dabu?. /n-/ + /dabu?/
3SG.NOM RLS-fall ‘RLS’ ‘fall’
‘She/he fell.’
- (10) Sia i-ŋa-dabu? sou. /i-/ + /ŋ-/ + /dabu?/
3SG.NOM RLS-ISA.AV-fall anchor ‘RLS’ ‘ISA.AV’ ‘fall’
‘He cast an anchor.’

Activities are dynamic situations which are inherently temporally unbounded. They have the morphosyntactic feature [*Vclass*:ACY] which is realized morphologically as either a prefix *m-* or an infix *-m-* when the illocutionary force is non-imperative (i.e., declarative or interrogative). Table 5 lists some motion activity verbs whose illocutionary force is non-imperative.¹³ As seen in Table 5, prefixes occur before vowel-initial roots and roots whose initial consonant is a bilabial; infixes occur elsewhere. The infix vowel is epenthetic, being a copy of the initial vowel in the root. In (8), the morphosyntactic feature [*Vclass*:ACY] is realized as an infix because the root begins with /d/. The infix vowel in (8) is a copy of the root-initial vowel.

¹³ The imperative form of these verbs is the bare root.

Table 5: Motion activity verbs with non-imperative illocutionary force

Root		
ilaŋ	m-ilaŋ	‘ACY-lie.down’
upug	m-upug	‘ACY-sit.down’
uli?	m-uli?	‘ACY-return.home’
usag	m-usag	‘ACY-stand.up’
panu	m-panu	‘ACY-walk; go’
piit	m-piit	‘ACY-send’
dua?	d < um > ua?	‘ACY-descend’
lonji	l < om > onji	‘ACY-swim’
luas	l < um > uas	‘ACY-exit’
selekei	s < em > elekei	‘ACY-ascend’
suak	s < um > uak	‘ACY-enter’
tindianj	t < im > indianj	‘ACY-turn.at.intersection’
tulak	t < um > ulak	‘ACY-depart’

Achievements are puntual changes of state. They have the morphosyntactic feature [*Vclass*:ACH]; however, this feature is not morphologically marked. The prefix *n-* in (9) marks the morphosyntactic feature [*Modality*:REALIS].

In RRG, verbs are analyzed in terms of a lexical decomposition system in which state and activity predicates are basic and the other classes are derived from them (Van Valin 2005:42). The decompositional representations of verbs are called logical structures. Logical structures express the relationship between a predicate and its arguments. Table 6 shows the lexical representations for different types of *Aktionsart* classes (cf. Van Valin 2005:45).¹⁴

Table 6: Lexical representations for *Aktionsart* classes

Verb class	Logical Structure
State	predicate' (x) or (x, y)
Accomplishment	BECOME predicate' (x) or (x, y)
Achievement	INGR predicate' (x) or (x, y)
Activity	do' (x, [predicate' (x) or (x, y)])
Active Accomplishment	do' (x, [predicate' (x, (y))]) & INGR predicate' (z, x) or (y)
Causative	α CAUSE β , where α , β are logical structures of any type

The generic logical structure (LS) for attributive stative verbs is shown in (11). The logical structure for the attributive stative verb *ŋ-korin* ‘ATTR.ST-dry’ in (5) is shown in (12), and the semantic representation (SR) for the clause in (5) is shown in (13).¹⁵

- (11) Generic LS for attributive stative verbs: **be'** (x, [**predicate'**])
- (12) LS for *ŋ-korin* ‘ATTR.ST-dry’: **be'** (x, [**dry'**])
- (13) SR for (5): **be'** (*piasu* 1SG, [**dry'**])

¹⁴ Operators like BECOME are presented in small caps, constants like **predicate'** are presented in boldface followed by a prime, and variables like x are presented in normal typeface.

¹⁵ Possessive NPs like *piasu ku* ‘my coconut’ in (5) involve a possessive predication within the NP which would be captured in a more detailed semantic representation than (13). This paper ignores information focus structure. A richer semantic representation would include the activation status of arguments (Van Valin 2005:79-80).

The generic logical structure for accomplishment verbs with an underlying attributive stative predicate is shown in (14). The logical structure for the accomplishment verb *k<om>oriŋ* ‘<ACL>dry’ in (6) is shown in (15), and the semantic representation (SR) for the clause in (6) is shown in (16).

- (14) Generic LS for accomplishment verb
with underlying attributive stative: BECOME **be'** (x, [**predicate'**])
- (15) LS for *k<om>oriŋ* ‘<ACL>dry’: BECOME **be'** (x, [**dry'**])
- (16) SR for (6): BECOME **be'** (*piasu* 1SG, [**dry'**])

Verbs which belong to the same class share the same generic logical structure. For example, all the attributive stative verbs in Table 3 have the generic logical structure in (11), and all the accomplishment verbs in Table 3 have the generic logical structure in (14).

The difference in meaning between verbs in the same class is captured by replacing the **predicate'** in the logical structure with a specific verb constant such as **dry'** in (12) and (15).¹⁶

As stated in §2, lexemes are defined by three dimensions: phonological representation, syntactic category, and semantic representation. The word-form *ŋ-koriŋ* ‘ATTR.ST-dry’ is derived from the adjective root *koriŋ* ‘dry’. The lexeme *ŊKORID* contains the information in (17) in its lexical entry (cf. the lexical entry for DOG in (1)). The semantic representation in (17) shows the logical structure of the verb.

- (17) *ŊKORID*
- | | |
|------------------------------|---------------------------------|
| Phonological representation: | /ŋkoriŋ/ |
| Syntactic category: | V |
| Subcategory: | attributive state ‘ATTR.ST’ |
| Semantic representation: | be' (x, [dry']) |

Levin and Rappaport Hovav (1998:258) point out that lexical representations can be related in two ways. First, they can share the same lexical semantic template, but have a different constant. For example, the accomplishment verbs *k<om>oriŋ* ‘<ACL>dry’ in (15) and *kam-ayad* ‘ACL-pretty’ in (18) share the same lexical semantic template, but have different constants, **dry'** and **pretty'**. The shared lexical semantic template is the generic logical structure for accomplishment verbs with an underlying attributive stative predicate shown in (14). All of the accomplishment verbs in Table 3 share the lexical semantic template in (14).

- (18) LS *kam-ayad* ‘ACL-pretty’: BECOME **be'** (x, [**pretty'**])

Second, lexical representations can contain the same constant, but have a different lexical semantic template. For example, *ŋ-koriŋ* ‘ATTR.ST-dry’ in (12) and *k<om>oriŋ* ‘<ACL>dry’ in (15) share the same constant **dry'**, but have a different lexical semantic template. The logical structure for the accomplishment verb *k<om>oriŋ* ‘<ACL>dry’ includes the operator BECOME which is not part of the lexical semantic template of stative verbs (cf. Table 6).

Van Valin (2005:47ff.) argues that related verbs can be derived by lexical rules. For further discussion of the *Aktionsart* classes listed in Table 6, including tests for determining *Aktionsart* classes, readers are referred to chapter 2 of Van Valin (2005). For detailed descriptions of other *Aktionsart* classes in Bonggi see Boutin (2007) and Boutin (2009).

¹⁶ Constants are English words since English is the semantic metalanguage used.

5 Syntactic representation in RRG

Section 4 provided an overview of semantic representations in an RRG lexicon, whereas this section briefly describes syntactic representations in RRG.

5.1 *Predicates, arguments, adjuncts, and constituent projection*

“Every language makes a distinction between predicates and arguments, and every language distinguishes between NPs/PPs which are arguments of the predicate and those which are adjuncts” (Van Valin & LaPolla 1997:27). These distinctions in clause structure are illustrated in Figure 1.

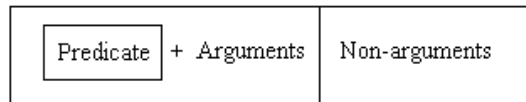


Figure 1: Universal oppositions underlying clause structure

The primary syntactic constituents of a clause are the **nucleus**, which contains the predicate, the **core**, which includes the predicate and its arguments, and the **periphery**, which consists of non-arguments (adjuncts) of the predicate. This layered structure of the clause is illustrated in Figure 2.

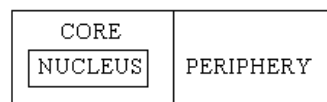


Figure 2: Layered structure of the clause

RRG only recognizes one level of syntactic representation, which is the surface syntax. The morphosyntactic representation represents the actual form of the sentence, including the linear sequence of its constituent elements and their morphological properties.¹⁷ This is illustrated by the tree in Figure 3 which shows the constituent projection for (7), repeated here as (19).

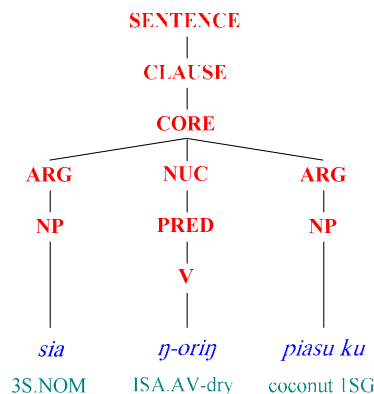


Figure 3: Constituent projection for (19)

¹⁷ According to Van Valin (2009:4), representation of the internal structure of words (or morphological representation) is part of the syntactic representation. However, the structure of words is very different from the structure of phrases and clauses.

- (19) Sia η-orij piasu ku. /η-/ + /korij/
 3SG.NOM ISA.AV-dry coconut 1SG.GEN 'ISA.AV' 'dry'
 'He is drying my coconut.'

5.2 Operator projection

Each of the major layers of the clause (nucleus, core, and clause) is modified by one or more **operators** which include grammatical categories such as tense, aspect, modality, and illocutionary force. As shown in Figure 4, operators are represented in a distinct projection of the clause from predicates and arguments.¹⁸ Tense and illocutionary force are clause-level operators.

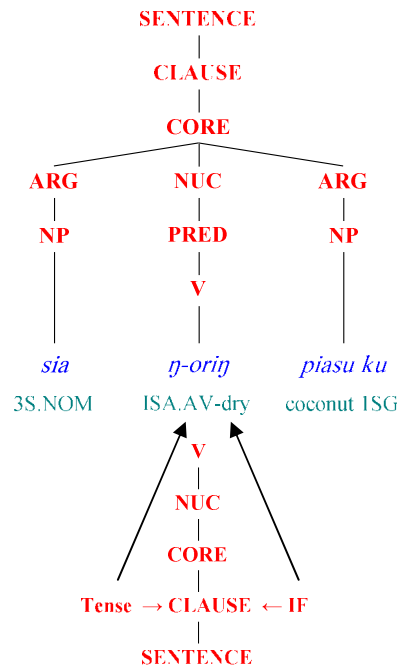


Figure 4: Constituent and operator projections for (19)

RRG recognizes only one level of syntactic representation which is directly linked with the semantic representation of the sentence (Van Valin & LaPolla 1997:21). The general structure of an RRG-based theory of grammar is presented in Figure 5.

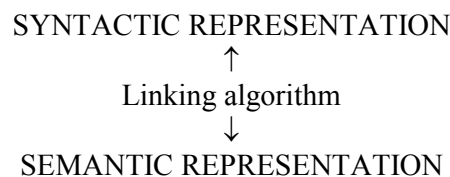


Figure 5: General structure of RRG (Van Valin & LaPolla 1997:21)

The heart of the grammar in RRG is the linking between semantic representations like (20) and syntactic representations like Figure 4 (Van Valin & LaPolla 1997:645). Before describing this linking system in §7, section 6 introduces a realizational approach to morphology.

¹⁸ Readers are referred to Van Valin & LaPolla (1997) and Van Valin (2005) for a more detailed description of syntactic representations in RRG.

(20) SR for (19): **do'** (3SG, Ø) CAUSE [BECOME **dry'** (*piasu* 1SG)]

6 Paradigm-based approach to morphology

A **morphological paradigm** is a set of morphological contrasts that a given class of lexemes can make. Morphological paradigms are defined in terms of morphological categories (e.g., *Number*), their permissible values (e.g., PLURAL), and any co-occurrence restrictions.

This section introduces a paradigm-based approach to Bonggi morphology in which morphological rules are formulated as operations on morphological expressions. Consider the subparadigm of induced states of affairs in (21)-(26).

- | | | | |
|------|------------------------|------------------|--|
| (21) | η -ori η | 'ISA.AV-dry' | actor voice, irrealis modality, non-imperative illocutionary force |
| (22) | i- η -ori η | 'RLS-ISA.AV.dry' | actor voice, realis modality, non-imperative illocutionary force |
| (23) | po- η -ori η | 'IMP-ISA.AV.dry' | actor voice, imperative illocutionary force |
| (24) | kiri η -in | 'dry-ISA.UV' | undergoer voice, irrealis modality, non-imperative |
| (25) | k<i>-ori η | '<RLS>dry' | undergoer voice, realis modality, non-imperative |
| (26) | kiri η -a? | 'dry-ISA.UV.IMP' | undergoer voice, imperative illocutionary force |

The word-forms in (21)-(26) are representative of simple causative verbs in Table 6. These verbs are described in §4 as induced state of affairs in which an actor does something resulting in a change of state to an undergoer. All induced states of affairs have a CAUSE operator in their logical structure (e.g., (20)). They are semantically transitive, having both an actor and an undergoer, either of which can be the subject. Examples (7) and (19) illustrate the verb η -ori η 'ISA.AV-dry' which is an induced state of affairs in actor voice. The actor voice (which occurs when the subject is the actor) has two prefix slots, one for modality (realis/irrealis) and illocutionary force (imperative), and one for voice. The undergoer voice (which occurs when the subject is the undergoer) has a suffix slot for voice when the verb is irrealis, and an infix slot for modality when the verb is realis. Table 7 provides a subset of morphosyntactic categories which are associated with Bonggi verbs and a subset of morphosyntactic properties which are possible values for each category. Together, the categories and properties in Table 7 show some morphosyntactic features, such as [*Vclass*:ACL] and [*Mod*:RLS].

Table 7: Selected morphosyntactic features of Bonggi verbs

Categories	Abbreviation	Properties	Abbreviation
Verb class	Vclass	attributive state	ATTR.ST
		accomplishment	ACL
		achievement	ACH
		activity	ACY
		induced states of affairs	ISA
Voice	Voice	actor	AV
		undergoer	UV
Modality	Mod	realis	RLS
		irrealis	IRR
Aspect	Asp	progressive	PRO
		iterative	ITER
Illocutionary force	IF	imperative	IMP
		non-imperative	NIMP
		declarative	DEC

Each *Aktionsart* class in Table 6 has a unique lexical representation with a unique meaning; however, a unique morpheme cannot be assigned to each *Aktionsart* class. All the verbs in (21)-(26) share the same logical structure: **do'** (x, Ø) CAUSE [BECOME **dry'** (y)]; however, they do not share the same stem. The three actor voice forms (i.e., (21), (22), and (23)) share a derived stem *η-orij* 'ISA.AV-dry'; however, the three undergoer voice forms in (24), (25), and (26) do not share a derived stem. The choice between actor or undergoer voice is an option in the linking between syntax and semantics. Tense, aspect, modality, and illocutionary force are operators (cf. §5.2).

A set of functions are needed to realize the features in Table 7. These functions are realization rules (RRs) like (27).

$$(27) \text{ RR}_{\{Vclass:ISA, Voice:AV\}, V} (<X, \sigma>) = <\eta X, \sigma>$$

Following Stump (2001), the features to be realized and the lexical class that the function refers to are given as subscripts. The function maps a pair consisting of a form X and the complete set of features characterizing the final word form. The output is another form (e.g., a root + affix, or a stem + affix) and the same complete feature set. The variable σ stands for the complete feature set of the word being computed. The realization rule in (27) states that

induced states of affairs in actor voice are formed by adding *η*- to a form X. Realization rules apply whenever the set of features which they realize is found as a subset of σ .

The rule in (28) states that induced states of affairs in actor voice and realis modality are formed by adding *i*- to a form X.

$$(28) \text{ RR}_{\{Vclass:ISA, Voice:AV, Mod:RLS\}, V} (<X, \sigma>) = <iX, \sigma>$$

When both rule (27) and rule (28) apply, (28) applies to the output of (27). Rules occur in distinct, extrinsically-ordered blocks. The ordering is defined by an index as seen in (29) and (30).

$$(29) \text{ RR}_{I, \{Vclass:ISA, Voice:AV\}, V} (<X, \sigma>) = <\eta X, \sigma>$$

$$(30) \text{ RR}_{II, \{Vclass:ISA, Voice:AV, Mod:RLS\}, V} (<X, \sigma>) = <iX, \sigma>$$

Because (29) is in block I, it applies to a root. Rule (30) applies to the stem which is the output of block I rules. The realization rule needed to produce the imperative form in (23) is shown in (31) which is a block II rule.¹⁹

$$(31) \text{ RR}_{II, \{Vclass:ISA, Voice:AV, IF:IMP\}, V} (<X, \sigma>) = <pX, \sigma>$$

Because imperatives are always irrealis, irrealis is part of the complete feature set σ in (31). Rule (30) cannot apply to the output of (31) or vice versa, because the two rules belong to the same block. This is expected since the features realis and irrealis are incompatible.

The realization rules needed to produce the undergoer voice forms in (24), (25), and (26) are shown in (32), (33), and (34).

$$(32) \text{ RR}_{I, \{Vclass:ISA, Voice:UV, IF:NIMP, Mod:IRR\}, V} (<X, \sigma>) = <Xon, \sigma>$$

$$(33) \text{ RR}_{II, \{Vclass:ISA, Voice:UV, Mod:RLS\}, V} (<CX, \sigma>) = <CiX, \sigma>^{20}$$

$$(34) \text{ RR}_{II, \{Vclass:ISA, Voice:UV, IF:IMP\}, V} (<X, \sigma>) = <Xa?, \sigma>$$

The rule in (32) belongs to block I and applies to roots producing new stems. Because the infix *-i-* does not co-occur with the undergoer voice suffix *-on*,²¹ the rule in (33) does not apply to the output of the rule in (32). Instead, the rules in block I apply vacuously, then rules (33) and (34) in block II apply to the output of the rules in block I producing forms like (25) and (26).

In a realizational approach to morphology, a word's association with a particular set of morphosyntactic properties licenses the introduction of those properties' exponents (Stump 2001:2). Morphological rules establish a correspondence between the morphosyntactic properties and phonological forms. The rules replace a list or lexicon of grammatical morphemes (cf. Anderson 1984:158). "The crucial insight behind paradigm-based morphology is that once we have paradigms we don't need (inflectional) morphemes. Inflected word forms are realizations of cells in paradigms" (Spencer 2004:72).

¹⁹ The prefix vowel in (23) is epenthetic, being a copy of the first vowel in the stem.

²⁰ The rule in (33) inserts an infix after the initial consonant of consonant-initial roots. The prefix *in-* occurs before vowel-initial roots.

²¹ This is a general feature of Philippine-type languages like Bonggi.

7 Linking in RRG

The RRG linking system works both from semantics to syntax and from syntax to semantics. The linking between semantics and syntax is governed by the Completeness Constraint in (35) (Van Valin & LaPolla 1997:325).

(35) *Completeness Constraint*

All of the arguments explicitly specified in the semantic representation of a sentence must be realized syntactically in the sentence, and all of the referring expressions in the syntactic representation of a sentence must be linked to an argument position in a logical structure in the semantic representation of the sentence.

7.1 *Linking from semantics to syntax*

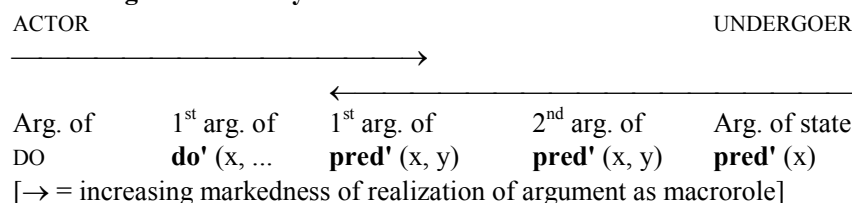
The first step in linking from semantics to syntax is to construct the semantic representation of the sentence, based on the logical structure of the predicate (Van Valin 2005:136). Returning to the example in (7) and (19), the semantic representation is shown in (20), repeated here as (36).

(36) SR for (19): **do'** (3SG, Ø) CAUSE [BECOME **dry'** (*piasu* 1SG)]

The semantic representation in (36) shows the argument structure of the verb *η-orij* 'ISA.AV-dry' in (19). Notice that the semantic representation makes no reference to semantic roles or grammatical relations (cf. Kroeger 2005:67-69). RRG uses two semantic macroroles: actor and undergoer. **Actor** refers to the entity which instigates, controls, or effects the action expressed by the verb. **Undergoer** indicates the entity affected by the action or state expressed by the verb (Walton 1986:45).

The second step in linking from semantics to syntax is to determine the actor and undergoer assignments (Van Valin 2005:136). The information that is necessary for mapping from semantic arguments to syntactic arguments can be read off the semantic representations. The relationship between macroroles and argument positions in logical structures is captured in the Actor-Undergoer Hierarchy in (37) (Van Valin & LaPolla 1997:146). This double hierarchy states that the argument position that is leftmost on the cline will be the actor and the argument position that is rightmost will be the undergoer. This is the unmarked situation; marked assignments to undergoer are possible.

(37) **Actor-Undergoer Hierarchy**



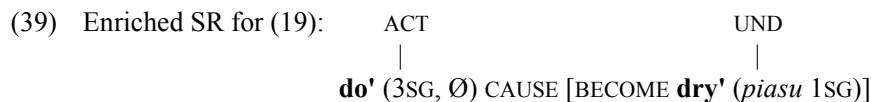
The principles for determining the number and nature of macroroles are shown in (38) (Van Valin & LaPolla 1997:152).

(38) DEFAULT MACROROLE ASSIGNMENT PRINCIPLES:

- a. Number: the number of macroroles a verb takes is less than or equal to the number of arguments in its LS.
 1. If a verb has two or more arguments in its LS, it will take two macroroles.
 2. If a verb has one argument in its LS, it will take one macrorole.
- b. Nature: for verbs which take one macrorole,
 1. If the verb has an activity predicate in its LS, the macrorole is actor.
 2. If the verb has no activity predicate in its LS, the macrorole is undergoer.

The number of macroroles a verb takes is either Ø, 1, or 2, and is largely predictable from the logical structure of the verb (Van Valin 1993:46-47). According to principle a.1 in (38), the verb *η-orij* 'ISA.AV-dry' takes two macroroles since it has two arguments in its logical structure. The argument '3SG' is the actor since it is the 1st arg. of **do'** in (36), and *piasu* 1SG 'my coconut' is the undergoer since it is single argument of a one-place state predicate **dry'** in (36).

The output of the second step in the linking process is shown in (39).



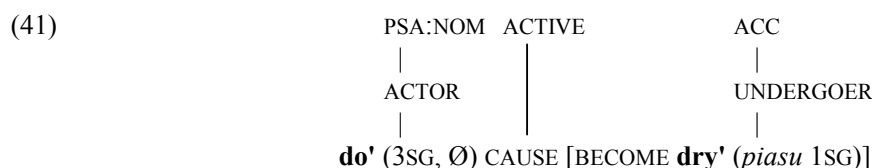
Macroroles provide the primary link between semantic representation and syntactic representation. Once arguments have been assigned to macroroles, the third step is determine the morphosyntactic coding of the arguments (Van Valin 2005:136). The most important morphosyntactic status is the subject (the privileged syntactic argument).²² For verbs with two macroroles, the default choice for subject is the actor (or active voice); however, undergoer subjects are possible resulting in a type of passive voice construction.

Part of the process involved in assigning actor and undergoer to specific morphosyntactic statuses is case and preposition assignment. Case marking rules make crucial reference to macroroles and direct core argument status (Van Valin 1993:72). The case marking rules for accusative languages like Bonggi are given in (40) (Van Valin 2005:108). The rules in (40) apply only to direct core arguments in main clauses.²³

(40) **Case marking rules for accusative constructions**

- a. The highest ranking macrorole takes NOMINATIVE case.
- b. The other macrorole takes ACCUSATIVE case.

The output of the third step in linking from semantics to syntax is shown in (41).



²² In RRG, the most important morphosyntactic status is normally referred to as the **privileged syntactic argument**. Although the grammatical relation subject is not a universal in RRG, I have elected to use the term *subject* for simplicity in this paper.

²³ Direct core arguments are non-oblique syntactic arguments which correspond to arguments in the LS. "Core arguments are those arguments which are part of the semantic representation of the verb" (Van Valin & LaPolla 1997:26). Languages typically code core arguments differently from adjuncts.

The fourth step is syntactic template selection, and the fifth step assigns arguments to positions in the syntactic representation as seen in Figure 6.²⁴

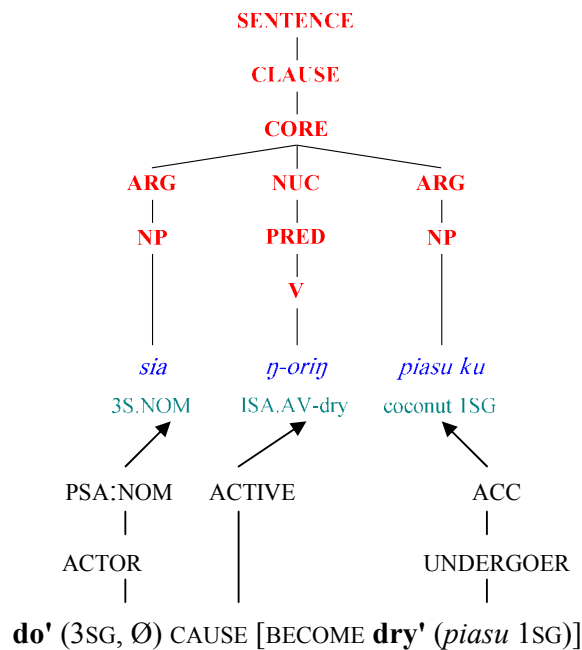
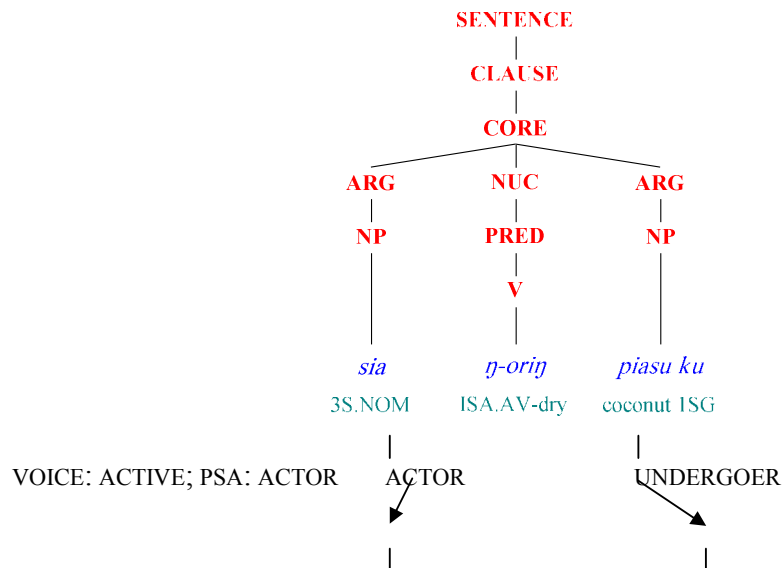


Figure 6: Linking from semantics to syntax in active voice clause

7.2 Linking from syntax to semantics

The linking between the syntactic and semantic representations is bidirectional. Linking from the syntactic representation to the semantic representation requires reference to morphosyntactic features and is illustrated in Figure 7.



²⁴ Readers are referred to Van Valin & LaPolla (1997) and Van Valin (2005) for a description of syntactic template selection and a more detailed discussion of linking.

ACTOR

UNDERGOER

do' (x, Ø) CAUSE [BECOME **dry'** (y)]

Figure 7: Linking from syntax to semantics in active voice clause

The first step in linking from syntax to semantics is to identify the verb and its voice (Van Valin 2005:151). The verb *η-orig* 'ISA.AV-dry' in (19) is an actor voice transitive verb.

The second step in linking from syntax to semantics is to determine the macrorole(s) and other core argument(s) in the clause. Because the verb in (19) is an actor voice transitive verb, the subject is the actor. The NP following the verb in (19) is a direct core argument so it must be the undergoer.

The third step involves retrieving the logical structure of *η-orig* 'ISA.AV-dry' from the lexicon, **do'** (x, Ø) CAUSE [BECOME **dry'** (y)], and assigning macroroles: x = actor and y = undergoer. The arguments from the sentence are then linked to the logical structure arguments as seen in Figure 7.

8 Linking in RRG within a paradigm-based approach to morphology

Sections 7.1 and 7.2 have provided an overview of the bidirectional linking system in RRG. While the linking algorithms neatly link semantic predicates and their arguments with predicates and arguments in syntax, differences in inflectional morphology of the verb have not been addressed in the algorithms described. According to §7.2, linking from syntax to semantics involves retrieving the logical structure of the verb from the lexicon. The implication is that the lexicon includes every inflected form of every verb!

8.1 Linking from semantics to syntax

Van Valin (2005:52-53) shows how the inflectional features of modality, aspect, and illocutionary force which are described in Table 7 can be incorporated into semantic representations. This is illustrated by the enriched semantic representation in (42) which excludes nominal operators.

(42) SR for (19): <_{IF}DEC <_{MOD}IRR < **do'** (3SG, Ø) CAUSE [BECOME **dry'** (*piasu* 1SG)] >>>

Each verb class has a unique lexical representation (cf. Table 6). Therefore, the inclusion of information about tense, aspect, modality, and illocutionary force in semantic representations means that all of the morphosyntac features in Table 7 (with the exception of voice) can be determined from semantic representations. As stated in §7.1, the choice between actor or undergoer voice is an option in the linking from semantics to syntax.

The inflectional features (e.g., modality, aspect, and illocutionary force) included in enriched semantic representations like (42) match the inflectional morphosyntac features in realization rules. In other words, the realization rules in §6 are part of the system of linking from semantics to syntax. They produce the exponents of the feature sets found in each rule.

Stump (2001) is concerned with inflectional morphology; yet, the features in Table 7 are a mixture of derivational and inflectional features. According to Stump (1998:13), "The structure of paradigms in a given language is determined by the inventory of morphosyntactic properties available in that language." Stump's morphosyntactic properties of verbs include the properties associated with the categories voice, modality, aspect, and illocutionary force in Table 7, but exclude the properties associated with verb class (cf. Stump 1998:28). The verb class or *Aktionsart* class properties (e.g., state, accomplishment, achievement, activity, etc.)

belong to what Stump refers to as lexicosemantic properties. According to Stump (1998:2), lexicosemantic properties like ‘stative’ determine the semantic composition.

Stump and Spencer make a clear distinction between inflection and derivation. Derivation encodes lexicosemantic relations within the lexicon, while inflection encodes phrase-level properties and relations (Stump 1998:22).

Like Stump, RRG views differences in *Aktionsart* classes as lexical. The different verb classes in Table 6 have different logical structures and different meanings. Differences in morphology which correspond to differences in *Aktionsart* classes are clearly derivational. On the other hand, operators like tense, aspect, modality, and illocutionary force are clearly inflectional (see §5.2). Differences in voice, which are accounted for by the principles in (37) and (38), result from different linking choices outside of the lexicon.

Linguists widely assume that derivational morphological processes within the lexicon take place before inflectional processes. Given this view and an item-and-arrangement approach to morphology, one would assume that verbs which belong to the same class share the same stem. Consider the Bonggi stems in Table 8 which are inflected for realis modality.

Table 8: Realis allomorphs

	Root	Inflected stem	Gloss	Verb class & voice	Realis marker	Inflectional form
a.	ala	i-ŋala	‘defeat someone’	ISA.AV	i-	prefix
b.	ala	in-ala	‘defeat someone’	ISA.UV	in-	prefix
c.	tutuŋ	n-tutuŋ	‘burnt’	ACHIEVEMENT	n-	prefix
d.	tutuŋ	i-nutuŋ	‘burnt something’	ISA.AV	i-	prefix
e.	tutuŋ	t < i > utuŋ	‘burnt something’	ISA.UV	<i>	infix
f.	pesa?	i-pesa?	‘broken’	ACHIEVEMENT	i-	prefix
g.	pesa?	i-mesa?	‘broke something’	ISA.AV	i-	prefix
h.	pesa?	p < i > esa?	‘broke something’	ISA.UV	<i>	infix
i.	titik	i-nitik	‘beat an instrument’	ISA.AV	i-	infix
j.	titik	b < in > ereit	‘tear something’	ISA.UV	<in>	infix
k.	odom	k < i > modom	‘became black’	ACCOMPLISHMENT	<i>	infix
l.	panas	k < i > mpanas	‘became hot’	ACCOMPLISHMENT	<i>	infix
m.	tikuŋ	t < i > mikuŋ	‘became crooked’	ACCOMPLISHMENT	<i>	infix
n.	upug	m < i > upug	‘sat down’	ACTIVITY	<i>	infix
o.	tindiaŋ	t < i > mindiaŋ	‘turn at intersection’	ACTIVITY	<i>	infix
p.	mati	meti	‘died’	ACHIEVEMENT	e	ablaut

Table 8 shows that Bonggi has six distinct forms for marking realis modality: three prefixes *i-*, *in-*, and *n-* as seen in rows (a-c); two infixes *<i>* and *<in>* as seen in rows (e and j); and ablaut as seen in row (p). With the exception of ablaut, which is a suppletive form, both the phonological shape (/i/, /in/, or /n/) and the position (prefix or infix) are predictable. The shape of the inflected forms is conditioned by the phonology; however, the position of the inflected forms is conditioned by lexical semantics (i.e., *Aktionsart* class). Realis modality is always marked by a prefix for achievements (e.g., rows c and f in Table 8) and actor voice induced states of affairs (e.g., rows a, d, g, and i). Infixes can only occur with undergoer voice induced states of affairs (e.g., rows e, h, and j), activity verbs (e.g., rows n and o), and accomplishment verbs (rows k, l, and m). The position of the realis modality marker provides information about the possible verb class. In other words, part of the functional yield of the

realis marker is carried by the templatic position, rather than exclusively by the segmental make-up.

The two rules in (30) and (33) interact with a set of phonological processes to produce the realis markers for the induced states of affairs in Table 8 (i.e., rows a, b, d, e, g, h, i, and j). Rules (30) and (33) do not produce the realis markers for other verb classes since they only apply to verbs with the feature [*Vclass*:ISA]. Other rules, such as the one for achievement verbs in (43), are required to produce the realis forms for other verb classes.

$$(43) \text{RR}_{\text{II},\{\text{Vclass:ACH}, \text{Mod:RLS}\}, \text{V}(\langle \text{X}, \sigma \rangle)} = \langle \text{n/iX}, \sigma \rangle$$

Rule (43) interacts with a set of phonological processes to produce the realis prefixes for the achievement verbs in rows c and f of Table 8. Realis achievement verbs are marked by [n] if the root begins with an alveolar, otherwise they are marked by [i]. Rule (43) does not apply to the ablaut form *meti* ‘died’ in row p because an ablaut rule which belongs to the same morphological block is more narrowly applicable than rule (43). Ablaut overrides rule (43) in accordance with the Pāṇini principle. “Choices among rules belonging to the same block are determined by a single universal principle (Pāṇini’s principle), according to which the narrowest applicable rule always overrides other applicable members of the same block” (Stump 2001:33).

A single affix frequently serves as a cumulative exponent. For example, the infix <i> in row e of Table 8 serves simultaneously as an exponent of the morphosyntactic features [*Vclass*:ISA], [*Voice*:UV], and [*Mod*:RLS].

Although the realis allomorphs in Table 8 are dependent upon the verb class, verbs that belong to the same class are not necessarily inflected the same. Specifically, induced states of affairs are treated differently depending on whether they are actor voice or undergoer voice. Furthermore, as pointed out in §6, the three undergoer voice forms in (24), (25), and (26) do not share a derived stem. This is not a problem in a paradigm-based approach.

8.2 Linking from syntax to semantics

Because linking from syntax to semantics involves interpreting overt morphosyntactic forms, it is more difficult than linking from semantics to syntax (Van Valin 2005). However, Bonggi speakers can predict much of the semantics from the morphological shape of the verb. For example, given a hypothetical verb root whose shape is /root/, listeners can usually determine the following from the surface morphology of the verb: verb class, voice, modality, and whether or not the illocutionary force is imperative as seen in Table 9.

Table 9: Verb class, voice, modality, and illocutionary force predictions given hypothetical root /root/

Morphological Shape	Verb class	Voice	Modality	IF
mo-root	attributive state/			
	achievement		irrealis	
i-root	achievement		realis	
r<om>oot	activity/accomplishment		irrealis	
r<i><m>oot	activity/accomplishment		realis	
root	activity		irrealis	imperative
ŋo-root	induced state of affairs	actor	irrealis	
i-ŋo-root	induced state of affairs	actor	realis	
po-ŋo-root	induced state of affairs	actor	irrealis	imperative
r<i>oot	induced state of affairs	undergoer	realis	
root-on	induced state of affairs	undergoer	irrealis	
root-a?	induced state of affairs	undergoer	irrealis	imperative
root-an	induced state of affairs	marked undergoer	irrealis	
root-ei	induced state of affairs	marked undergoer	irrealis	imperative

Although activity verbs and accomplishment verbs usually cannot be distinguished on the basis of morphological shape alone, if the subject is an actor then it is an activity, if the subject is an undergoer it is an accomplishment.

9 Conclusion

This paper has argued for a realizational approach to inflectional morphology within RRG in which inflectional morphemes are replaced by rules which relate the form of an inflected word to its morphosyntactic representation. Previous work on a realizational approach to morphology in RRG includes Everett (2002) and Martín Arista (2008).

Van Valin and LaPolla (1997), Van Valin (2005:158), and Cortés Rodríguez's (2006) claim that derivational affixes which change syntactic category occur in the lexicon. For example, both Cortés Rodríguez (2006:43) and Van Valin and LaPolla (1997:188) explain English agent nominalization by means of the lexical rule in (44).

- (44) verb + er \rightarrow [_N verb + er] 'x_i which verbs' ([_{LS}... (x_i, ...) ...]), where 'x' is the actor argument in the logical structure.

The rule in (44) is a word formation rule which applies to a verb base to produce a noun. The lexical material in (44) includes both lexemes and affixes. Cortés Rodríguez (2006) argues that derivational affixes are lexical units. According to him, derivational affixes should have a logical structure like lexemes.²⁵

This paper has not addressed whether or not derivational affixes which change syntactic category should occur in the lexicon. The derivational processes which are described in this paper do not involve a change in syntactic category. Instead, they involve a change in verb class as when the logical operator BECOME is added to the stative predicate **be'** (x, [**dry'**]) in (12), resulting in the accomplishment BECOME **be'** (x, [**dry'**]) in (15) with its concomitant morphology. This type of derivational process is extremely productive in Bonggi as when the attributive state in (5), the accomplishment in (6), and the induced states of affairs in (7), (21), (22), (23), (24), (25), and (26) are all derived from the root *korij* 'dry'.

Van Valin (2005:47) has argued that the relationship between activity verbs and active accomplishments can be derived by lexical rules, and has suggested that other verb classes might also be derived by lexical rule. In a morpheme-based theory, changes in verb classes are described as a combination of a base with a derivational morpheme which expresses the meaning of the derived class. In a process-based approach like the one described here, changes in verb classes are explained in terms of changes in features. In the realizational approach to morphology described in this paper, verb class is a key morphosyntactic feature of inflectional rules (cf. Table 7).²⁶ The fundamental insight of processual approaches to morphology is that morphology is a set of relationships rather than a set of morphemes.

In a morpheme-based approach, morphological rules/operations are defined in terms of morphemes. In a realizational approach, morphological rules/operations are defined in terms of features. From either perspective, the morphological operations involved in verb class changes are lexical; i.e., they occur in the lexicon. Furthermore, in both approaches, information about verb classes is available in the logical structure of verbs and semantic representations of clauses.

The analysis of realis and irrealis modality in §6 and §8 provides evidence that a realizational approach is superior to a morpheme-based approach. In a morpheme-based approach, one would expect to inflect an invariant stem with realis modality [**Mod**:RLS] or irrealis modality [**Mod**:IRR]. However, undergoer voice [**Voice**:UV] induced state of affairs [**Vclass**:ISA] do not share an invariant stem. As shown in (32) and (33), *-on* is a cumulative exponent of the features [**Vclass**:ISA], [**Voice**:UV], and [**Mod**:IRR], while the infix <ɿ> is a cumulative exponent of the features [**Vclass**:ISA], [**Voice**:UV], and [**Mod**:RLS]. Verb class is a lexical category, modality is an inflectional category, and the choice of voice takes place during the linking from semantics to syntax. In other words, different morphosyntactic features can be added throughout the linking process.

Work by Marial Usón, Faber, and Guest on a semantic metalanguage for RRG is compatible with a realizational approach to morphology (e.g., Marial Usón & Faber (2005),

²⁵ Being a lexicalist theory, traditionally RRG has not made an issue of the inflectional versus derivational distinction. Instead, RRG has presumed some version of the Lexicalist Hypothesis in which inflectional affixes are accounted for in the lexicon and are not sensitive to syntax.

²⁶ RRG can inform Stump's theory of Paradigm-Function Morphology via careful attention paid to *Aktionsart* classes in RRG.

and Marial Usón & Guest (2005)), as is Nolan's work on a feature-based computational lexicon for RRG (e.g., Nolan 2004).²⁷

This paper has taken a conservative approach to morpheme eradication by not trying to expunge all morphemes from the lexicon. I have simply argued that neither fully inflected words nor inflectional affixes should be included in an RRG lexicon.²⁸

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²⁷ Nolan's lexicon includes both lexemes and affixes. Although his feature system accounts for the operator projection suggesting inflectional affixes, it appears to be compatible with a realizational approach to morphology.

²⁸ In his argument for a realizational approach to morphology in RRG, Martín Arista (2008:122) claims that derivational affixes occur in the lexicon.

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TOWARDS A RECONSIDERATION OF CONSTRUCTIONAL SCHEMAS IN RRG: ARE ALL CONSTRUCTIONS DRIVEN BY “CONSTRUCTIONS”?¹

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Abstract

Constructional Schemas are a very important part of the RRG approach to the syntax-semantics-interface. They are suggested in order to capture the constructional knowledge that is available to speakers. However, Constructional Schemas are claimed to be relevant for the linking only in cases where “idiosyncratic, language-specific features of constructions” (Van Valin 2005:132) have to be considered in the linking. It is assumed that generally, the argument structure of a construction follows from the logical structure of a verb. The semantics of the verb should therefore be the main contributor of argument positions in an argument structure construction. Thus, RRG proposes constructional schemas for passive, antipassive and applicative constructions, but not for intransitive, transitive and ditransitive constructions, for example.

The paper will argue that the Constructional Schema is a valuable resource that can allow RRG to account for cases of language productivity, where mismatches between the valence of the verb and the argument structure of the construction occur. Thus, it is proposed to use Constructional Schemas from RRG as descriptive tools for constructions in general, which includes argument structure constructions as well. Following Jackendoff (2002), it is argued that constructions are learnable items with varying degrees of formal and semantic variability, which is gradually acquired with the construction. It will be demonstrated that Constructional Schemas provide a useful format for the description of the relevant characteristics of a construction and its role in the semantics-to-syntax linking. In this respect, Constructional Schemas are utilised to allow for the description of productivity and novelty in language use.

KEYWORDS: CONSTRUCTION GRAMMAR, ARGUMENT STRUCTURE, CONSTRUCTIONAL SCHEMAS, GERMAN

1 Introduction: Argument realization in RRG

Lexical theories of argument realization generally seek to explain the syntax of sentences on the basis of the meaning of the verb. There has to be a “mapping” of the lexical-semantic properties of the verb with the syntax of argument structure. It is posited that certain aspects of the verb meaning determine the number and the grammatical status of the arguments that will appear in a linguistic construction. Thus, verbs are classified according to the semantic features which in effect constitute the argument structure realization. Broadly, the following semantic factors are at issue: Causal notions, aspectual notions, event complexity and factors like sentience and volitionality (Levin and Rappaport Hovav 2005:128) These are considered to be „grammatically relevant facets of meaning“ (Levin and Rappaport Hovav 2005:9) of the verb.

¹ I would like to thank Rolf Kailuweit, Brian Nolan and Anja Voeste for valuable comments and discussion. Any errors are mine.

The first step in the mapping is to decompose the relevant verb meanings. In Role and Reference Grammar, the verb meanings are decomposed with respect to a combination of „causal“ and „aspectual“ features. The aspectual features are assigned on the basis of the Aktionsarten-classification carried out by Vendler (1967), according to which features like telicity, punctuality, stativity and dynamicity are distinguished. The basic semantic predicates are connected by the use of operators like CAUSE, BECOME and **do**'.

RRG distinguishes six classes, all of which have additional causative counterparts. The assignment of verbs to the classes is to be done by tests which are denominated “independent criteria” (Van Valin 2005:59), while it is admitted that some of the tests are either language-specific, do not apply in certain circumstances, or are misleading if different readings of verbs are involved. These tests are supposed to be the basis of the RRG approach to argument realization and syntactic organization.²

Verb class	Logical Structure
State	predicate' (x) or (x, y)
Activity	do' (x, [predicate' (x) or (x, y)])
Achievement	INGR predicate' (x) or (x, y)
Semelfactive	SEML predicate' (x) or (x, y) SEML do' (x, [predicate' (x) or (x, y)])
Accomplishment	BECOME predicate' (x) or (x, y) BECOME do' (x, [predicate' (x) or (x, y)])
Active Accomplishment	do' (x, [predicate ₁ '(x, (y))]) & INGR predicate ₂ '(z, x) or (y)
Causative	α CAUSE β ; α and β are logical structures of any type.

Table 1: Lexical representation for *Aktionsart* classes (Table 2.3 in Van Valin 2005:45)

In many other theories of argument realization, a case frame (Fillmore 1968) or a theta-role-list (generative approaches) is associated with a verb in its lexical entry. These lists determine the thematic relation that the verb will be associated with. In RRG, however, thematic relations are not supposed to play a paramount role.

“It is important to emphasize that in the system presented here, thematic relations play no direct role in lexical representation; the relevant semantic properties of the verbs are expressed by the decompositional logical structure representations, not by thematic relations. Thus even though a large number of role labels like agent, cognizer, theme and patient have been used in this discussion, they are merely mnemonics for argument positions in logical structure. They have no independent status.” (Van Valin 2005:60).

² Abbreviations are as follows: ACC: accusative, ASP: aspect, AUX: auxiliary, COMP: comparative degree, DAT: dative, DEC: declarative, DEF: definite, DEIC: deictic, DEM: demonstrative, F: feminine, GEN: genitive, IF: Illocutionary Force, INDEF: indefinite, INF: infinitive, INGR: ingressive, IMP: imperative, LOC: locative, M: masculine, MOD: modality, N: neuter, NEG: negative, NOM: nominative, NUC: nucleus, NUM: number, PART: particle, PAST: past (tense), PERF: perfect, pl: plural, POCS: Postcore Slot, POSS: possessive, PP: prepositional phrase, PRCS: Precore Slot, PRED: predicate, PRES: present (tense), PROP: proper, PSTP: past participle, PURP: purposive, REFL: reflexive, RP: Referential Phrase, sg: singular, SUBJ: Subjunctive, TNS: tense

The thematic relations are defined according to the argument positions in the decomposed logical structure representation (after Jackendoff 1976). Thus, the argument positions are given for each verb separately. At a later stage in the semantics-to-syntax-linking, these verb specific roles are generalized to Semantic Macroroles.

The paper will proceed as follows: In the following section, some more basic assumptions of lexical theories in general and RRG in particular will be discussed. It will be argued that the generalizations that are part of every theory of lexical decomposition, like the logical structures and the Generalized Semantic Roles, may not fully account for the general idea of the semantic motivation of argument structure constructions. Furthermore, the verb-centered algorithm of linking would have difficulties explaining valence-construction mismatches which occur in everyday language. In section 4, the usability of a “construction”-based account, as the one pursued in “Construction Grammar”, will be evaluated. It will be argued that the notion of a strong “form/function”-correlation, as suggested in many theories of Construction Grammar, would have to be replaced by an account that allows some variability in the architecture of linguistic constructions, such that it would be able to describe combinations of fixed constituents and free variables, as suggested by Jackendoff (2002), and also some vagueness and flexibility in the construction’s semantics. The fifth section will introduce a linking algorithm for argument structure constructions in German, where the main influence on the argument structure is not seen in the verb semantics, but in the requirements of the *construction*, as expressed in Constructional Schemas for intransitive, transitive and ditransitive constructions. It will be argued that the Constructional Schema, that is traditionally used in RRG for specialised, language-specific constructions, is a very useful and underestimated tool for the description of argument structure constructions, in particular in those cases where the construction would not be predictable by the semantics of the verb.

2 Mapping basic logical structures and possible thematic relations in RRG

The thematic relations continuum (Fig. 2.3 in Van Valin 2005:58) lists the thematic relations that are possibly placed in the logical structure argument positions of the basic predicates. Agent and patient are presented as the endpoints of the continuum.

As thematic relations are posited according to logical structure positions of single verbs, it may seem that there are a lot of thematic relations. In fact, there are only five “relevant distinctions”. These are the distinctions that fall out of the five possible argument positions in the logical structures of “activity” and “state” predicates, which are assumed to be basic. “Agent” is added as one of the thematic relations. It is ascribed only to verbs that lexicalize agency; for example *murder* as opposed to *kill*. DO signals agency in the logical structure.

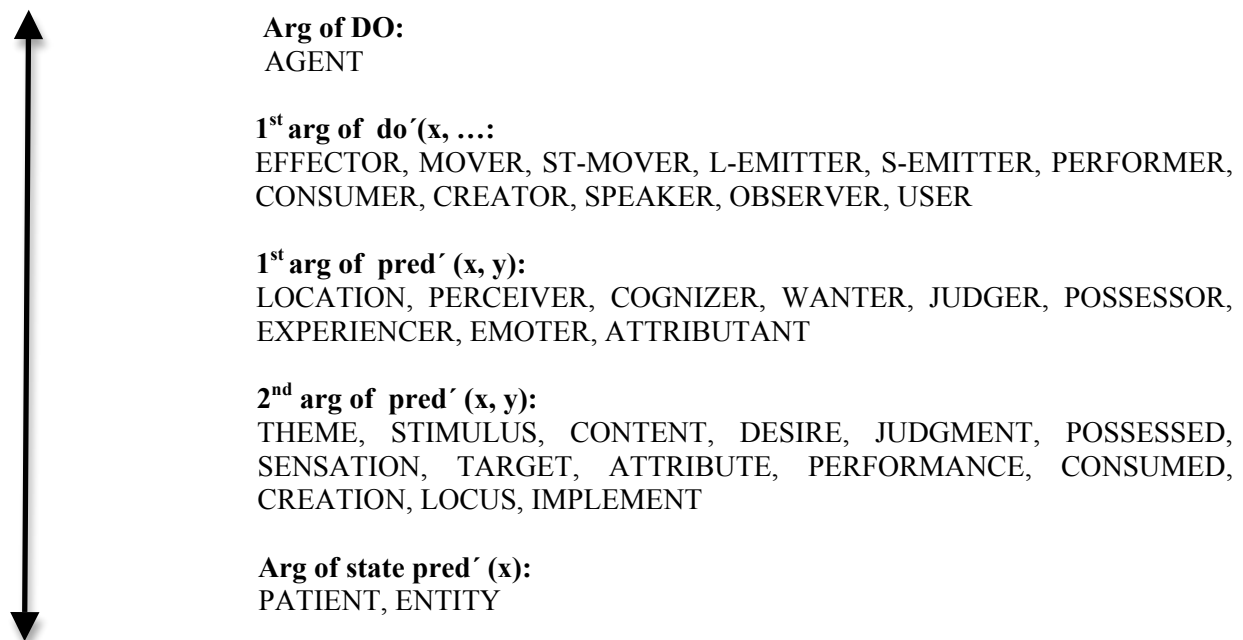


Fig. 1: Thematic relations continuum in terms of logical structure argument positions; after Van Valin (2005:58; Fig. 2.3)

Patient is listed as the single argument of a state predicate. It would be the argument of predicates like *crushed*, *killed* and *smashed*. The single argument of a state predicate, then, is something that displays the result of an action. The action that would be required to lead to this result is not listed, as it is not a basic logical structure. There is thus a mismatch between the assumption of basic logical structures and possible thematic relations. The so-called patient argument of *pred'*(x) would never occur alone in an active construction, as the basic logical structure seems to imply. The second argument of a result-implying verb like *smash* occurs as y, not as x, cf.

- (1) logical structure of *smash* (Van Valin 2005: 66)
[*do'*(x, Ø)] CAUSE [BECOME [*smashed'*(y)]]

Also, neither of the verb classes in Table 1 requires an agentive DO-predicate in its logical structure, not even a complex active accomplishment structure as the one in (2) (after Van Valin 2005:47)

- (2) Carl ate the pizza.
do'(Carl, [*eat'*(Carl, pizza)]) & INGR *consumed'*(pizza)

Thus, neither AGENT nor PATIENT appear naturally (i. e. without stipulation) as parts of a simple logical structure. The question is why they are listed among the “relevant distinctions” with thematic relations here, while RECIPIENT is not.

3 The account of Macroroles

In RRG, two Macroroles, the two “Generalised Semantic Roles” are introduced. They are named “Actor” and “Undergoer”. By definition, Actor and Undergoer are “the two primary arguments in a transitive predication, either one of which can be the single argument of an intransitive verb” (Van Valin 2005:60).

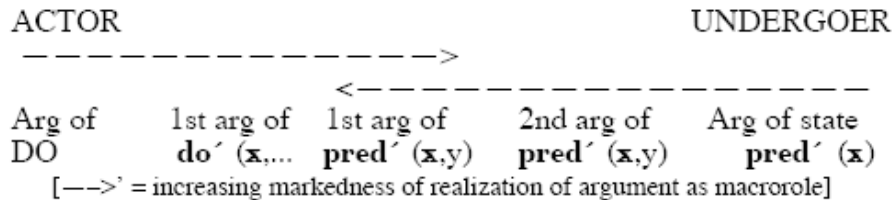


Fig. 2: The Actor-Undergoer-Hierarchy (after Van Valin 2005:61)

Actor and Undergoer are supposed to be based on the logical structure representations of verbs and their arguments. The Actor-Undergoer-Hierarchy determines the selection of the Macroroles Actor and Undergoer from the logical structure of a verb as follows:

“This double hierarchy says simply that given the logical structure of a transitive verb, the leftmost argument will be the actor and that the rightmost argument will be the undergoer.” (Van Valin 2005:61)

3.1 Generalised verb meanings and Macroroles: Some discussion

The concept of Macroroles resembles the concepts of “logical subject” and “logical object” semantically. The actor is the semantic counterpart of the traditional notion of “subject”, as it is the most agent-like argument. The undergoer is the semantic counterpart of the direct object. It is the most patient-like argument. While the traditional labels for grammatical relations, subject and object, are not used in RRG, the theory establishes the macroroles, which refer to semantic relations. Note that here with the description of Macroroles, the thematic relations lists come back into play, which have been rejected before, in favour of the logical structures. Macroroles are generalizations across thematic relations. Actor is the subject of active clauses, and Undergoer is the subject of passive clauses. Thus, the macroroles are not merely semantic; rather, they bridge the gap between semantic and grammatical relations.

„Macroroles are motivated by the fact that in grammatical constructions groups of thematic relations are treated alike.“ (Van Valin 2005: 60)

Macroroles can therefore be considered to constitute the link from semantics to syntax in the syntax/semantics interface.

This way of proceeding has the advantage that it is basically functional, as the arguments in a syntactic construction can be given a characterisation based on the semantics of the verb. Furthermore, it is applicable cross-linguistically, as in all languages the arguments in a transitive predication can be distinguished in terms of an „agent-like“ and a „patient-like“ argument. The traditional syntactically based subject vs. object distinction is not cross-linguistically applicable, as languages with an ergative syntax, for example, lack a „subject“ argument according to the traditional definition (Dixon 1994, Van Valin and LaPolla 1997, Diedrichsen 2006).

However, in the formulation of the mapping between semantics and syntax some generalizations are carried out, which call into question the semantic motivation of syntactic, i. e. argument structure facts.

1. The facets of meaning that are extracted from verb meanings are selected in virtue of their contribution to argument structure properties. Thus, the argument structure is decisive for the classification of verbs, not the verb semantics itself. The definition of argument structure properties “on the basis of verb classes” therefore becomes circular. Cf.:
“(…) advances in the understanding of argument realization regularities require isolating those semantic components which ultimately determine them.” (Levin and Rappaport Hovav 2005:16).
“In order to identify the grammatically relevant facets of verb meaning, it is crucial to recognize that verb meanings represent construals of events rather than the events themselves.” (Levin and Rappaport Hovav 2005:19).
2. The argument structure positions do not fall out of the semantics of the verb itself. The positions in the logical structure representation are the argument positions in transitive and intransitive constructions. In the Actor-Undergoer-hierarchy the logical structures are designed to form a continuum, whose endpoints are agent and patient, respectively.
3. The semantics-to-syntax linking is based on the requirements of the transitive construction. This becomes clear with Van Valin’s statement given above, where the basic definition of Actor and Undergoer does not give a semantic motivation, but rather the construction-based characterization that they are “the two primary arguments in a transitive predication” (Van Valin 2005:60).

Thus, the definition of the “Generalized semantic roles” and also the classification of verbs with respect to “grammatically relevant facets of meaning” are based on the features of argument structure constructions. The positions in the logical structures are argument structure positions. Accordingly, it is questionable whether a theory with an elaborated account of logical structures, that explicitly denies the theoretical importance of thematic relations (see above), would necessarily need the concept of Macroroles.

3.2 *Some arguments against the theoretical importance of “Macroroles”*

It has been pointed out above that the argument positions found in argument structure constructions are basically characterized with respect to the role they play in the constructions. The Generalized Semantic Roles are subject to a generalization that abstracts away from the particular verb meaning in a way that makes them applicable for the argument structure pattern that is found in a transitive construction. The postulation of two Macroroles instead of three makes it obvious that the basic constructional pattern is actually seen in the transitive, not in the ditransitive construction. This leads to problems with the assignment of a Macrorole to the third argument in a ditransitive construction (see Haspelmath 2008 and below for criticism).

If the construction were to be considered to be responsible for the argument realization, this could lead to the abandonment of the problematic concept of Macroroles. At least, these would not have to be considered to be basic elements of the theory. Abandoning the concept of Macroroles would be a considerable change to the theory’s principles, but, in my opinion, it would be adequate in the following respects:

- Many of the syntactic principles can be described without the help of macroroles. RRG is based on logical structures. Thematic relations are secondary, and thus the theoretical status of their generalization should not matter too much. Cf. the statement from Van Valin given in section 1.
- The definition of the Macroroles is based on argument positions in logical structures and their position with respect to each other. The correlation of argument positions and semantic relations is carried out on the basis of the thematic relations continuum. Thus, “1st arg and 2nd arg of” and “leftmost” and “rightmost” suffice to identify the arguments in the logical structure. The thematic relations continuum is necessary to give a semantic reference to the argument positions in the logical structure (see also Michaelis and Ruppenhofer 2001). The number of arguments and their syntactic realizations are provided by the construction. Macroroles are not necessary.
- The signification of argument hierarchies is to map the thematic relations with the syntactic relations that appear in a sentence. These syntactic relations, however, are defined as argument positions in monotransitive constructions.
- Recipients do not even appear in the AUH, even though they play a significant role in the syntax; for example, in recipient passives and secondative constructions (Diedrichsen 2008a, Haspelmath 2008). Still, the notion of a third macrorole is not accepted in RRG, cf. Van Valin (2004, 2005).
- Haspelmath (2008) shows that many syntactic processes like the omission of arguments can be described without referring to Macroroles.
- Nolan (this volume) shows that Machine translation Arabic-English on an RRG account works perfectly fine without Macroroles as well.

While Haspelmath (2008) suggests the postulation of four Macroroles for RRG, an extension of the idea of “Constructional Schemas” seems to me to be more promising, for the following reasons:

1. The constructional schemas are there already, they do not have to be introduced into the theory. What would be necessary, though, is to formulate constructional schemas for intransitive, transitive and ditransitive constructions.
2. With *constructions* as main contributors of argument structure, it would be possible to describe the PSA, for example, with respect to the construction.
3. The Macroroles have been one source for the identification of the PSA. With a constructional account, the Macroroles would be dispensable. As the previous discussion has shown, Macroroles are in deficit for many reasons. They don’t suffice to describe syntactic processes and phenomena, in particular with respect to ditransitive constructions.
4. It would be possible to treat constructions equally. Emerging constructions or spontaneous formations could be treated as constructions, not as mistakes or irregularities. This is especially important for the description of language change and variation. The fact that some constructions are more frequent than others would not be principally relevant for this description.

3.3 Mismatches with verb valence and argument structure

The discussion above involves theory-internal considerations that concern the definition and the prediction of the syntactic functions of argument positions with regular verbs. What about the following examples?

- (3) (Frankfurter Allgemeine Sonntagszeitung, national weekly news magazine, 11-9-2008)
 denn es sei ungerecht, dass Frau Ypsilanti
 as 3NsgNOM be.KONJ unfair that Mrs Y
 „gescheitert wurde“.
 fail.PSTP be.PAST3sg
 “It was supposed to be unfair that Mrs Y “was failed”.
- (4) <http://www.spiegel.de/netzwelt/web/0,1518,596618,00.html>, found 09.05.2009
 Was twittert mir Spiegel Online?
 whatNsgACC twitter.PRES3sg 1sgDAT SpiegelOnline (Name of the online magazine)
 What is Spiegel Online twittering (to) me?
- (5) (Common formulation among students at JLU Giessen):
Ich bin eingeflext.
 1sgNOM be.PRES1sg flex.inPSTP
 Lit.: I am flexed in.
 The past participle *eingeflext* means: registered in the online grading system **Flex-Now**
 I am registered in FlexNow.

In (3), a passive construction is used with the one-place verb *scheitern* (‘to fail’) in order to imply that the failure was not the responsibility of the person herself, but was probably caused by someone else. So, the first of these examples shows a construction that has more argument positions than the valence of the verb would predict. In the next two examples, there isn’t even a valence that speakers could resort to in order to pick the “correct” construction – the verb in (4) is a loan word (*twittern*), that is used in German only in connection with the on-line-service *Twitter*. It is used with a ditransitive construction here, as it could be used with other expressions of communication, like *erzählen* (‘tell’), *(Brief) schreiben* (‘write (letter)’), *e-mailen* (‘e-mail’), *faxen* (‘fax’) as well.

With (5), the situation gets even more complicated, as here, the form + meaning of the verb is an invention based on the name of the grading system. Thus, there is neither a valence nor an analogy of usage that speakers could resort to. Still, they create this new use and perpetuate it at least among a group of speakers. Furthermore, they have no problems at all using the new verb in an intransitive state passive construction: *Flex* is used as a verb stem, and the appropriate past participle form of it is formed with the regular German participle affixes *ge-* and *-t*.

The lexical approach to argument structure would have problems explaining the productive use of constructions, for example with loan and novel verbs, but also with well-known verbs used in unusual constructions. As such examples are no exceptions, neither are they generally considered to be ungrammatical, and as they are a common part of the spontaneous and creative use of everyday language, the lexical approach seems to posit a too stative and restricted idea of the interplay between verb and construction.

It seems also that the combination of constructions is language-specific. So, Pennsylvania German allows a combination of the *bekommen*-passive with the *am*-progressive construction, while Standard German does not.³ Note that this is merely a matter of constructions, not of the semantics of the verb.

(6) (Louden 2006):

Er	is	sei	Septic Tank	an
3MsgNOM	be.PRES3sg	POSS3MsgACC	Septic Tank	PREP

ausgebutzt	griege	heit.
clean.out.PSTP	get/receive.INF	today

He is getting his Septic Tank cleaned out today.

(7) ?? Er ist heute sein Auto

3MsgNOM	be.PRES3sg	today	POSS3MsgACC	car.sg
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am	gewaschen	kriegen.
PREP	wash.PSTP	get.INF

He is getting his car washed today.

4 On constructions

In constructionist approaches, it is assumed that both the lexical semantics of the verb and the “construction” contribute to the actual argument structure expressed in a sentence. While the lexicon contributes a rich verb meaning with a “minimal valence” (Goldberg 1995, Michaelis and Ruppenhofer 2001, Fillmore and Kay 1997), the “linking construction” is the force that forms the actual sentence with its argument positions.

The arguments in favour of constructionist approaches are manifold. As argued by Tomasello, human learning generally works according to gestalt perception, rather than according to rules of combining single entities to meaningful complexes. (cf. for example Tomasello 2006). The idea of constructions also makes sense with respect to the processing of syntactic structures. An incremental, „on-line“ analysis of a syntactic structure requires an early projection of the emerging structure. The predictability of the emerging structure is achieved by the storage of recurring structural patterns (Auer 2006). One important argument in favour of constructions is the observation that idiomatic utterances like *Cry me a river* and *He sneezed the napkin off the table* (Goldberg 1995) exist, and that they are not exceptions, but very common in language use. These kinds of utterances are not decomposable into their parts. Their meaning cannot be explained with respect to the words that occur in the utterance. Construction Grammar describes these structures as having „sign value“, and calls them „Constructions“. A „construction“ is a ‚conventionalized pairing of form and function‘ (Goldberg 2006:3). As such, it should have meaning.

The attribution of function/meaning on the one hand and recoverable formal properties on the other hand may turn out to be difficult for attested constructions, as will be outlined in the following section.

³ I thank Anja Voeste for pointing out this example to me.

4.1 Some descriptive problems of Construction Grammar

Goldberg (1995:31ff.) demonstrates the idea of a “construction meaning” by use of the English ditransitive construction. She suggests that there is a basic constructional meaning, but, as a linguistic sign, the construction is polysemous, such that various related senses would have to be described. For English, six classes of senses of the ditransitive construction are distinguished (1995:38). According to this approach, ‘transfer’ is the basic meaning that can be associated with every use of the ditransitive construction, and the others are „extensions“ of this central sense.

Goldberg’s classes of ditransitive constructions were applied to a collection of German recipient passive constructions that I collected from various sources throughout the years 2005-2007. The recipient passive is generally considered to be a „passive version“ of the ditransitive construction (Eisenberg 2006, Diedrichsen 2008a, Lenz to appear), and thus it should be semantically equivalent with the ditransitive construction (see Diedrichsen to appear for details and results of the study).

Some of the attested occurrences of the German recipient passive do not confirm the notion of transfer with the passive ditransitive structure, even if transfer is understood in a metaphorical sense. Also, there is no guarantee for this set of classes to be exhaustive. Consider the following example:

- (8) *er* *bekommt* *diese* *Aktion* *aber*
 3MsgNOM get/receive.PRES3sg DEMFsgACC action.sgACC but(PART)
- abgepfiffen*, *weil ...*
 blow-the-whistle-to-stop.PSTP because
 DFB-Semifinal Schalke 04 vs. Werder Bremen, ARD, 19.4.05
 (He gets/receives this action stopped (by the referee’s whistle), because ...)

In this construction, the two-place verb *abgepfiffen* is used in a ditransitive passive construction. It thus represents a case for a constructional approach, as it displays a valence-construction-mismatch. What about the construction’s semantics? It seems that the event expressed by the construction can only be captured in its entire complexity when the context with the involved participants is included in the description. In the context of the rules of a football game and of this particular situation, the past participle of the two-place verb, “abgepfiffen”, means that the referee, who has the authority to do this, blows the whistle in order to interrupt the action of a player. The player appears as the subject of the recipient passive construction. He is presented as the malefactive of the “whistling-to-stop-action” event, as it means (and the audience of the football-show know this) that he cannot go on with what he was doing and the other team will have the advantage. It is very hard to construct a sense of “transfer” here. The past participle could be claimed to express a reaction the subject gets from the implicit agent of the past participle. The meaning is more complex than just transfer of information here, however: The subject does not only receive an information, but is also the malefactive of this particular event, as he is not only informed, but also deterred from his action, and punished accessorially.

Thus, it would be very difficult to formulate a category of meaning for this example. Furthermore, it shows that the notion of “transfer” would be too narrow to describe the meaning of the ditransitive construction. This is observed by Barðdal (2007) as well. She identifies 17 classes of verbs that can occur in a ditransitive construction in Icelandic. She emphasizes that

not all of those verb meanings can be associated with the notion of transfer (Barðdal 2007:11).

I conclude that the set of semantic classes for constructions should not be considered to be fixed. The semantic extension that occurs with the development of a construction is obviously very flexible with respect to variations of meanings and situations of use.

It seems that despite the intuitive appeal of positing a form/function correlation for constructions, this approach leads to new problems, as neither the function, nor the form of a “construction” is fully predictable. Moreover, as for the function/meaning part, there is hardly any specification as to what exactly is to be described here.

There is an obvious antagonism between the supposed memorability of form-/function complexes on the one hand, and their variability on the other hand. How is this to be resolved?

4.2 Variability and learnability – constructions as conventions

According to Jackendoff (2002), there is generally some gradience in the memorability of linguistic units, be they single words or large portions of text like in *Hamlet*, for example (Jackendoff 2002:152f.) The extent to which a string of linguistic units can be memorized and recalled cannot be predicted, and thus, idioms in individual languages have varying complexity. Also, the extent to which parts of utterances are either stored or constructed online is not altogether predictable. Furthermore, the productivity of idiomatic constructions varies. For example, in English, there are expressions with semiproductive derivational morphology like denominal verbs. Not every noun has a corresponding denominal verb, and if it has one, the meaning is not predictable.

(9) (examples after Jackendoff 2002:158f.)

- a) **butter** a toast = put butter **on** a toast
- b) ***mustard** the sandwich = put mustard on the sandwich
- c) **shelve** the books = put the books **on the shelf**
- d) ***table** the books = put the books on the table

In these examples, both the ‘put N on’ and the ‘put on N’ meanings are available, but not with every noun! Also, with many of the denominal verbs, the ‘put sth in/on something’ interpretation is not enough to understand the meaning of the expression. To put one single book or a clock on the shelf would not mean *to shelve it*, and to put wine into a bottle would not suffice to bring about the state of affairs that is expressed in *bottle the wine* (Jackendoff 2002:158f.).

There are, however, constructions in English which allow a “combination of specified constituents and free variables” (Jackendoff 2002:175). Jackendoff gives examples of the *one’s head off* construction and the *way* construction, where some of the structural elements are fixed, while other elements are free variables.

(10) *read, swim, google, twitter, email one’s head off* = ‘do action to excess’ (after Jackendoff 2002:173; some examples mine, ED)

(11) *swim your way to glory, drinks his way through the evening, homer their way into the hearts of America, google my way to wisdom* = ‘traverse the path PP while/by doing V’ (cf. Jackendoff 2002:174, Goldberg 1995; some examples mine, ED)

The resultative construction even provides only the structure, which can be filled by free variables altogether. In these cases, the arguments are selected not by the verbs, but by the constructions (Jackendoff 2002: section 6.6). These examples show that “constructional idioms”

have different degrees of variability. The slots for the variable elements are fixed in the structure and thus learnable.

“(...) when a pattern with a variable develops, the relation among the stored items “goes productive”: the pattern can participate in free combination with other lexical items that satisfy its typed variables, and new combinations need no longer be stored.” (Jackendoff 2002: 189)

Regular patterns require a learning process that is comparable with the traditional conception of learning a rule. It accords the acquisition of a linguistic convention that takes place when a speaker is exposed to the use of the particular pattern in a language community. The variables are then learned from “instances” of the occurrence of the construction (*ibid.*), and the great variety of meanings and possibilities to fill the variables develop slowly in the course of the emergence of the construction (Jackendoff 2002:190, after Tomasello 2000).

5 Constructional Schemas

If the construction is not seen as a solid form/function unit, but rather as a learnable pattern with a learnable variety of variables, the productivity and emergence of structures can be explained (see Jackendoff 2002:180 for a similar argument). This approach is interesting for argument structure constructions as well, as here, the argument structure can be regarded as a productive structure, and the variables are the argument structure positions.

RRG recognizes the importance of constructions by positing constructional schemas, but only for the “idiosyncratic, language-specific features of constructions” (Van Valin 2005: 132). Thus, there are constructional schemas for passives, antipassives, conjunction reduction and *wh*-questions. These schemas are considered to be stored and applied in cases where the construction is not a direct consequence of the valence of the verb and the general argument realization principles applied in RRG. Accordingly, there are no constructional schemas for intransitive, transitive and ditransitive constructions.

The general idea of a Constructional Schema is that it informs about the features of a construction and thus reflects the knowledge that is stored with respect to a conventionalized construction in a language community. It includes syntactic, semantic and pragmatic properties of a construction. My suggestion is to use the Constructional Schema as a general descriptive tool for constructions. It contains explicit information about the fixed structural elements that would help the speaker/hearer recover the construction in the online production of utterances. As speakers also know about the productivity and variability of constructions by convention, the Constructional Schema has to inform about variable elements of the construction as well.

Obvious advantages of such an extension of the theoretical impact of constructional schemas include a new compatibility of RRG for the description of syntactic change and variation. This approach thus facilitates the description of grammaticalization phenomena in RRG. The entire issue of spontaneity, change, novelty, and variation that has been missing in previous approaches to RRG, can be fitted easily into the theoretical framework without changing its major properties.

5.1 *The new role of Constructional Schemas in the linking*

In this section, it will be demonstrated how a semantics-to-syntax linking for German sentences can be carried out by adding the benefits of a “constructional” perspective to Constructional Schemas, as discussed above, to the steps of the linking as suggested by, e. g., Van Valin (2005). One important aspect of this procedure is the decision as to the place the Constructional Schema will occupy in the linking. It has been shown for coordination and conjunction reduction (see Diedrichsen 2009:163 ff.), that the constructional schema has to be the first position in the linking. It will be argued below that this holds for argument structure constructions as well.

I will concentrate on the steps of the semantics-to-syntax-linking that are of interest with regard to argument realization. Some constructional schemas for intransitive, transitive and ditransitive constructions will be introduced, and it will be shown how they should be integrated into the description of the semantics-to-syntax-linking.

For the application of further details of the RRG-based semantics-to-syntax-linking, I refer the reader to Van Valin (2005), Van Valin and Diedrichsen (2006) and Diedrichsen (2009).

The Macrorole assignment principles, the Case assignment rules, the PSA selection principle and verbal agreement can be neglected, as all of this is ruled by the construction. There would however, have to be some statement about the cases that are distinguished in a language and the distribution of overt vs. non-overt case marking. I leave this out here as well; see Van Valin and Diedrichsen (2006) and Diedrichsen (2009).

In the following, I will suggest constructional schemas for German intransitive, transitive and ditransitive constructions in turn. Note that the RRG-concept of syntactic templates with core slots is available, so the argument positions are to be understood as argument positions in the syntactic template, which involves a core, a periphery and a precore slot. They do not have to be derived from the semantics of the verb or the construction. The “semantics of the construction” (e. g. Goldberg 1995, Michaelis and Ruppenhofer 2001, Barðdal 2007), if there is one, will be described in the “semantics” section of the Constructional Schema.

All of the constructional schemas will be provided with examples for convenience.

I. The German intransitive construction

- (12) Georg hat geschlafen.
G have.PRES3sg sleep.PSTP
Georg has slept.

- (13) Die Wäsche ist getrocknet.
DETFsgNOM laundry be.PRES3sg dry.PSTP
The laundry has dried.

Table 2: Constructional Schema for German intransitive construction

CONSTRUCTION: German intransitive construction
SYNTAX: Template: 1 core argument; x; appears in the PrCS in V2-structures (cf. Diedrichsen 2008b) PSA ['subject']: The argument is subject by default Linking: The argument is nominative by default
MORPHOLOGY: Auxiliary in the perfect: haben (,have') or sein (,be'), depending on semantic features (telicity) (cf. Diedrichsen 2002)
SEMANTICS: PSA can be any thematic relation
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions

II. The German transitive construction

- (14) David hat das Auto gewaschen.
 D have.PRES3sg DETNsgACC car.sg wash.PSTP
 David has washed the car.

Table 3: Constructional Schema for German transitive construction

CONSTRUCTION: German transitive construction
SYNTAX: Template: 2 core arguments; x, y; one appears in the PrCS in V2-structures PSA ['subject']: Highest ranking argument (default) Linking: Highest-ranking argument („agent“) will be nominative, lowest-ranking argument (patient) will be accusative (default)
MORPHOLOGY: RPs: Case marking subject to noun type and declension class Auxiliary in the perfect: <i>haben</i> (default), sometimes <i>sein</i> with verbs of motion in a transitive use
SEMANTICS: PSA is instigator of state of affairs (default), other core argument is affected or effected (there may be deviations)
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions; PSA = topic (default)

III. The German ditransitive construction

- (15) Meine Eltern haben mir diesen
 My.plNOM parents havePRES3pl 1sgDAT DEMMsgACC
 Computer geschenkt
 Computer give.PSTP
 My parents gave me this computer.

Table 4: Constructional schema for German ditransitive construction

CONSTRUCTION: German ditransitive construction
SYNTAX: Template: 3 core arguments; x, y, z; one appears in the PrCS in V2-structures; one may appear in the Periphery (see below) PSA [‘subject’]: Highest ranking argument Linking: Highest-ranking argument („agent“) will be nominative, lowest-ranking argument (patient/theme) will be accusative (default), second-highest ranking argument will be dative or in peripheral PP
MORPHOLOGY: RPs: Case marking subject to noun type and declension class Auxiliary in the perfect: <i>haben</i>
SEMANTICS: PSA is instigator of state of affairs (default), lowest-ranking core argument is affected or effected; third argument is recipient, benefactive or malefactive
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions; PSA = topic (default)

5.2 Linking semantics to syntax

The linking from semantics to syntax involves five steps in the original version (e.g. Van Valin 2005:129 ff.). It is a linking process from the semantic representation, which is the logical structure, of the verb, to the syntactic representation of the full sentence, where all of the syntactic features, like PSA selection, agreement, case marking, syntactic structure and word order are accounted for. Many of the steps in the linking process are considered to be universal, while the steps that involve syntactic features of a particular language, like case marking, are taken to be language-specific.

In the semantics-to-syntax-linking presented here, many of the steps involve the reference to a language-particular constructional schema. The benefit of this is, as argued before, that the system is able to account for varieties of uses of verb meanings, which is a considerable part of linguistic interaction and should not be neglected by a syntactic theory.

While in the original version the arguments were assumed to be selected by the verb, it is now assumed that the *construction* selects the arguments. This also means that the constructional schema is the first position in any semantics-to-syntax-linking. It determines the semantic representation and also the selection of the template(s).

Modified versions of the Completeness Constraint and the Core syntactic template selection principle are given below:

(16) Completeness Constraint:

All of the arguments explicitly specified in the semantic representation of a sentence, **as determined by the construction**, must be realized syntactically in the sentence, and all of the referring expressions in the syntactic representation of a sentence must be linked to an argument position in a logical structure in the semantic representation of the sentence.

(17) Core template selection principles

- a. Core syntactic template selection principle:
The number of syntactic slots for arguments within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.
- b. Construction-based specifications:
The number of distinct specified argument positions in the semantic representation of the core will be determined by the construction.

Note here that in b., the language-specific qualifications are replaced by “construction-based specifications”. The particulars about the “minimum syntactic valence” and the fact that the passive reduces the number of core slots by one can be neglected, as these facts are all ruled by the construction.

In the following, I will give semantics-to-syntax linkings for four examples.

The first example is the simple transitive construction in (14).

(14 rep.) David hat das Auto gewaschen.
 D have.PRES3sg DETNsgACC car.sg wash.PSTP
 David has washed the car.

Table 3 (rep.): Constructional Schema for German transitive construction

CONSTRUCTION: German transitive construction
SYNTAX: Template: 2 core arguments: x, y; one appears in the PrCS in V2-structures PSA [‘subject’]: Highest ranking argument (default) Linking: Highest-ranking argument („agent“) will be nominative, lowest-ranking argument (patient) will be accusative (default)
MORPHOLOGY: RPs: Case marking subject to noun type and declension class Auxiliary in the perfect: <i>haben</i> (default), sometimes <i>sein</i> with verbs of motion in a transitive use
SEMANTICS: PSA is instigator of state of affairs (default), other core argument is affected or effected (there may be deviations)
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions; PSA = topic (default)

Semantics-to-syntax-linking for (14): David hat das Auto gewaschen.

Step 1.

- a. Construct the semantic representation of the sentence, based on the construction and the predicator.
do’ (x, [**wash’** (x, y)])
- b. Determine the value of the operators to be expressed. (For the sake of ease of presentation, this will not be carried out here).
- c. Select the referring expressions to fill the variable positions in LS, according to the activation statuses of the referents (for this procedure, see Diedrichsen 2009).
The following activation statuses are distinguished:

Active=ACV: actively under consideration in the discourse by means of direct mention.

Accessible=ACS: not actively under consideration, but readily recognized by the addressee due to world knowledge or occurrence in the situation.

Inactive=INA: previously mentioned but not actively under consideration, not assumed by the speaker to be recognized by the addressee.

Brand-new anchored=BNA: not previously mentioned but related to something already mentioned or accessible.

Brand-new unanchored=BNU: not previously mentioned or related to anything previously mentioned (Van Valin 2005:79 f., Prince 1981, Chafe 1987).

do' (David, [**wash'** (David_{ACS}, Auto_{ACS})])

(In step two, the determination of the actor and undergoer assignments is carried out in the original model. As it is argued here that the argument realization is determined by the construction, this step is obsolete here).

Step 2.

Determine the morphosyntactic coding of the arguments on the basis of the Constructional Schema.

- a. PSA: Highest ranking argument
- b. Highest-ranking argument („agent“) will be nominative, lowest-ranking argument (patient) will be accusative (default). The case marking is subject to RP type and declension class.
- c. Agreement marking: Finite verb agreement is always with the PSA.

Step 3.

Select the syntactic template(s) for the sentence, according to the general rules from Van Valin and Diedrichsen (2006) and Diedrichsen (2009). For the core template, follow the core template selection principles and the specifications in the Constructional Schema.

Step 4.

Assign LS elements to positions in the syntactic representation, according to the general word order rules for German from Van Valin and Diedrichsen (2006) and Diedrichsen (2008b). These will not be changed for the argument structure construction.

Semantics-to-syntax-linking for (4):

- (4) Was twittert mir Spiegel Online?
 whatNsg twitter.PRES3sg 1sgDAT SpiegelOnline (Name of the online magazine)
 What is Spiegel Online twittering (to) me?

Here, a Constructional Schema for a German W-question, which is the equivalent of WH-questions in English (cf. Van Valin 2005:133 for the respective Constructional Schema) is combined with a Constructional Schema for the German ditransitive construction.

Table 5: Constructional schema for German W-question

CONSTRUCTION: German W-question
SYNTAX: Template: 1-3 core arguments; the W-word appears in the PrCS in V2-structures (default) PSA ['subject']: may be any core argument
MORPHOLOGY: RPs: Case marking subject to noun type and declension class Auxiliary in the perfect: may be any auxiliary
SEMANTICS: Contains an open proposition with a variable α , W-RP= α
PRAGMATICS: Illocutionary force: interrogative Focus structure: narrow focus on W-RP (Default: PrCS)

Table 4 (rep.): Constructional schema for German ditransitive construction

CONSTRUCTION: German ditransitive construction
SYNTAX: Template: 3 core arguments; x, y, z; one appears in the PrCS in V2-structures; one may appear in the Periphery (see below) PSA ['subject']: Highest ranking argument Linking: Highest-ranking argument („agent“) will be nominative, lowest-ranking argument (patient/theme) will be accusative (default), second-highest ranking argument will be dative or in peripheral PP
MORPHOLOGY: RPs: Case marking subject to noun type and declension class Auxiliary in the perfect: <i>haben</i>
SEMANTICS: PSA is instigator of state of affairs (default), lowest-ranking core argument is affected or effected; third argument is recipient, benefactive or malefactive
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions; PSA = topic (default)

Semantics-to-syntax-linking for (4): Was twittert mir Spiegel Online?

Step 1. Combine the constructional schemas.

- Construct the semantic representation of the sentence, based on the construction and the predictor: **do'** (x, *twitter*) CAUSE BECOME [**know'** (y, z)]
- Determine the value of the operators to be expressed. (For the sake of ease of presentation, this will not be carried out here).
- Select the referring expressions to fill the variable positions in LS, according to the activation statuses of the referents
do' (Spiegel Online_{ACS}, *twitter*) CAUSE BECOME [**know'** (ich_{ACV}, was_{BNU})]

Step 2.

Determine the morphosyntactic coding of the arguments on the basis of the Constructional Schema for the ditransitive construction.

- a. PSA: Highest ranking argument
- b. Highest-ranking argument („agent“) will be nominative, lowest-ranking argument (patient) will be accusative (default), second-highest ranking argument will be dative. The case marking is subject to RP type and declension class.
- c. Agreement marking: Finite verb agreement is always with the PSA.

Step 3.

Select the syntactic template(s) for the sentence, according to the general rules from Van Valin and Diedrichsen (2006) and Diedrichsen (2009). For the core template, follow the core template selection principles and the specifications in the Constructional Schemas.

Step 4.

Assign LS elements to positions in the syntactic representation, according to the general word order rules for German from Van Valin and Diedrichsen (2006) and Diedrichsen (2008b), and the Constructional Schemas.

Semantics-to-Syntax-linking for (8):

- (8) (DFB-Semifinal Schalke 04 vs. Werder Bremen, ARD, 19.4.05)
- | | | | | |
|---|---------------------|-----------|-----------|-----------|
| er | bekommt | diese | Aktion | aber |
| 3MsgNOM | get/receive.PRES3sg | DEMFsgACC | action.sg | but(PART) |
| abgepfiffen, weil ... | | | | |
| blow-the-whistle.PSTP because | | | | |
| (He gets/receives this action stopped (by the referee's whistle), because ...) | | | | |

The construction is a recipient passive. It is a passive version of a ditransitive active structure, whose LS includes the base predicate CAUSE [BECOME **pred'**] as a three-place structure, which means that it takes three arguments, while one (the agent) can be unspecified.

Table 6: Constructional Schema for German recipient passive (cf. Diedrichsen 2008a)

CONSTRUCTION: German passive (recipient)
SYNTAX: Template: 3 core arguments; x, y, z; one appears in the PrCS in V2-structures; one may either appear in the Periphery or be omitted (see below) PSA [‘subject’]: Second-highest-ranking argument of a ditransitive structure Linking: Non-default; Second-highest ranking argument will be nominative; lowest-ranking argument (patient/theme) will be accusative (default), highest-ranking argument („agent“) omitted or in peripheral <i>von</i> -PP
MORPHOLOGY: RPs: Case marking subject to noun type and declension class Verb: past participle Auxiliary (nuclear): <i>bekommen, kriegen, erhalten</i> (latter more restricted than the other two)
SEMANTICS: PSA is not instigator of state of affairs but is recipient, benefactive or malefactive of it (default)
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions; PSA = topic (default)

Semantics-to-syntax-linking for (8): Er bekommt diese Aktion abgepfiffen

Step 1.

- Construct the semantic representation of the sentence, based on the construction and the predicator.
do' (x, blow-the-whistle) CAUSE BECOME [**stopped'** (y, z)]
Note that here, basing the semantic representation only on the predicator would not lead to this attested structure, as *blow-the-whistle-to-stop* in the sense expressed here is bivalent.
- Determine the value of the operators to be expressed. (For the sake of ease of presentation, this will not be carried out here).
- Select the referring expressions to fill the variable positions in LS, according to the activation statuses of the referents.
do' (x, blow-the-whistle) CAUSE BECOME [**stopped'** (er_{ACV}, diese Aktion_{ACV})]

Step 2.

Determine the morphosyntactic coding of the arguments on the basis of the Constructional Schema.

- PSA: Second-highest ranking argument
- Highest-ranking argument („agent“) omitted or in peripheral *von*-PP. Second-highest ranking argument will be nominative, lowest-ranking argument will be accusative. The case marking is subject to RP type and declension class.
- Agreement marking: Finite verb agreement is always with the PSA.

Step 3.

Select the syntactic template(s) for the sentence, according to the general rules from Van Valin and Diedrichsen (2006) and Diedrichsen (2009). For the core template, follow the core template selection principles and the specifications in the Constructional Schema.

Step 4.

Assign LS elements to positions in the syntactic representation, according to the general word order rules for German from Van Valin and Diedrichsen (2006) and Diedrichsen (2008b).

Semantics-to-Syntax-linking for (6):

(6) Er is sei Septic Tank an ausgebutzt
3MsgNOM be.PRES3sg POSS3sgM Septic Tank at clean.out.PSTP

griege heit.
get/receive.INF today
He is getting his Septic Tank cleaned out today.

In this example from Pennsylvania German, a combination of the *bekommen*-passive with the *am*-progressive construction occurs. Both constructions are well known and frequent in Standard German as well, but a combination of them would sound weird to a speaker of Standard German (see above). The possibility to combine those two constructions is thus not a matter of the semantics of the verb. Note that the preposition *am* occurs as *an* in Pennsylvania German, but this does not affect the description of the construction as a whole.

For this construction, it has to be assumed that the syntactic representation is built from two constructions. Their Constructional Schemas will be given in turn.

Table 7: Constructional Schema for German *am*-Progressive

CONSTRUCTION: German <i>am</i> -Progressive construction
SYNTAX: Template: 1-3 core arguments, one appears in the PrCS in V2-structures PSA ['subject']: The highest ranking argument is subject by default Linking: The highest ranking argument is nominative by default
MORPHOLOGY: RPs: Case marking subject to noun type and declension class General configuration: Auxiliary <i>sein</i> + preposition <i>am</i> + infinitive of any verb (but see semantic specifications below) <i>Am</i> occurs in the position in front of the nucleus. Auxiliary in the perfect: <i>sein</i> (,be')
SEMANTICS: Denotes ongoing processes, mostly activities or active accomplishments. PSA is the only argument in the sentence or is instigator of state of affairs. Hardly possible with non-duratives, in Standard German never heard with Passives.
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions

Table 6 (rep.): Constructional Schema for German recipient passive

CONSTRUCTION: German passive (recipient)
SYNTAX: Template: 3 core arguments; x, y, z; one appears in the PrCS in V2-structure; one may either appear in the Periphery or be omitted (see below) PSA [‘subject’]: Second-highest-ranking argument of a ditransitive structure Linking: Non-default; Second-highest ranking argument will be nominative; lowest-ranking Argument (patient/theme) will be accusative (default), highest-ranking argument („agent“) omitted or in peripheral <i>von</i> -PP
MORPHOLOGY: RPs: Case marking subject to noun type and declension class Verb: past participle Auxiliary (nuclear): <i>bekommen, kriegen, erhalten</i> (latter more restricted than the other two)
SEMANTICS: PSA is not instigator of state of affairs but is recipient, benefactive or malefactive of it (default)
PRAGMATICS: Illocutionary force: Unspecified Focus structure: No restrictions; PSA = topic (default)

Semantics-to syntax linking for (6): Er is sei Septic Tank an ausgebutzt griege heit.

Step 1.

Combine the Constructional Schemas.

- Construct the semantic representation of the sentence, based on the construction and the predicator.
do' (x, Ø) CAUSE BECOME [**cleaned'** (y, z)]
- Determine the value of the operators to be expressed. The preposition *am* (here: *an*) is an imperfective aspect marker in the *am*-progressive construction, thus it links to the operator projection as a nuclear operator (cf. the operator projection in figure 3).
- Select the referring expressions to fill the variable positions in LS, according to the activation statuses of the referents.
do' (x, Ø) CAUSE BECOME [**cleaned'** (er_{ACV}, sei Septic Tank_{INA})]

Step 2.

Determine the morphosyntactic coding of the arguments on the basis of the Constructional Schema for the recipient passive.

- PSA: Second-highest ranking argument
- Highest-ranking argument („agent“) omitted or in peripheral *von*-PP. Second-highest ranking argument will be nominative, lowest-ranking argument will be accusative. The case marking is subject to RP type and declension class.
- Agreement marking: Finite verb agreement is always with the PSA.

Step 3.

Select the syntactic template(s) for the sentence, according to the general rules from Van Valin and Diedrichsen (2006) and Diedrichsen (2009). For the core template, follow the core template selection principles and the specifications in the Constructional Schemas.

- a. As it is a declarative clause with an adjunct in the postcore slot, select the clause template with PrCS and PoCS (cf. Van Valin and Diedrichsen 2006).
- b. For embedded clauses, select the subordinate clause template: d.n.a.
- c. For the core template, follow the core template selection principles and the specifications in the Constructional Schemas. In a passive declarative, one of three core arguments occurs in the PrCS, one is omitted. One is left in the core. Thus, select a 1-place core.
- d. Select the nucleus template.
- e. For the RPs, select a pronoun template and a common noun template.
- f. Select a periphery template for the adjunct modifier.

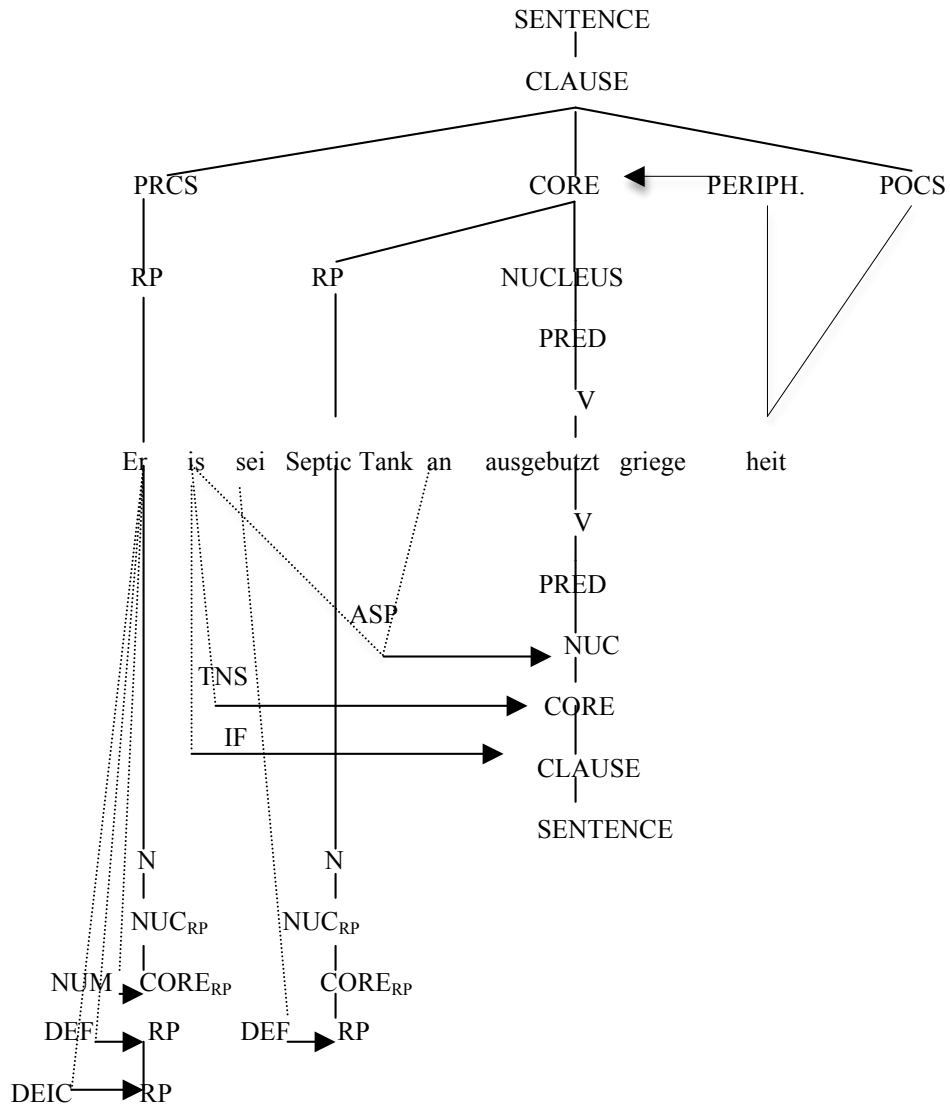
Step 4.

Assign LS elements to positions in the syntactic representation, according to the general word order rules for German from Van Valin and Diedrichsen (2006) and Diedrichsen (2008b). Take into account the design of the *am*-construction, where *am* (here: *an*) has to occur in front of the nucleus and the nucleus is never finite.

- a. Assign the predicate to the nucleus.
- b. Join the operator projection template to the nucleus and attach the morphemes expressing operators to it. The preposition *am* (here: *an*) expresses an aspect operator in this construction.
- c. Since the nucleus is non-finite, assign it to the last position in the core. Place the finite auxiliary before the first slot in the core.
- d. Link the argument in the nominative case *er* to the PrCS.
- e. Link the accusative argument to the remaining core position. Link the adjunct *heit* to the periphery and the PoCS.

Completeness Constraint satisfied.

Fig. 3: Structure with constituent and operator projections for (6).



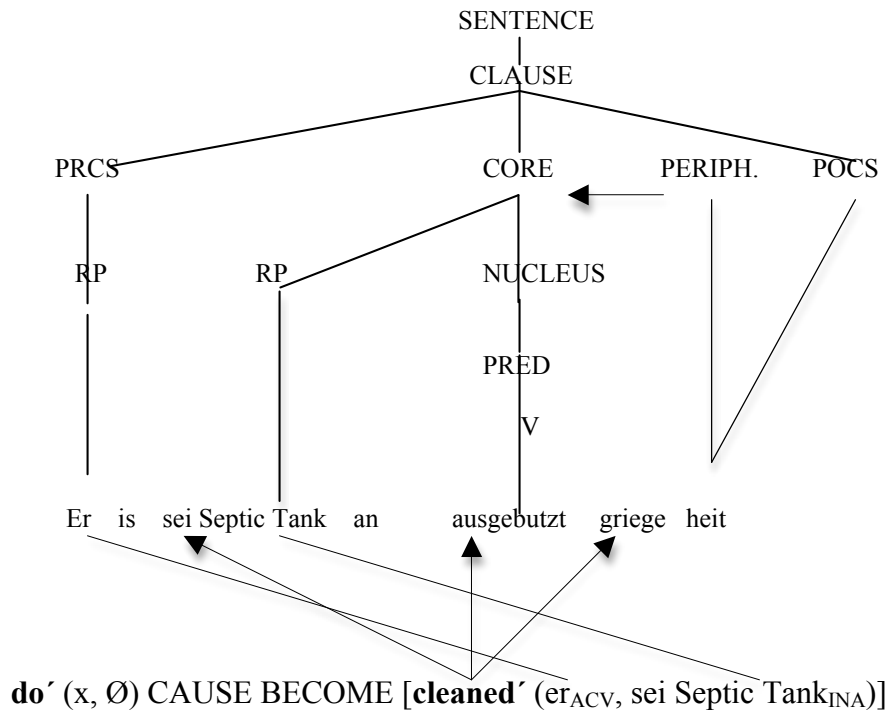


Fig. 4: Simplified linking from semantics to syntax for (6).

The arrows point to the three verbal elements of the combination of *am*-construction and recipient passive.

6 Conclusion

In this paper, some of the basic assumptions of RRG have been re-organized in order to account for a more flexible view of syntactic argument structure constructions. In particular, it has been argued that not a generalized notion of the semantics of the verb, in terms of „grammatically relevant facets of meaning“ should be considered to be the functional basis of argument structure constructions, but rather the „construction“ as *gestalt* that is stored and recovered in linguistic interaction. To this effect, it has been suggested to enhance the theoretical impact of the Constructional Schemas which are an important component of RRG-based linguistic descriptions anyway.

It is proposed to use Constructional Schemas from RRG as descriptive tools for all kinds of constructions. They are supposed to reflect interlocutors' knowledge of a construction. Thus, they can be filled with syntactic, semantic, and pragmatic information, but possibly also with other facets of knowledge that interact in the production and recovery of a construction in language use.

With this account, the syntax/semantics interface is built on constructions, while the concept of Macroroles has been found to be not sufficient for the description of many important phenomena, on the one hand, and gratuitous for the aims of the theory, on the other hand. The big advantage of a constructional account is seen in the possibility to describe structures with an unusual verb/construction combination. These are commonly found in everyday language, and they illustrate language creativity, spontaneity and variation. They can also be indicators of syntactic innovation in the sense of grammaticalization. For these reasons, they should not be ignored by a modern syntactic theory.

Following Jackendoff's (2002) approach, it is argued that the character of constructions as learnable items is to be taken seriously, but it has to allow for formal and semantic variability, which is not sufficiently considered in many Constructionist approaches that postulate a form/function correlation for constructions. The properties of the construction as given in a Constructional Schema are to be seen as based on conventions in language use. They are acquired as conventions, which happens gradually. Thus, it is possible that not every member of a linguistic community would know or accept all of the varieties of the construction. The constructions are extendable semantically, and it is also possible that the semantics generally associated with a construction gets replenished or overridden by the knowledge shared among the interlocutors or by the situation of use.

The paper has provided an illustration of the integration of Constructional Schemas for argument structure constructions into the semantics-to-syntax linking for a number of attested examples from Standard German and one example from Pennsylvania German.

It has been shown that it is possible to create an account of argument realization using a combination of the RRG apparatus and the idea of „constructions“ found in Construction Grammar. The RRG framework provides the basic elements, which are mainly the linking algorithm, the syntactic templates and the Constructional Schemas, but also the logical structures with the argument positions.

Further investigations on the RRG/constructions framework will be necessary to give a more detailed account of the principles behind the combinations of constructions. There has to be a thorough examination of the pragmatic factors behind the selection of constructions as well. As for the cross-linguistic aspects, a comparison of Constructional Schemas in different languages would be a very promising field of study.

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Se incompatible predicates in Spanish: a RRG explanation

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Abstract

This paper deals with the question of why some Spanish verb are incompatible with *se* in the “impersonal construction”: *llover*, *morir*, *haber*, *gustar*, among others. Based on the proposal that Spanish *se* is the manifestation of a lexical rule and a semantic phenomenon that privilege the undergoer argument (González Vergara, 2006, 2009), I propose that this behavior can be explained in a simple way in the RRG framework: none of these verbs (and similar ones) can privilege the undergoer either because they don't have macrorole arguments (*haber* type) or because their undergoer argument is already privileged (*morir*, *haber* and *gustar* type).

Keywords: Spanish *se* constructions.

1. Introduction

In Spanish, there are some verbal predicates that apparently are incompatible with the morpheme *se*, as we can see in (1).

- (1) a. *Se llueve
REFL rain.3sg
do' (rain')
- b. *Se murió
REFL die.PAST.3sg
INGR **dead'** (Ø)
- c. *Se hay nubes en el cielo
REFL there-is.3sg clouds in the sky
be-in' (cielo, nubes)
- d. *Se gusta el cine
REFL like.3sg the movies
like' (Ø, cine)

These are very different verbs. We have activities, as in (1a), states (1c and 1d), and achievements, as in (1b); some selects only one argument (1b), some two (1c and 1d), and one of them doesn't even select an argument at all (1a). If we look at these data, we can ask ourselves: What do these predicates have in common, and why are they incompatible with *se*? or, in other words, what is *se*? and why is this particle incompatible with those predicates?

I suggest that these data can be explained in a simple way within the framework of RRG, based on the properties of the Spanish morpheme *se*.

2. The nature of Spanish *se*

In González Vergara (2006, 2009), I propose that Spanish *se* is the morphological manifestation of a lexical phenomenon that modifies the logical structure of the sentence, diminishing the actor's importance and privileging the undergoer when it is present. In other words, this phenomenon intervenes in the logical structure with the purpose of not expressing syntactically the natural argument hierarchy. This proposal is strongly based on the work of Centineo (1995), Van Valin and LaPolla (1997) and Bentley (2004).

According to this idea, I proposed a set of lexical rules for predicates of all types of aktionsart, as can be seen in (2).

- (2) Given any kind of logical structure, unspecify the argument *x* of the predicate.
- a. States: **pred'** (*x*, *y*) \leftrightarrow **pred'** (\emptyset , *y*)
 - b. Activities: **do'** (*x*, [**pred'** (*x*, (*y*))]) \leftrightarrow **do'** (\emptyset , [**pred'** (\emptyset , (*y*))])
 - c. Active accomplishments:
 - c'. **do'** (*x*, [**pred1'** (*x*, *y*))]) & INGR **pred2'** (*y*) \leftrightarrow **do'** (\emptyset , [**pred1'** (\emptyset , *y*))]) & INGR **pred2'** (*y*)
 - c''. **do'** (*x*, [**pred'** (*x*))]) & INGR be-LOC' (*y*, *x*) \leftrightarrow **do'** (\emptyset , [**pred'** (\emptyset))]) & INGR be-LOC' (*y*, \emptyset)
 - d. Accomplishments and achievements: BECOME/INGR **pred'** (*x*, *y*) \leftrightarrow BECOME/INGR **pred'** (\emptyset , *y*)
 - e. Semelfactives:
 - e'. SEML **pred'** (*x*, *y*) \leftrightarrow SEML **pred'** (\emptyset , *y*)
 - e''. SEML **do'** (*x*, [**pred'** (*x*, (*y*))]) \leftrightarrow SEML **do'** (\emptyset , [**pred'** (\emptyset , (*y*))])
 - f. Causatives:
 - f'. [**do'** (*x*, \emptyset)] CAUSE [(BECOME/INGR) **pred'** (*y*)] \leftrightarrow [**do'** (\emptyset , \emptyset)] CAUSE [(BECOME/INGR) **pred'** (*y*)]
 - f''. [**do'** (*x*, \emptyset)] CAUSE [**do'** (*y*, [**pred'** (*y*))]) \leftrightarrow [**do'** (\emptyset , \emptyset)] CAUSE [**do'** (*y*, [**pred'** (*y*))])

I suggest that all the traditional Spanish non reflexive *se* sentences (passive reflexive sentences, impersonal reflexive sentences, interest *se* sentences, intrinsic *se* sentences and middle sentences) can be explained by the combination of these lexical rules with different morphological, semantic, syntactic and pragmatic properties, expressed in the form of constructions, that I named “non-PSA construction”, “undergoer PSA construction”, “middle construction” and “aspectual *se* construction”. In table 1 we can see the constructional schema for the Spanish middle sentence (based on Felú, 2008) and in figure 1, how the properties in this schema influence the linking in a sentence as *la camisa se ensucia fácilmente*.

[INSERT TABLE 1]

Table 1. *Constructional schema for Spanish middle sentences*

All these constructions, nevertheless, are based on the lexical phenomenon already described.

[INSERT FIGURE 1]

Figure 1. *Properties of the Spanish middle construction and their influence in the linking*

3. Some apparent exceptions

Let's return to our initial set of verbs. Apparently, some of them are compatible with the morpheme *se*, as we can see in (3):

- (3)
- a. El techo se llovió
the roof REFL rain.PAST.3sg
The roof was rained
 - b. Pedro se murió
Pedro REFL die.PAST.3sg
Pedro died
 - c. María se gusta
María REFL.like.PRES.3sg
María likes herself

Actually, these verbs are in fact compatible with *se*, but only when the sentence presents a privileged syntactic argument. (2a) and (2b) belongs to the *undergoer PSA construction* and (2c) is a reflexive sentence. Nevertheless, these predicates cannot be expressed with *se* in the *non-PSA construction*; in other words, they can only show *se* when their meaning is related to a PSA argument.

We can now refine our initial question, that can be reformulated as follows: Why do verbs as those listed in (1) and, in a more complete set, in (4) are not compatible with *se* in the non-PSA construction?

- (4)
- a. llover (to rain), nevar (to snow), garúar (to drizzle), temblar (to tremble)
 - b. morir (to die), aparecer (to appear), crecer (to grow), envejecer (to get old), adelgazar (to slim)
 - c. hay (there is)
 - d. alcanzar (to have enough), apenar (to cause sorrow), convenir (to suit), costar (to take effort), doler (to feel hurt), extrañar (to feel the lack), faltar (to lack),

gustar (to like), importar (to matter), interesar (to be interested), molestar (to be bothered), preocupar (to be worried), quedar (to have left), sobrar (to spare).

- e. dar pena/miedo/gusto (feel pity/fear/delight)

4. The proposal

If *se* is actually the morphological expression of a lexical phenomenon that privileges the undergoer argument, the incompatibility of the predicates in (3) can be explained easily. What all of them have in common is that their logical structures cannot privilege an undergoer argument, either because the undergoer is already the privileged argument or because their logical structures don't have arguments in the first place.

I propose four types of *se* incompatible verbs: *haber* type, *llover* type, *morir* type, and *gustar* type. Let's inspect in detail every kind of predicates.

4.1. The *llover* type

Verbs as *llover* (to rain), *nevar* (to snow) and *temblar* (to tremble (the earth)), usually known as *weather verbs*, are activities that lack any kind of arguments in their logical structures, as can be seen in (5).

- (5) Ayer llovió / nevó / tembló
 yesterday rain.PAST / snow.PAST / tremble.PAST
yesterday' (do' (rain'/snow'/tremble'))

As a consequence of its lack of arguments, these verbs don't have a privileged syntactic argument and the verb takes the defective form (third person singular). Therefore, there is not any argument that can take the undergoer macrorole and if there is not an undergoer argument, it cannot be privileged. Thus, these verbs are incompatible with *se*.

It has to be noted again that apparent exceptions as the ones in (6) are not really weather verbs, but predicates that have at least one semantic argument and a PSA, as can be noted by the agreement.

- (6) a. Las carpas se llovieron
 the tents REFL rain.PAST.3pl
 The tents were soaked in rain
 b. Los patios se nevaron
 the backyards REFL snow.PAST.3pl
 The backyards got covered in snow

In (7a) we can see an interesting case. At first, it seems to be a case of "temblar" that presents *se*, but does not show any argument. However, if we compare this sentence with (7b)

we can see that the verb in (7a) is not a weather verb, but one derived from a verb with PSA, as it can be inferred from the agreement. So, *se* appears here as a consequence of the application of the lexical rule in (2b).

- (7) a. Antiguamente, se temblaba de miedo con las películas de terror
Formerly, REFL tremble.PAST of fear with the films of horror
Formerly, one used to tremble out of fear with horror films
- b. Antiguamente, nosotros temblábamos de miedo con las películas de terror
Formerly, we tremble.PAST.1pl of fear with the films oh horror

4.2. The *morir* type

Verbs as *morir* (to die), *aparecer* (to appear), *crecer* (to grow), *envejecer* (to get old), or *adelgazar* (to slim) are all accomplishments, achievements or processes based on states logical structures that have only one argument.

Since the base predicate is a state, the only arguments in these verbs take the undergoer macrorrole, following the Default Macrorole Assignment Principles (Van Valin & LaPolla, 1997). Therefore, the argument selected as PSA is the undergoer. In this kind of verbs, thus, the lexical phenomenon of *se* cannot occur because the undergoer is already the privileged argument, as can be seen in (8).

- (8) a. *Se murió
INGR **dead'** (Ø)
- b. *Se creció
PROC **grown'** (Ø)
- c. *Se envejeció
PROC **old'** (Ø)
- d. *Se adelgazó
PROC **thin'** (Ø)

Again, verbs of the type we can see in (9) can show *se*, but are not part of the *non-PSA construction*. They do have a PSA, as we can see by the agreement. These verbs have idiosyncratic meanings also related to the lexical phenomenon, as it is proposed in González Vergara (2006).

- (9) a. Tus mascotas se murieron
your pets REFL die.PAST.3pl
Your pets died
- b. El equipo se creció
The team REFL grow.PAST.3sg

- The team grew stronger
- c. La actriz se envejeció
The actress REFL get-old.PAST.3sg
The actress got old
- d. El niño se adelgazó
The boy REFL slim.PAST.3sg
The boy slimmed

4.3. The *haber* type

Following the description of Fernández Soriano & Táboas (1999), *haber* is a state predicate that takes two arguments, one of them a locative. The locative argument, however, never appears as a central direct argument, but in a prepositional phrase. The second argument of this state predicate is always selected as PSA. Therefore, we can propose that, in terms of macroroles, this verb behaves as a state with only one argument and, thus, we stipulate this in the logical structure, as can be seen in (10).

- (10) Hay nubes en el cielo
be.PRES.3sg clouds in the sky
There are clouds in the sky
be-in' (sky, nubes) [MR1]

Since the “haber” logical structure is specified as [MR1] and it is a state, the argument takes the undergoer macrorole and it is selected as PSA. Once again, we can see that this logical structure is incompatible with *se* because the undergoer is already privileged.

4.4. The *gustar* type

Verbs like *gustar*, *faltar*, *importar* or *sobrar* have a strange syntactic behavior. *Gustar*, for instance, is semantically similar to the English verb *to like*, but their syntactic uses are different, as we can see in (11).

- (11) a. I like apples
b. (A mí) me gustan las manzanas
(to me) 1sgDAT like.PRES.3pl apples

Both sentences have apparently the same logical structure: **like'** (I, apples). However, in English, the first argument of the LS takes the actor macrorole, and the second argument the undergoer, and the actor is selected as PSA. In Spanish, on the other hand, we can see that the second argument of the logical structure is the one selected as PSA of the sentence.

I suggest that the difference between *to like* and *gustar* is similar to the difference between the English verbs *to own* and *to belong*, as it is proposed in Van Valin & LaPolla

(1997). Therefore, I put forward that the logical structures of verbs of the Spanish *gustar* type take only one macrorrole [MR1]. Since they are states, the macrorrole assigned to the argument is the undergoer and this is the argument selected as PSA. The first argument, on the other hand, does not take a macrorrole and it is realized as a dative clitic and as an optional PP, as we can see in figure 2.

[INSERT FIGURE 2]

Figure 2. *Linking in “me gustan las manzanas” (gustar type)*

Therefore, as we can see, verbs like *gustar*, *faltar*, *importar* or *sobrar* are all states, that, in spite of having two semantic arguments, are M-intransitive. Since they are states, the macrorrole assigned is the undergoer, and the undergoer argument is selected as PSA. Thus, in this kind of sentences the undergoer is already the privileged argument again and, as a consequence, they are incompatible with the lexical phenomenon of *se*.

A very similar case happens with complex verbs as *dar pena/miedo/gusto* (to feel sorrow/fear/delight). Its syntactic behavior is the same of the *gustar* type of verbs, as we can see in (12).

- (12) A mí me da miedo tu opinión
 to me 1sgDAT give-fear your opinion
 I am afraid of your opinion
feel.afraid' (1sg, tu opinión) [MR1]

5. Summary

As we have seen, all the kinds of verbs that are incompatible with *se* in the *non-PSA construction* have one thing in common: they cannot undergo a lexical phenomenon that seeks to privilege the undergoer, either because they don't have macrorrole arguments (*haber* type) or because their undergoer argument is already privileged (*morir*, *haber* and *gustar* type). Therefore, they are incompatible with *se*.

These data support the proposal that Spanish *se* is the morphological manifestation of a lexical phenomenon that modifies the logical structure of the sentence, diminishing the actor's importance and privileging the undergoer when it is present (González Vergara 2006, 2009).

6. A real exception

In spite of this, verbs of the *morir* type are expressed sometimes with *se* in a *non-PSA construction*, as we can see in (13).

- (13) Se muere/moría bien cuando se muere/moría por un ideal

REFL die.PRES/IMPF well when REFL die.PRES/IMPF for an ideal

One dies/used to die well when one dies/used to die for an ideal

This is not a very frequent kind of sentence, but it is grammatical. However, a sentence like (14) seems to be impossible:

(14) *Se murió en la guerra

REFL die.PAST in the war

One died in the war

Thus, it appears that the verb *morir* needs to have an imperfect aspect operator to appear with *se*. We also have to notice that the meaning of (13) is very similar to an attributive sentence like *la muerte puede ser buena cuando es por un ideal* (dying can be good when it happens for an ideal). These are the characteristic properties of the Spanish middle construction (Felú, 2008; González Vergara, 2006, 2009).

Therefore, we can put forward that, under certain conditions, proper of the Spanish middle construction (imperfect aspect and possible modality operators, and attributive meaning) verbs of the “morir” type are actually compatible with *se*.

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TABLES AND FIGURES

TABLE 1

CONSTRUCTION: SPANISH MIDDLE SENTENCE
<p>SYNTAX</p> <p>Template: AGX in nucleus [1]</p> <p>Argument modulation: central positions are reduced in 1 [2]</p> <p>PSA modulation: variable [3]</p> <ul style="list-style-type: none">- Undergoer argument [-human]: the undergoer argument is selected as PSA- Undergoer argument [+human]: no argument is selected as PSA <p>MORPHOLOGY</p> <p>Verb: active voice [5], imperfect aspect [6]</p> <p>Morpheme <i>se</i> in AGX node [7]</p> <p>SEMANTICS</p> <p>Property interpretation, related to the modality operator <i>POSSIBLE</i> [8]</p> <p>PSA is not the instigator of the state of affairs, but it is affected by it</p> <p>PRAGMATICS</p> <p>Focal structure: predicate focus (default) [9]</p> <p>Illocutionary force: unspecified</p>

FIGURE 1

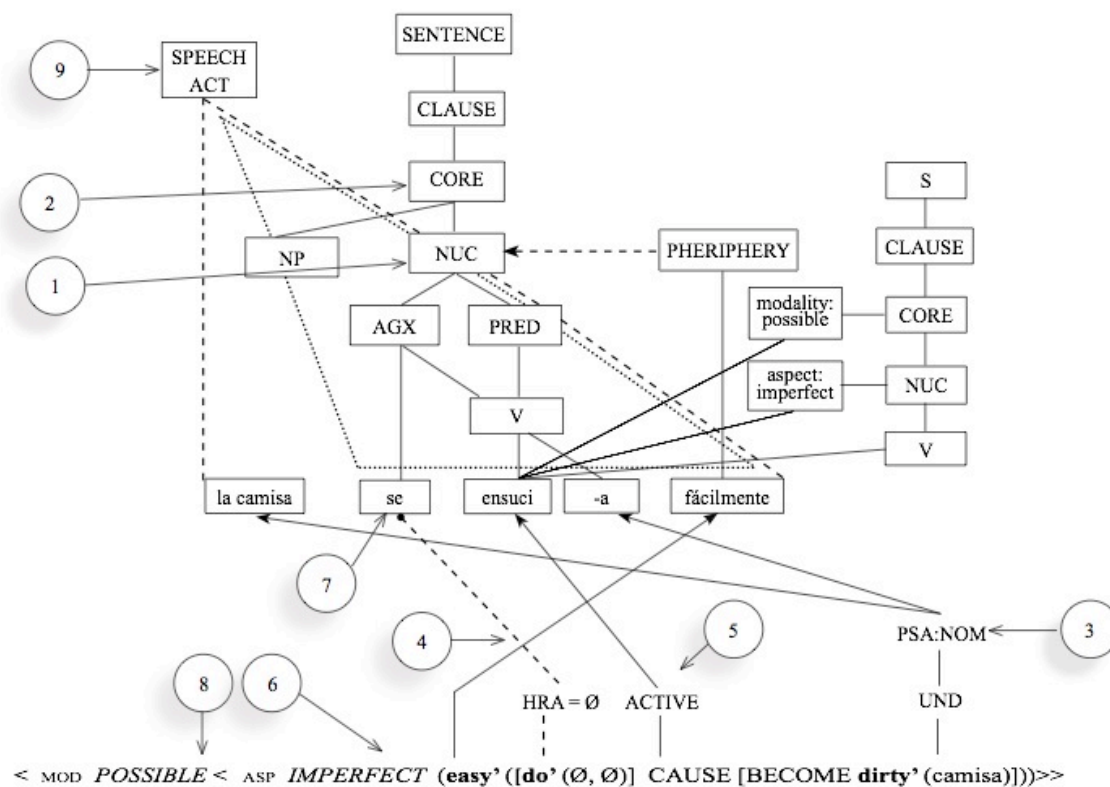
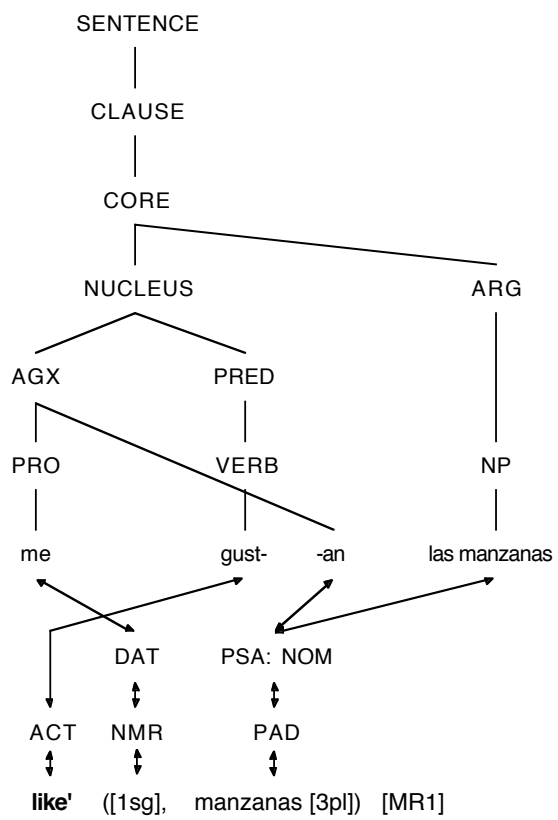


FIGURE 2



EXTENDING THE CHALLENGE OF CONTROL PHENOMENA

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Abstract

Within a semantic approach, control phenomenon is understood as a property of infinitival clauses based on the semantic properties of matrix verbs (Foley and Van Valin 1984; Comrie 1985; Cutrer 1993): aspectual, modal, and desiderative predicates show actor control, whereas implicative and jussive verbs show undergoer control. That is, control as a property of complementation (Landau 2000). More recently, Van Valin (2005) posits that control may not be a uniform phenomenon since controllers may vary from construction to construction even within a language (e.g. English shows syntactic controllers in coordinate sentences, but semantic controllers in infinitive clauses). The present study examines cases of control relations based on Southern Uto-Aztecan languages. The analysis focuses on a special type of adverbial subordination: purpose relations. It is shown that control phenomena are not restricted to the domain of complementation or particular syntactic structure, but it results from the semantics and pragmatics of certain construction types.

Keywords: semantic control, purpose, complementation, Uto-Aztecan languages

1. Introduction

In simple clauses, the semantic notion of goal can add information to the internal aspectual structure of the event. In contrast to pure motion (1a), the sentence in (1b) implies two sub-events, the action of running and the resulting change of location as *Aurelia arriving at the store*. The notion of reaching a goal is likewise expressed within motion-cum-purpose (2a) and purpose (2b) constructions, where the main clause encodes an action and the dependent clause, the purpose unit, expresses the motivating event.

- | | | |
|-----|-----------------------|---|
| (1) | a. motion | <i>Aurelia ran every morning</i> |
| | b. motion + goal | <i>Aurelia ran to the store</i> |
| (2) | a. motion + purpose | <i>Aurelia went to buy milk</i> |
| | b. activity + purpose | <i>Aurelia bought milk to prepare a milkshake</i> |

This paper investigates the syntactic and semantic properties of purpose relations, an intriguing but very much ignored clause in the literature of subordination. Previous works on the topic are Thompson (1985) and Jones (1991) on English purpose clauses, and more recently Verstrate (2008) and Schmidtke-Bode (2009) from a typological perspective. For the study of purpose relations, two apparently conflicting assumptions come into sight:

- Syntactically, purpose clauses are considered as a type of adverbial subordination, i.e. argument-adjunct (Jones 1991), peripheral unit (Van Valin & LaPolla 1997; Ernst 2001: 355), a special type of resultative (Nedjalkov 1998)

- Semantically, purpose clauses share meanings with other complex sentences such as explanation (reason and cause clauses), future-oriented (sequential clauses), and intention (modal clauses) (Givón 2001; Cristofaro 2003)

In turn, purpose can be grouped with other semantic relations within the domain of adverbial subordination, such as cause and reason clauses, or can be aligned with certain complement relations as in desideratives. In the former, the syntactic and semantic properties of the dependent unit are barely restricted by the main clause, as long as the event is unrealized. In the latter, such properties can be determined by the whole clause in a similar way that complement-taking predicates specify the morpho-syntactic properties of a dependent unit.

The aim of this paper is to demonstrate that purposive linkages are not privative of adverbial subordinations or infinitive complements, but they serve as a general strategy of clause union. Indeed, complex structures taking a purposive linkage evoke a set of semantic notions including volition, future expectation, the participant's willingness towards the realization of another action and, most importantly, semantic control relations. That is, purposes always entail a referential dependence between a core argument of the matrix unit and an argument of the linked core (cf. Curter 1993, Van Valin 2009); most of the time, the pivot or controllee is covert but it can be also a copied pronoun (Stiebels 2007). The analysis focuses on Southern Uto-Aztecan languages; Yaqui (Taracahita) will be analyzed in detailed since it is the language of which I have sufficient data from fieldwork. The data come from reference grammars, grammatical sketches, as well as other linguistic materials. The organization is as follows. Next section provides a definition and major characteristics of purpose clauses cross-linguistically; §3 outlines the different strategies for coding purpose relations found in Southern Uto-Aztecan languages and explores first their syntactic properties, and then §4 their semantic characteristics, where special attention is placed on the notion of semantic control. Last section §5 highlights the fact that purposive linkages are not exclusive of the adverbial domain but they also combine with specific complement-taking predicates in the family.

2. Defining purpose clauses

A purpose clause encodes a particular relation between two events. This relation is such that one of the linked events (the one coded by the main unit) is performed with the goal of obtaining the realization of the other one (the one coded by the purpose or dependent event) (Cristofaro 2003: 157; 2005). As an adverbial relation, purposes fall on the group of adverbial clauses coding a proposition, hence they cannot be substituted by adverbs or adverbial phrases (Thompson & Longacre 1985; Matthiessen & Thompson 1988; Thompson *et al* 2007). In addition, purposes are considered a type of clause-modifying strategy which imposes few restrictions over the event with which they relate “which correctly predicts their relative freedom” (Ernst 2001: 355-6).

Although the semantic characterization is very much the same, the formal structure of purpose clauses varies even within the same language. In English, they can be expressed by an adverbial clause introduced by *in order to* (3a), the linker *so that* (3b), as well as by an infinitive clause introduced by *to* (3c). In Nupé (Kwa; Nigeria) purpose is expressed by verbal serialization without linkers (3d); in Triqui, the two unites are juxtaposed and the intentional meaning is expressed by the anticipatory mood coded by tone (3e); in Modern Greek, the purpose is expressed by means of a subjunctive clause and a general subordinator (3f); in Turkish (3g) it takes the form of an infinitival additionally introduced by a clause linkage

marker; finally, in some Bantu languages a purpose clause (3h) is equally marked on the verb as a benefactive nominal argument (3i).¹ In the examples, the purposive unit is in brackets.

- (3) a. *I came [in order to help you with the cooking]*
- b. *I came [so that I can help you with the cooking]*
- c. *I came [to help you with the cooking]*
- d. *Musa bé [lá èbi]*
Musa came took knife
'Musa came to take the knife.' (Nupé; George 1975)
- e. *Ri³ki²³ i³ ċha³ [žá⁵h]*
gave the tortilla will.eat.I
'You gave me tortilla for me to eat.' (Chicahuaxtla Triqui; in Longacre 2007: 397)
- f. *írφame [na se voiφíso]*
come.PAST.1PL SBJV 2SG.ACC help.1PL
'We came (in order) to help you.'
(Modern Greek; Joseph & Philippaki-Warbuton 1987:31)
- g. [*Çarşı-ya git-mek üzere*] *otobüs-e bin-di*
market-DAT go-INF in.order.to bus-DAT get.on-PAST.3
'She got on the bus to go to the market.' (Turkish; Lewis 1967:167-8)
- h. *Abaantu bi-iig-ir-a [ku-menya ubwéenge]*
people SUB.PRO-study-BEN-ASP INF-know knowledge
'People study in order to learn.'
- i. *Umugóre a-rá-kor-er-a umugabo*
woman SUB.PRO-PRES-work-BEN-ASP man
'The woman is working for the man.' (Kinyarwanda; Kimenyi 1976)

There is a general assumption that goal and purpose, like companions, beneficiaries, instruments, sources, and locations tend to be associated to non-core arguments hence marked as oblique. Yet, in several languages the case marker used for datives, benefactives or allatives (Haspelmath 2003) is used also for purpose relations. In English, recipients, goals, and purpose are all introduced by the preposition *to*. The very same preposition can encode a result state for some action described in the main verb (Hoekstra 1998) as in *the surprise brought Linda to unconsciousness*. Besides some semantic and pragmatic differences, in Spanish there is an overlap between the prepositions *a* 'to' and *para* 'for' introducing spatial

¹Abbreviations: 1, 2, 3: first, second, third person; A: ergative, B ~ ABS: absolutive, ACC: accusative, AND: andative, APPL: applicative, ASP: aspect, BEN: benefactive, CONT: continuative, CLS: classifier, COMP: completive, DAT: dative, DEF: defined, DES: desiderative, DEM: demonstrative, DET: determiners, DIR: directional, EMPH: emphatic, FUT: future, GEN: genitive, INCOMP: incomplete, INF: infinitive, INSTR: instrumental, INTEN: intensifier, IMPFV: imperfective, LOC: locative, NEG: negation, NF: non finite, NOM: nominative, PAS: passive, PAST: past, POT: potential, PFV: perfective, PL: plural, PRES: present, PRO: pronominal, PURP: purpose, REF: referential, RDP: reduplication, SG: singular, SUB: subject, SBJV: subjunctive.

goal (4a), beneficiaries (4b), motion-cum-purpose (4c) but not purpose clauses (4d). As in English, different purpose clauses involve extra morphology as in *Juan compró un pastel [para que su hijo lo llevara a la fiesta]* ‘John bought a cake in order for his son to take it to the party.’

- (4) a. *Juan fue a / para la tienda*_{Goal}
 ‘John went to the store.’
- b. *Juan le compró un pastel a María*_{Ben}
- b’. *Juan compró un pastel para María*_{Ben}
 ‘John bought a cake to/for Mary.’
- c. *Juan fue a la tienda [a / para comprar un pastel]*_{Purp}
 ‘John went to the store to buy a cake.’
- d. *Juan compró un pastel [*a / para llevarlo a la fiesta]*_{Purp}
 ‘John bought a cake to/in order to take it to the party.’

The most typical case of purpose relations involves motion verbs in the main unit. In Mayan languages, the motion can come out as an independent verb, auxiliary or verbal affix (Zavala 1993). Compared to the full coding of TAME morphology and pronominal markers in main predicates, the intransitive purpose clauses in (4a) from Akatek show how the dependent unit shows up as non-finite clause ‘subordinated’ to the previous predicate without any subordinator (Zavala 1993: 25-6). In Q’eq’chi, the purpose event in (4b) is introduced by the clause linkage marker *chi*, whereas in (4c) the motion and purpose events are fully attached in a co-lexicalized structure.²

- (4) a. *Ch-in-too-ok-toj* [wey an b’ey s-sat ko-tx’at tu’]
 INC-B1S-go-DIR:in-DIR:thither sleep CL1S to A3-face A1P-bed DIST
 ‘I am going to sleep in our bed.’
- b. *T-in-xik* [chi b’ane’k]
 FUT-B1-go CLM cure.PASS
 ‘I will go to be cured.’ (Bernstein 1985: 262; cited in Zavala 1993: 55)
- c. *S-ul-in-atin-q*
 CM-come-B1-bathe-NF
 ‘I came to bathe.’ (Stewart 1978: 144; cited in Zavala 1993: 54)

Moreover, purposes are traditionally associated with cause and reason adverbial relations; the three relations provide explanations or accounts for the occurrence of a given state or action, except that purposes express a motivating event where the intended result is yet to be achieved (Kortmann 1997: 86); less finite (5a) vs. more finite (5b).

² As it happens with many other semantic relations, ‘purpose’ can be expressed too by means of constructions involving two coordinated sentences as in *I will go to the store (and) I will buy some milk*. Only sentences showing some degree of integration –syntactic and/or semantic– are considered in this study.

- (5) a. *Biska* [Monguno-ro lete-ro tawange] ciwoko
 yesterday Monguno-to go.NF-ro early:1SG get.up:1SG:PAST
 ‘Yesterday, I got up early to go to Monguno.’
- b. *Biska* [Monguno-ro lenging-də-ro tawange] ciwoko
 yesterday Monguno-to go.1SG:IMPFV-DEF-ro early:1SG get.up:1SG:PAST
 ‘Yesterday, I got up early because I was going to Monguno.’ (Hutchison 1976: 147)

3. Southern Uto-Aztecan purpose clauses

In the Southern branch of the Uto-Aztecan family, three major structures coding purpose are found: the motion-cum-purpose clause type (6a) and (6b), the intentional clause type (6c), and the finality clause type (6d). The first type is restricted to motion verbs in the main unit, such as the notion of intention is inferred by the construction as a whole; the intentional and finality types involve any kind of activity predicate plus the purpose unit; in the former, there is an explicit volitional/desiderative verbal marker in the dependent unit, while in the latter there is a clause linkage marker indicating the semantic relations among the two units. There is also a distinction in terms of animacy: intentional purpose demands human actors; motion-cum-purpose and finality allows animates, but only the last type allows inanimate entities as main actors.

(6) Motion-cum-purpose type

- a. *Huma hihim* [va’igiti igai]
 together go:CONT bring DEM
 ‘Together (they) went to bring (them).’ (Pima; Estrada 1998: 34)
- b. *Lupe-Ø wakas-ta jinu-se-k*
 Lupe-NOM meat-ACC buy-PURP.SG-PFV
 ‘Lupe went to buy the meat.’ (Yaqui)

Intentional type

- c. *Wanita werumá puusi-ta-re* [kawé nene-narí=a]
 Juana big eye-make-PFV well see-DES-EMPH
 ‘Juanita opened her eyes a lot to see better.’ (Guarijío; Félix: 2005:321)

Finality type

- d. *Min-Ø u-ka kaba’i-ta nenka-k* [kaba’ite-ne-betchi’ibo]
 Min-NOM DET-ACC horse-ACC buy-PFV horse.ride-POT-PURP
 ‘Fermín bought a horse to ride on it.’ (Yaqui)

The syntactic characteristics of purpose types are examined next based on: (i) argument coding (i.e., the omission of an argument, its expression as accusative, possessor or oblique); (ii) operator coding (i.e., the verb form employed, whether it is finite, non-finite, or it has a special form); (iii) the scope of negation; (iv) the presence of clause linkage markers, and (v) the position of the linked unit with respect to the main clause.

3.1. *Argument coding.* Purpose relations do not logically entail the participants of the dependent unit or whether the performer of the main action controls the realization of the dependent one (Cristofaro 2003: 157). Yet the first most striking feature of purposes is the necessarily occurrence of an argument in the dependent unit which must be identified with one core argument of the matrix clause. In the most typical situation, the main and dependent

actors are the same and so the dependent actor is absent; that must be the case for purpose of motion (7a) and intentional clause types (7b).

(7) a. Motion-cum-purpose type

Nabí=rawe=mu_i ee-héna-ni [____i i'á-mi kawaí]?
 every=day=2SG.NOM RDP-come-PRES look.for-FUT horse
 'You come every day to look for the horse?' (Guarijío; Miller 1993: 104)

b. Intentional type

Wanita_i werumá puusi-ta-re [____i kawé nene-narí=a]
 Juana big eye-make-PFV well see-DES-EMPH
 'Juanita opened her eyes a lot wanting to see better.' (Guarijío; Félix 2005:321)

Many languages have distinct syntax for purpose clauses whose subjects are different (Thompson and Longacre 1985: 187). Data is scarce, but at least in Yaqui and Guarijío, finality structures work well for both same subjects (8a) and different subjects (8b); notice that the dependent actor is marked accusative when it is different to the main actor. The occurrence of extra morphology like the adverbs *ruhka* and *olaga* 'like this' (8c) in Guarijío is not rare –but not obligatory– with different subjects.

(8) Finality type

a. *U o'ou-Ø_i uya-u siika [____i mas-ta me'e-betchi'ibo]*
 DET man-NOM mount-DIR go.SG.PFV deer-ACC kill.SG-PURP
 'The man went to the mount to kill the deer.' (Yaqui)

b. *U maso-Ø_i bwite-k [u-ka o'ou-ta_j ka a_i me'e-ne-betchi'ibo]*
 DET deer-NOM run.SG-PFV DET-ACC man-ACC NEG 3SG.ACC kill.SG-POT-PURP
 'The deer ran quickly so that to the man wouldn't kill him.' (Yaqui)

c. *Oí-re [ihí-bo olága]*
 invite-PAS drink-PURP.PL like.this
 '(He_i) invited them ____{i+v} to drink.' (Guarijío; Miller 1993: 206)

There is one important consideration in the study of purpose relations: there **must be** one shared participant between the two units, such as a main core argument controls the identity of an argument of the dependent unit, i.e. semantic control relation. Outside purely syntactic definitions, control is generally associated to an absent controllee (gap) in the linked unit. I am adopting Stiebels (2007) control's definition, where the controllee may be also a pronominal argument as long as there is a **referential dependency** among the two cores. Thus, the controllee can be either absent (a syntactic missing argument) or overt (a non-referential copied pronoun). Stiebels also proposes a different set of semantic control patterns:

(9) Different control patterns (cf. Stiebels 2007)

i. Exhaustive: the referents of the controller and controllee overlap completely

Sue_i wants ____i to leave

ii. Partial: the controller's reference is property included in the controllee's referents

Sue_i wants ____{i+v} to meet

- iii. Split: two arguments of the control predicate jointly control the controllee
Carl_i want to go to the market with Rose_j ____{i+j} to buy some wine
- iv. Arbitrary: there is no local controller³
____{arb} to smoke around babies_i is dangerous for them_i

The semantic notion of control is crucial for purpose relations when the subjects are different, since other instances of semantic correlation may take place. In contrast to the main actor controlling the identity of the dependent actor in (8a), the main actor controls the dependent undergoer in *the deer ran in order for the man not to kill it* (8b); the two cases show exhaustive control, in terms of Stiebels. In (8c), there is a partial control relation, since the main actor is hopefully included in the set of people who will drink. A more complex situation is found when the main clause is transitive. In (10a) below, both the main actor controls the identity of the dependent actor, and the main undergoer controls the dependent undergoer; in (10b), the main undergoer controls the identity of the missing actor in the linked unit; though the theme is also shared, there is a coreferential pronoun *am* ‘them’ in the dependent unit; in (10c) the main undergoer controls the identity of an optional instrument phrase. The examples are from Yaqui.

(10) Finality type

- a. *Min-Ø_i u-ka kaba’i-ta_j nenka-k [____i ____j kaba’ite-ne-betchi’ibo]*
 Min-NOM DET-ACC horse-ACC buy-PFV horse.ride-POT-PURP
 ‘Fermin bought a horse to ride on it.’ (Yaqui)
- b. *Min-Ø_i u-ka yoi-ta_j kaba’i-m_k reuwa-bae*
 Min-NOM DET-ACU yori-ACC horse-PL lend-DES

[____j am_k wiria-ne-betchi’ibo]
 3PL.ACC feed-POT-PURP
 ‘Fermin wants to lend the foreigner the horses in order for him to feed them.’
- c. *Min-Ø_i u-ka tractor-ta_j jinu-k*
 Min-NOM DET-ACC tractor-ACC buy-PFV

[enchi_k (a-e)_j bwia-ta tekpanoa-ne-betchi’ibo]
 2SG.ACC 3SG.NS-with land-ACC work-POT-PURP
 ‘Fermín bought the tractor in order for you to work the land (with it).’

Therefore, the controllee is absent in (10a), but not in (10c) where there is an indexed pronominal phrase; (10b) shows both situations. In addition, due to word-formation requirements, Náhuatl and Corachol motion-*cum*-purpose structures disallow the omission of the dependent actor (11a); however, it cannot be either a full NP or an independent pronoun. That is, an elaborated NP is disallowed, only co-indexed pronouns are allowed.

(11) a. Motion-*cum*-purpose type

- Ni-yawi [ni-k-tegi-ti tro:ha chi:hli]*
 1SG-go 1SG-3O-cut-AND a.lot chile
 ‘I am going to cut a lot of chile.’ (Pajapan Nahuatl; Peralta 2007)

³ Rather than arbitrary, this situation clearly involves pragmatic factors, i.e. the speaker has somebody in mind.

a'. *Ni-yawi* * \emptyset -*k-tegi-ti tro:ha chi:hli*

a''. *Ni-yawi* *[*newa ni-k-tegi-ti tro:ha chi:hli*]

3.2. *Operator coding.* A purpose relation is oriented toward a time subsequent to that of the main verb. Cross-linguistically, the operator information is usually unmarked (infinitive) or limited to future, potential, irrealis or subjunctive meanings (non-finite forms). Regardless the tempo-aspectual marking of the main unit, intentional structures must be unmarked (12a) whereas motion-*cum*-purpose and finality both allow future-like suffixes, except when the motion event is attached to the intended event forming a complex predication (12c).⁴

(12) a. Intentional type

Goyo-Ø_i wikia-ta jaiwa-k [_i *kaba'i-ta suma-bae-kai*]
 Goyo-NOM rope-ACC look.for-PFV horse-ACC tie-DES-CLM
 'Goyo was looking for a rope wanting to tie the horse.' (Yaqui)

b. Motion-*cum*-purpose type

Pedro_i moená-re [_i *potacé-mia karí howará-chi*]
 Peter climb-PFV cover-FUT/PURP house hole-LOC
 'Peter climbed up to cover the hole in the house's roof.' (Guarijío; Félix 2005:323)

c. *Awí-si-nir-i*

dance-motion-DES-IMPF
 'She wanted to go along dancing.' (Tarahumara; Caballero 2008: 140)

The examples below show the scope of the deontic modal *-maachi*, a core operator. It modifies the two cores in purpose of motion and intentional structures (13a-b); but for finality, the operator has scope only within the first core (13c). Additionally, only finality clauses allow a temporal adverb *yooko* 'tomorrow' inside the linked unit (13c) and, under certain conditions, the dependent verb can be affected by passivization (13d). Indeed, passive voice is very restricted in this kind of construction.

(13) a. Motion-*cum*-purpose type

Lupe-Ø wakas-ta jinu-se-maachi.
 Lupe-NOM meat-ACC buy-PURP.SG-SHOULD
 'Lupe should go to buy the meat.'

b. Intentional type

Lupe-Ø_i wakas-ta jinu-maachi [_i *wakabak-ta ya'a-bae-kai*]
 Lupe-NOM meat-ACC buy-SHOULD wakabaki-ACC make-DES-CLM
 'Lupe should buy meat to cook the wakabaki.'

c. Finality type

Lupe-Ø_i wakas-ta jinu-maachi [_i *wakabak-ta yooko*]
 Lupe-NOM meat-ACC buy-SHOULD wakabaki-ACC tomorrow

⁴ The situation regarding TAM operators is to some extent complicated. There are no 'pure' tense markers; the tempo-aspectual suffixes expressing future, irrealis, and potential are historically derived from the suppletive stems 'go (sg/pl)' and 'die (sg/pl)', i.e. a morpheme like *-mia* (11b) can be glossed as future as well as purpose of motion. This situation corroborates the strong correlation between purpose, desire, future-oriented events, goal and allative meanings (cf. Haspelmath 1988).

ya'a-ne-betchi'ibo]

make-POT-CLM

'Lupe should buy the meat in order to cook the wakabaki tomorrow.'

- d. *Lupe-Ø wakas-ta_i jinu-k [_____{arb} wakabak-ta_i*
 Lupe-NOM meat-ACC buy-PFV wakabaki-ACC

ya'a-na-wa-betchi'ibo]

make-POT-PAS-CLM

'Lupe bought the meat in order for the wakabaki to be cooked (by someone else).'

3.3 *Negation*. Languages might show a different structure in a situation where the main action takes place in order to prevent another event from occurring. Data is sparse but purpose of motion and intentional structures limit the scope of negation to the main action (13a), but negation can be allocated in both the main or linked units inside a finality clause (13b).

- (13) a. Motion-*cum*-purpose type

Joan-Ø kaa aabo kochi-se-k

John-NOM NEG here sleep-PURP:SG-PFV

'John didn't come to sleep here/ *John come to not sleep here.' (Yaqui)

- b. Finality type

Tiburcio hená [ka'í amó tewi-mí ruhka]

Tiburcio come.PFV NEG 2SG:NS see-PURP like.this

'Tiburcio came so that you couldn't see him.' (Guarijío; Miller 1993: 136)

3.4. *The presence of CLM*. Since purpose clauses are essentially goal-oriented, they are usually introduced by clause linkage markers indicating benefactive and dative arguments, as well as recipient, allative, and goals. Apart from the Uto-Aztecan markers historically related to motion, purpose of motion appears generally unmarked; the intentional structure is unmarked in Guarijío but marked by the sequence desiderative-same subject marker in Yaqui (14a). Finality structures all display an overt marker: it can be the same indicating benefactives (14b-b') in Pima, Yaqui and Guarijío; it can be the same marking instrumentals (14c-c') in Huichol, or a general connector which easily marks some adverbials, complements and coordinate units inside the Tepiman sub-branch (14d).

- (14) Intentional type

- a. *Te_i saja-k [_____i yi'i-bae-kai]*

1PL:NOM go:PL-PFV dance-DES-CLM

'We left because we want to dance.' (Yaqui)

Finality type (14b')

- b. *Higai timiti-m in taan a-daad-vuika*

3SG tortilla-PL 1SG.O ask 3SG:O-mother-PURP

'She asked me for tortillas for her mother.' (Pima; Estrada 1988: 80)

- b'. *Aani sudag nukad [_____i i'i-ag-vuika]*

1SG water have:IMPF drink-FUT-PURP

'I don't have water to drink.' (Pima; Estrada 1988: 59)

c. Finality type (14c')

Miiki yu-k̄iye-k̄i me-pe-i-kuuwaaʔi
 3PL REFL-stick-INSTR 3PL:S-AS-3SG:O-beat
 'They beat him with their stick.' (Huichol; Comrie 1982: 103)

c'. *Kareta ne-p-e-nanai [k̄iye-xi ne-'ikata-mi-k̄i]*
 cart 1SG:S-ASI-INV-buy:PFV wood-PL 1SG:S-carry-IMPL-INST
 'I bought the cart to carry out the wood.' (Huichol; Gómez 1988: 172)

d. *Gu chi-chioñi bopa-m̄it [na-m̄it ___i tusa-m gu tai]*
 DET RED.PL-man run-PFV CLM-PFV extinguish-OBJ DET fire
 'The men run to extinguish the fire.' (S. Tepehuan; García Salido 2008)

3.5. *The position of the purposive unit.* For adverbials in general, Diessel (2001) claims that in languages in which adverbial clauses have a final subordinator, the dependent unit tends to precede the main clause, whereas in languages with initial subordinator, the adverbial unit may occur in both sentence-initial and sentence-final. For purpose in particular, it has been observed that the purposive unit usually follows the main action, although it may also appear pre-posed with a different, more general meaning (Thompson 1985: 61). In the family, purpose does exhibit a rather fixed position: they follow the main action regardless whether the clause linkage marker appears at the beginning as in (14d) or the end as in (14a), (14b') and (14c'). This motivating action-purpose events order mimics the chronological order of those events, as they are supposed to have occurred in the real world.

3.6. *The juncture-nexus relations of purpose.* Therefore, the morpho-syntactic characteristics defining purpose clauses yield non-subordinated nexus relations at the core level and, just for certain types of finality clauses, at the clause level. A brief summary of such properties is listed below.

Motion-cum-purpose type

- the main actor controls the dependent actor
- the controllee is covert except in Nahuatl, Cora and Huichol (argument dependency)
- the linked event is future-oriented, and then unmarked or marked by a special set of morphemes (irrealis, potential) but not for tense and mood (operator dependency)
- the linked unit cannot be negated
- the linked unit lacks CLMs
- the purposive unit follows the main action
- Therefore: nuclear or core cosubordination & core coordination, depending on (i) the valence of the dependent verb, and (ii) whether the linked verb takes aspectual

b) Intentional type

- the matrix actor controls the dependent actor
- the controllee is always covert (argument dependency)
- the intended verb is only marked by the desiderative forms only (operator dependency)
- the dependent unit cannot be negated
- Guarijío lacks CLMs but Yaqui takes a special same-subject marker *-kai*
- the dependent unit cannot be negated
- the dependent unit must follow the main action
- Therefore: core cosubordination

Finality type

- the matrix actor can be the same and different than the dependent actor
 - the controllee is preferably omitted within the linked unit (argument dependency)
 - the dependent verb can be optionally marked by aspectual-like morphemes
 - the linked unit can be negated independently of the matrix clause,
 - there is an overt clause linkage marker indicating the idea of ‘purpose’
 - the dependent unit follows the matrix clause
- Therefore, core coordination ⁵

At this point, it is important to know how a typical adverbial relation looks like in Yaqui, in order to understand how a purpose relation differs from this domain. The examples below illustrate typical cases of ad-clausal subordination. The closely related reason construction is introduced by *bweituk* ‘because’ (15a). Notice that in (15a), the clause linkage marker is right in the middle of the two units; although identical, the linked unit explicitly codes its actor as a nominative and full pronoun, and this is impossible in purpose relations; also, the dependent verb is fully marked by TAM operators and it can appear at the beginning of the clause as in (15a’). The last examples illustrate two temporal related constructions. The sequential subordinator *-o* (15b) and the simultaneity *-kai* in (15c) are both linked to the dependent unit; the linked verbs are fully marked by tempo-aspectual operators, and the order among the two clauses are relatively free. Notice also that in (15c) the dependent actor is again accusative.

(15) a. Reason clauses

Te saja-k bweituk itepo ka ye’e-k
1PL:NOM go.PL-PFV because 1PL:NOM NEG dance-PFV
‘We left because we didn’t get to dance.’

a’. *Bweituk itepo ka ye’e-k te saja-k*
because 1PL:NOM NEG dance-PFV 1PL:NOM go.PL-PFV
‘Because we didn’t get to dance, we left.’

b. Temporal clauses

Te saja-k Goyo-ta aabo yepsa-k-o
1PL:NOM go.PL-PFV Goyo-ACC here arrive.SG-PFV-CLM
‘We left when Goyo arrived.’

c. *Joan-Ø kot-bae [jiba yepsa-kai]*
Joan-NOM sleep-want just arrive-CLM
‘John_i is going to sleep as soon as he_i arrives.’

c’. *[jiba yepsa-kai] Joan-Ø kot-bae*
just arrive-CLM Joan-NOM sleep-want
‘As soon as he_i arrives, John_i is going to sleep.’

4. The semantics of purpose clauses

Semantically, a purpose linkage evokes intention and personal thoughts, future expectation, and the participant’s willingness for another state of affairs to take place –and this alone can be a reason and motivation to actually do something. The semantic sub-hierarchies proposed by RRG in (16), are valid for both complement and adverbial relations.

⁵ Constructions like those in (14d) can be analyzed as clausal coordination.

- (16) Semantic sub-hierarchies (Van Valin 2005; Guerrero 2006)
- a. Temporal hierarchy:
Phase of a single event > simultaneous events > sequential events > unspecified
 - b. Causal hierarchy: physical > verbal > underspecified_[non-defeasible], inferred_[defeasible]
 - c. Participant's mental disposition (PMD):
Intention > internal/direct experience > mental experience: commitment > mental experience: reasoning > non-mental experience: report
 - d. Necessarily shared participant (NSP): Yes > No

Based on these semantic sub-hierarchies, the three purpose strategies are evaluated in Table 1. The only strategy that can be clearly differentiated is motion-*cum*-purpose which can be conceived as macro-event where the motion and the intended actions are two phases of a single event (first value of the temporal scale).

	temporality	causal	PMD	NSP
motion-cum-purpose	1 st value	4 th value	1 st value	1 st value
intentional	3 rd value	4 th value	1 st value	1 st value
finality	3 rd value	4 th value	1 st value	1 st value

Table 1. Degree of semantic cohesion of purpose clauses

Then, it seems it is hard to predict the morpho-syntactic differences between the three purpose clause types based on the juncture-nexus relationships (i.e. core non-subordination) and their degree of semantic cohesion. Still, there is one semantic feature that can distinguish among each type: semantic control relations. By analyzing purpose clauses in English, Cutrer (1993:178) demonstrates that this construction type really involve two control relations: the first one on the dependent actor and the second one on the dependent theme; the former can be optional (different subjects), but not the latter. Likewise, Van Valin (2009: 48) claims that in purpose clauses the obligatory control relationship is between the post-nuclear arguments in each core; the examples below are from Van Valin.

- (17) a. *Pat brought the book_i for her sister to read _____i.*
b. **Pat brought the book for her sister to read **it**.*
- c. *Pat_j brought the book_i _____j to read _____i.*
d. **Pat_j brought the book _____j to read **it**.*
- e. *Pat brought the book in order (for her sister) to read **it**.*
f. **Pat brought the book in order (for her sister) to read ____.*

Thus, while sharing the actor is optional (17a) and (17c), sharing the undergoer (theme) is obligatory (17b) and (17d). This property distinguishes between 'pure' purpose clauses from 'rationale' purpose clauses in (17e), since in the latter there is no obligatory controller-controllee relationship of any kind (i.e. there is not a missing syntactic argument).⁴ So despite the semantic similarities of the two constructions, their syntactic properties are different, particularly with respect to the crucial controller-pivot relationships. In contrast to core non-subordinate linkages for purpose, Cutrer (1993: 177) proposes that clauses like (17e) correspond to clausal junctures.

The essential point here is that all purpose relations necessarily entail a semantic control relation between the two units. In fact, there is no data so far where a purpose relation does not involve any kind of semantic control, i.e. a situation in which all the participants of the main activity and all the participants of the intended event are different entities. Based on these correlations, the semantic sub-hierarchy in (16e) below seeks to examine the different instances of control over a core argument in the linked unit. The scale is based on RRG's theory of control in (18) (Foley & Van Valin 1984), but it goes one step forward since it is not restricted to control matrix predicates.

(18) RRG's theory of obligatory control (Foley and Van Valin 1984)

- a. Causative and jussive verbs have undergoer control
- b. All other (M-)transitive verbs have actor control

(16) e. Semantic control

The matrix actor controls the linked actor > the matrix undergoer controls the linked actor > a matrix argument controls a linked argument

The degree of semantic cohesion and their syntactic manifestation are now fully captured in Table 2. The **first value** reflects such predicates demanding the actor of the matrix unit to be identical to the dependent actor, i.e. actor, agent-oriented or inducing control verbs like phasal, intention, desires, promise, and expectation. The **second value** represents such predicates requiring the undergoer of the matrix verb to control the dependent actor; this is the case of causatives and jussive verbs. Furthermore, the **third value** encodes such cases where a control relation is hold between a core argument of the matrix verb and any core argument of the linked unit, and this is what happens outside complementation: in purpose relations.

	temporality	causal	PMD	NSP	semantic control
purpose of motion	1 st value	4 th value	1 st value	1 st value	1 st value
intentional	3 rd value	4 th value	1 st value	1 st value	1 st value
finality	3 rd value	4 th value	1 st value	1 st value	1 st / 2 nd values
rationale	3 rd value	4 th value	1 st value	1 st value	3 rd value

Table 2. The semantic degree of purpose relations (revised)

What purpose relations evoke are different instances of the controller & the controllee: for the Southern Uto-Aztecan languages, motion-cum-purpose (19a) and intentional linkages (19b) demand actor control. In contrast, finality purpose may show actor control (20a), undergoer control (20b), and other instances of semantic control, e.g. the main undergoer controls the theme or instrument entity in the dependent unit (20c-d); the last type are equivalent to English rationale expressions.

(19) Motion-cum-purpose type: Actor control only

- a. *U-me o'ow-im sinto-ta aabo joo-bo-Ø.*
the-PL man-PL belt-ACC here make-PURP.PL-PRES
'The men come here to make a belt.' (Ya; Guerrero 2006: 128)

Intentional type: Actor control only

- b. a. *U o'ou-Ø bwite-k [maso-ta me'e-bae-kai]*
DET man-NOM run:SG-PFV deer-ACC kill:SG-DES-CLM
'The man ran in order to kill the deer.' (Ya; Guerrero 2006: 129)

(20) Finality type: Actor control

- a. **Tibu-Ø_i** tractor-ta jinu-bae [_____i tekipanoa-ne-betchi'ibo]
 Tibu-NOM tractor-ACC buy-DES work-POT-PURP
 'Tibu wants to buy a tractor to work.'

Finality type: undergoer control

- b. **Inepo Maria-ta_i** tejwa-ne [puatom a_i sabu-e
 1SG.NOM Mary-ACC tell-POT dish:PL 3SG:ACC soap-INST
 baksia-ne-betchibo]
 wash-POT-PURP
 'I'll tell Mary to wash the dishes with soap.'

Finality type: other instances of semantic control

- c. **Tibu-Ø_i** Min-ta_j bicha-k [_____{i&j} beemela tractor-ta jinu-ne-betchi'ibo]
 Tibu-NOM Min-ACC see-PFV new tractor-ACC buy-POT-PURP
 'Tibu met Fermín in order to buy a new tractor (= to go together).'
- d. **Lili-Ø_i** Suichi-u yepsa-Ø
 Lili-NOM Vicam-DIR arrive-PRES
- [Jiak-nok-ta ne a_i majta-ne-betchi'ibo]
 Yaqui-word-ACC 1SG:ACC 3sg:ACC teach-POT-CLM
 'Lili comes to Vicam in order that I teach her Yaqui.'

That is, purpose, as certain complement constructions, obligatorily establishes a control relationship with their dependent unit. As a matter of fact, an additional distinctive feature between purpose and reason/causal adverbial relations is the notion of obligatory semantic control since the last two may but not must undertake semantic control, e.g., *I went to the party because my sister wanted to meet that guy*, while purpose relations must. A first try to establish the logical structures for these purposive linkages is presented in (21) based on the logical structures proposed in Van Valin (2005: 207).

(21) c. Modifying sub-events:

5. Purpose of motion: **want'** (x_i, LS₂) ∧ DO (x_i, [**motion'** (x_i)] ◇ CAUSE [LS₂... x_i...])

d. Psych-action: **want'** (x_i, [LS₂... x...]) ∧ DO (x_i, [LS₁... x_i...] ◇ CAUSE [LS₂... x_i...])

e. Purposive: **want'** (x_i, LS₂) ∧ DO (x_i, [[LS₁... x_i...]] ◇ CAUSE [LS₂...y....])

5. 'Purpose' as a general clause linkage type

Outside the relationship of purpose with other adverbial clauses, little has been said about the semantic and syntactic similarities between purpose and complement relations, like modal verbs (cf. Wierzbicka 1988: 28-9; Givón 2001: 337; Cristofaro 2003: 158). Indeed, one the most common functions of purposive-like linkages is to serve as a (infinitive) complement, e.g., *I wanted to see you but you forgot to call me*.⁶ As said before, certain complement-taking predicates require one argument of the linked unit to be identified to an argument of the

⁶ See Wierzbicka (1988) for a discussion on the semantics of *to*-complements in English. Bresnan (1979) previously suggests that *to*- and *for*-complements show an inherent intentional meaning which interacts with contextual semantics factors such as main predicates, modality and time.

matrix unit. Cross-linguistically, actor and undergoer control predicates can make use of the same structure encoding purpose relations, and this association seems to be semantically motivated i.e. a clause linkage type evoking motivating activities, volition, intention, future expectation, participant's willingness and, crucially, the obligatory semantic control relations determined by the semantics of the whole structure and/or pragmatic factors.⁷

At least for the Taracahita sub-branch of the Uto-Aztecan family, actor control verbs (22) and undergoer control verbs (23) make use of the same purposive linkage, at least, as one of the alternative syntactic structures.

(22) Actor control matrix verbs

- a. *Maria-Ø bo'obicha-Ø [sim-bae-kai]*
 Mary-NOM hope-PRE go:SG-DES-CLM
 'Mary expects to leave.' (yaqui)
- b. *Maria-Ø bo'obicha-Ø [sim-betchi'ibo]*
 Mary-NOM hope-PRE go:SG-PURP
 'Mary expects to leave' / 'Mary hopes to leave.' (Yaqui)
- c. *Markó natahképa-re [neotoé-mia echitiame tapaná]*
 Mark forget-PFV water-PURP plants yesterday
 'Mark forgot to water the plants yesterday.' (Guarijío; Félix: 2006: 325)
- d. *Puyé-na-temé [tekihpána-mia encí semana-chi]*
 expect-PRE-1PL:S work-PURP again week-LOC
 'We expect to work next week.' (Guarijío; Félix: 2006: 327)

(23) Undergoer control matrix verbs

- a. *Gema-gá asá [mapuregá ke ruráre-ma]*
 blanket-GER sit.IMP CLM NEG cold-CAUSE-FUT
 'You stay under the blanket to keep warm.' (Tarahumara; Brambila 1953: 367)
- b. *Alué-ka nakí [napurigá nocha-ma ne]*
 3SG-EMPH want CLM work-FUT 1SG
 'He wants me to work.' (Tarahumara; Burgess 1984: 123)
- c. *Ne junuen'ea-Ø [enchi kari-ta tute-ne-betchi'ibo]*
 1SG:NOM thus.think-PRE 2SG:ACC house-ACC clean-POT-PURP
 'I wish that you would clean the house.' (Yaqui)
- d. *Rolando ki = nahki [ena-michio Pedro]*
 Rolando NEG=want come-PURP Pedro
 'Rolando doesn't want Peter to come.' (Guarijío; Félix: 2006: 198)

These constructions share four crucial aspects:

- i. they reflect an overtone of intention and subsequent events
- ii. they encode the participant's intention for a state of affairs to happen

⁷ English is unusual allowing to-complements with a large number of verbs including raising (e.g. *John appeared to leave*, *Pat believed John to have left*), and even relative clauses (e.g. *A man to talk to her would be John* (Jones 1991: 26)).

- iii. the dependent unit must be future-oriented, and
- iv. there must be a shared core argument which controls the identity of a dependent core argument: the actor for intentional purpose and psych-action predicates, and the undergoer for finality and manipulative meanings.⁸

To sum up, the semantic and syntactic properties of purpose relations and the tightness of the syntactic linkages they establish with the matrix clause (i.e. non-subordination), question the assumed freedom of purpose as peripheral adjuncts. Instead, purpose linkages exhibit a ‘mixed’ behavior between adjunct-like and argument-like functions: (a) as most adverbial clauses, the semantic content they encode may be optional, (b) as directed motion, the intended event can be seen as putting a term to an activity (Garey 1957: 106), and (c) as in complements, their syntax is determined by the matrix clause as a whole.

6. Final remarks

We may wonder whether complement structures have extended their functions to adverbials, or whether adverbial covers several instances of complementation, or whether there is a semantically and structurally compatible linkage type for the two semantic relations. My suggestion is that languages might make use of a single clause linkage type that, because of its very nature, easily combines with both adverbial and complement relations evoking certain semantic features, i.e. intention, future expectation, participant’s willingness and, crucially, the obligatory control relations, determined by the semantics of the whole structure and by pragmatic factors.

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Topic, focus, and word order in the acquisition of Spanish

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Abstract

In this presentation, I intend to explain Mexican children apparently error-free behavior in the acquisition of focus. My intention is to demonstrate that the correct word order in the early stages of the acquisition of Spanish is due to the fact that it is driven by topic. As topic in Spanish occurs at the beginning of a sentence, a very clear contrast is established between the early VS/SV sentences with unaccusative verbs; children start using VS order to talk about situations and SV order when they talk about the subject.

Keywords: focus, topic, unaccusatives, discourse-pragmatics

1. Introduction

From the RRG perspective, one of the most important ways in which languages differ from each other is in terms of the manner in which discourse-pragmatics interacts with the linking between syntax and semantics (Van Valin 2005). In some languages, discourse-pragmatics can affect word order. Focus related word order variation is a well-attested phenomenon observed in a number of different languages.

For Mexican Spanish, it has been demonstrated that in the unmarked case (the order attested in sentences that felicitously answer questions such as ‘*what happened?*’, ‘*what’s been happening*’), transitive clauses show an SVO order and sentences with unaccusative verbs show a VS order (Gutiérrez Bravo 2002). That is, when the focus falls on the whole sentence (all-focus) the word order is:

VS for sentences with unaccusative verbs

SV for sentences with inergative verbs or

SVO for sentences with transitive verbs.

But when the focus fall on the subject the order is:

SV for sentences with unaccusative verbs

VS for sentences with inergative verbs

VSO, VOS for sentences with transitive verbs.

I will report on the spontaneous production of 8 monolingual Mexican children (UAMI corpus). This longitudinal study was carried on at the Universidad Autónoma Metropolitana day care center #2 (CENDI 2). At the beginning of the study children were between 1.11 and 2.1, and between 3.7 and 3.10 at the end of the study. Children were recorded once a week from 8 A.M. to 12:30 P.M. while they carried out the regular CENDI program.

The utterances recorded in this study show that children produced all the orders

registered in adult Spanish: SV, VS SVO, VSO, VOS. The analysis of the context they were produced in will show that all of them can be considered grammatically correct.

2. Unaccusative verbs

2.1 VS order

First verbs (1a-d) used by all children in this study are unaccusatives (without subjects and without the clitic required by adult Spanish).¹

- | | | |
|-----|----------------------------------|--------------------------------------|
| (1) | a. (se) <i>cayó</i> (it fell) | c. (se) <i>acabó</i> (it's finished) |
| | b. (se) <i>rompió</i> (it broke) | d. <i>cabe</i> (it fits) |

Almost all intransitive verbs with an NP subject recorded in this longitudinal study are unaccusatives. In sentences like those shown in (2), all of them were uttered to announce an event that was taking or had just taken place. The NP subject surfaces post verbally, as in all-focus adult Spanish sentences with unaccusative verbs (the verb is underlined):

- | | | |
|-----|--|--------------|
| (2) | a. Ya <u>viene</u> el perro | (E. 2.3.27) |
| | is coming the dog | |
| | b. <u>se fue</u> la luz | (F. 2.41) |
| | went out the light | |
| | c. <u>se cae</u> Arturo | (D.A. 2.3.9) |
| | falls Arturo | |
| | d. no <u>vino</u> Tonatzin | (M. 2.2.21) |
| | no came Tonatzin | |
| | e. ya <u>se murió</u> la araña | (Ed. 2.3.27) |
| | already died the spider | |
| | f. ya <u>se va</u> Pedro | (E. 2.4.4) |
| | leaves Pedro | |
| | g. ya <u>llegó</u> el agua | (M. 2.5.5) |
| | arrived the water | |
| | h. <u>se cayó</u> el tractor | (F. 2.2.18) |
| | fell the tractor | |
| | i. cuidado, si no <u>va a salir</u> sangre | (T. 2.6.8) |
| | careful, if not will come out blood | |
| | j. <u>sale</u> sangre | (A. 2.9.16) |
| | comes out blood | |
| | k. me <u>salió</u> sangre | (S. 2.8.7) |
| | me came out blood | |

2.2 SV order

Contrary to what is observed in (2), in sentences, as those shown in (3), the subject surfaces before the unaccusative verb (the verb is underlined).

¹ Confirmed by questionnaire applied to parents.

- | | | |
|-----|---|--------------|
| (3) | a. <i>Marita no <u>vino</u></i> | (T. 2.3.29) |
| | Marita not came | |
| | b. <i>Dani no <u>vino</u></i> | (Dal. 2.4.7) |
| | Dani not came | |
| | c. <i>ese tronco <u>se movió</u></i> | (F. 2.3.9) |
| | that tree trunk moved | |
| | d. <i>mi mamá <u>se cayó</u> de la cama</i> | (F. 2.4.8) |
| | my mother fell off the bed | |
| | e. <i>mi mamá <u>se fue</u></i> | (M. 2.6.11) |
| | my mother left | |
| | f. <i>Fernando <u>se cayó</u> así</i> | (E. 2.3.17) |
| | Fernando fell like this | |

The context in which these utterances were produced shows that they do not answer a “what happens” type of question; like in adult Spanish, the subject surfaces pre verbally.

The VS order of utterances presented in (2) and the SV order of utterances in (3) might suggest that children have acquired the mechanism to assign focus to sentences with unaccusative verbs. Utterances in (2) show the correct VS order used in adult Spanish to assign focus to the whole sentence. In the context in which utterances in (3) were produced, adult Spanish would use SV order to assign narrow focus to the subject of the unaccusative verb.

2.3 Focus and Topic

Foci have been defined in many ways but definitions are usually centered on the distinction between old and new information, between shared and non-shared information. Studies in “theory of mind” support Schaeffer’s (2000) assertion that children’s pragmatic system is underdeveloped in that they cannot always distinguish shared and non-shared information. This, she argues, explains non-adult-like object scrambling in Dutch children. Other problems in the acquisition of Information Structure have also been observed in different languages (for example the overextension of subject omission in child Russian). Consequently, researchers of acquisition of Spanish are bound to explain the seemingly error-free behavior of children shown in (2-3).

Most of the early utterances registered in the UAMI corpus are like (1): VS (unaccusatives). They are produced to comment on an event, usually a situation that has attracted their attention. I argue that children do not make mistakes because it is not focus but topic what drives the placement of the subject in preverbal position; in all sentences in (1) the subject is not the topic.

RRG approach to information structures builds upon Lambrecht’s (1986, 87, 94, 2000) (cf. Van Valin 2005:68). The topic referent is *active* or *accessible* in the discourse, but there is a fundamental relationship between the element functioning as topic and the propositions in an utterance which the speaker assumes the hearer knows or believes (Lambrecht 1986:102, cf. Van Valin 2005:69). That is, as in the case of focus, it is hypothesized that the information presented is shared. The degree to which children under three are capable of attributing mental state content to agents is still a matter of controversy (cf. Surian *et al.* 2007). However, capable or not of distinguishing shared and non shared information, the fact to be explained is why children acquiring Mexican Spanish apparently do not have trouble learning the set of two rules that enables adult Spanish speakers to place the subject before or after the unaccusative verbs).

If following Erteschik-Shir (2007:19) topics are defined as “what a sentence is about”, it is possible to propose that children knowing what they are talking about, easily learn to place the subject preverbally which is the correct place for the topic in Spanish. Consequently, they produce grammatical sentences. The analysis of the context in which sentences in (3), (presented again as (3-bis)) demonstrates that all subjects in (3a-f), comply with this hypothesis.

- | | |
|---|--------------|
| (3-bis) a. <i>Marita no <u>vino</u></i> | (T. 2.3.29) |
| Marita not came | |
| b. <i>Dani no <u>vino</u></i> | (Dal. 2.4.7) |
| Dani not came | |
| c. <i>Ese tronco <u>se movió</u></i> | (F. 2.3.9) |
| That tree trunk moved | |
| d. <i>Mi mamá <u>se cayó</u> de la cama</i> | (F. 2.4.8) |
| My mother fell off the bed | |
| e. <i>mi mamá <u>se fue</u></i> | (M. 2.6.11) |
| My mother left | |
| f. <i>Fernando <u>se cayó</u> así</i> | (E. 2.3.17) |
| Fernando fell like this | |

It is generally agreed on that for the hearer to accept a referent as a topic, it must have been mentioned in the immediate discourse. The subjects of (3a-b) are typical topics, they have been mentioned before, these utterances are the answer to “where is Marita, where is Dani? But not all topics require previous mention. “That trunk”, in a sentence like *that trunk moved*, (3-c) can be a topic because there is a tree trunk on the scene and the child (E) is pointing at it (cf. Erteschik-Shir 2007:20). Subjects in sentences produced out of the clear blue sky can also be considered topics if they are permanent features of the world, like “the president”. “the moon” (Erteschik-Shir 2007:18). I argue that this is the case of (3d-e), “my mother” can be considered as a member of the permanent fixtures of the child’s world. The subject in *Fernando fell like this* (3f) can also function as a temporarily available topic because although it has not been mentioned before, Fernando just fell so the hearer must have the referent in mind.

As topic in Spanish occurs at the beginning of a sentence, a very clear contrast is established between:

- i. the early VS order children start using to talk about situations and
- ii. the SV order they use to talk about the subject

Children (Mexican, Dutch, Russian) might or might not be able distinguish shared and non-shared information. However, Mexican children unlike Dutch and Russian children do not make mistakes. I argue that the reason for it is that children learning Spanish can draw a very simple rule from the contrast presented in (i-ii): the NP that refers to the entity they are talking about is placed before the verb; if they are talking about an event, the subject cannot be placed in that position. All their utterances produced are grammatical, they simply do not mean what we might think they mean.

3. Transitive verbs

To further validate my hypothesis that in the stage of acquisition being analyzed in this presentation subjects in preverbal position are topics, in (4-6), I will present VSO, VOS

and clitic VS sentences registered in the UAMI corpus. I argue that these sentences support my claim that children have discovered that the preverbal position has to be occupied by a topicalized subject. Therefore, they can only place the subject in this position if it is the “topic”, if it refers to the referent they are talking about. Analysis of the context will show that the subject of the VSO sentences presented in (4) cannot be considered the “topic” of the utterance.

3.1. VSO order

In all the utterances shown in (4), the subject is not the most important issue for the child, so it is not placed in preverbal position

- | | | |
|--------|--|------------|
| (4) a. | <i>no me compró mi mamá una panterita</i> | A. 3.2.5 |
| | not me bought my mother a little panther | |
| b. | <i>me compró mi mamá un vestido lindo</i> | M. 2.11.16 |
| | me bought my mother a dress pretty | |
| c. | <i>me ponió mi mamá cremita</i> | A. 3.9.14 |
| | me put my mother cream + diminutive | |
| d. | <i>le quitó tu hija la pistola</i> | A. 2.10.28 |
| | her took away your daughter the gun | |
| e. | <i>así hace el conejo la nariz</i> | E. 2.3.27 |
| | like this does (moves) the rabbit the nose | |

The context shows that:

- i. in (3a-b), children are talking about presents they received. A and M are not talking about their mothers, they are talking about what they did or did not get.
- ii. in (3c) the child (A) burned her hand and is asked if it hurts. She is fine, cream was applied to her hand.
- iii. in (3d) A is informing about a problem that was caused *by a gun that was taken away from its owner by “your daughter”*. The passive voice of the English translation shows the daughter is not the topic.
- iv. in (3e) E points at his nose; “así” (like this) placed before the verb shows he is talking about the way the rabbit moves his nose not about the rabbit.

3.2 VOS order

VOS sentences are not very frequent in Spanish and it is claimed that those presented in studies about word order sound awkward unless a very specific context justifies them (*cf.* Gutiérrez Bravo 2002, 2005). However all sentences in (5) are grammatical and they are not awkward.

- | | | |
|--------|---|-------------|
| (5) a. | <i>ya me cortó la uña mi mamá</i> | M. 2.10.9 |
| | already me cut the nail my mother | |
| b. | <i>me cortó mi pelo mi papá</i> | M. 3.0.10 |
| | me cut my hair my father | |
| c. | <i>a mí, me cortó el pelo la señora</i> | S. 2.10.3 |
| | me, me cut the hair the lady | |
| d. | <i>me quitó mi papel mi maestra</i> | Ed. 2.4.2 |
| | me took away my paper the teacher | |
| e. | <i>tiene tierra mi zapato</i> | Dal. 2.5.17 |
| | has sand my shoe | |

In (3a-c), children are talking about having had their hair or finger nails cut not about who did it. I suggest that as “hair” and “nails” rank high in the probability of being selected by “cut”, VO surface as one unit and the subject surfaces after it. The phrase in (4d) was uttered when E was asked why he was not working. He cannot not work because “the paper was taken away from him”. What he has to report is expressed by the VO (the paper was taken away); as this is what he is talking about, “the teacher” surfaces after VO. (4e) can be explained the same way. Dal is talking about something she just found out: there is sand in her shoe, “the sand in her shoe” is what was making her uncomfortable; she is not talking about the shoe, so it surfaces after VO.

3.3 Clitic VS

In all VS+clitic sentences in (6) the subject is placed after the verb because it is not the topic of the utterance:

- | | |
|---|-------------|
| (6) a. <i>mira, lo hizo Karen</i> | (T. 2.2) |
| look it made Karen | |
| b. <i>ya la tiró mi maestra</i> | (T. 2.6.29) |
| already it threw away my teacher | |
| c. <i>le pegó Marta</i> | (S. 2.4.2) |
| him hit Marta | |
| d. <i>me mordió Zaira</i> | (E. 2.4.11) |
| me bit Zaira | |
| e. <i>me lo regaló el doctor</i> | (M. 2.6.18) |
| me it gave the doctor | |
| f. <i>me lo limpió la maestra</i> | (T. 2.6.29) |
| me it cleaned the teacher | |
| g. <i>para que no me lo robe mi maestra</i> | (S. 2.8.7) |
| so that not me it steal the teacher | |

In (6a) T is talking about the animal Karen painted which is represented by the clitic *lo* and in (6b) about the garbage the teacher threw away. In (c-d) children are telling why somebody is crying; they are not talking about who made them cry so the subject is placed after the verb. All utterances with a chain of clitics (e,f,g) are the answers M, T, S, give when they are asked about the object represented by the third person direct object clitic *lo* (it). They are taking about this object not about the subject.

- e. where did you get that *lollipop*?²
- f. what happened to your *moustache*?
- g. why are you hiding your *money*?

Once again, the subject (not being what they are talking about) is not placed preverbally.

3.4 SVO Topic or all-focus?

In Spanish, the subject surfaces before the verb in all-focus sentences with transitive verbs; when the subject is the topic it also surfaces pre-verbally. That is, both all-focus

² *Lollipop* in Spanish (*paleta*) is feminine, but it is usual for children this age not to show gender agreement in clitics.

sentences and sentences with topicalized subject show an SVO order. As all SVO utterances registered in the UAMI corpus were produced at a later stage than SV sentences (with unaccusatives) shown in (3),³ we must consider the possibility that children are starting to be aware of the fact that in adult language, the subject may surface before the verb when focus is assigned to the whole sentence. That is, the SVO order they have been employing when the subject is topicalized may also mean that the whole sentence is in focus.

Our next step is then to investigate if the subjects of all sentences in (7) have to be interpreted as the topic of the utterance.

- | | | |
|-----|--|--------------|
| (7) | a. <i>esta Ariana me prestó su agua</i> | (M. 3.6.1) |
| | this Ariana lent me her water | |
| | b. <i>este popote tiene grande el agujero</i> | (F. 3.2.4) |
| | this straw has a big hole | |
| | c. <i>Daniel no me prestó su material</i> | (E. 2,9,2) |
| | Daniel not me lent his ... | |
| | d. <i>mi mamá está haciendo la comida para comer con una cucharita</i> | (E. 2.9.2) |
| | my mother is cooking the meal to eat with a little spoon | |
| | e. <i>mi mama me compró un coche que funciona</i> | (Ed. 3.6.29) |
| | my mother me brought a car that functions | |
| | f. <i>mi mama me va a comprar una calabaza grande y una chiquita</i> | (M. 3.6.16) |
| | my mother me is going to buy a pumpkin big and one small | |
| | g. <i>mi abuelita me hace un sweater de borrego</i> | (S. 3.1) |
| | my grandmother me makes a sweater of lamb (wool) | |
| | h. <i>mi tía me tejió un sweater</i> | (A. 3.7) |
| | my aunt me knitted a sweater | |
| | i. <i>las enfermeras me dieron mi paleta</i> | (M. 2.9.12) |
| | the nurses me gave my lollipop | |

The subjects in (7a-c) qualify as topics because *Adriana*, *Daniel* and the *straw* are in the scene of the conversation and the speakers point at them. The subject in (7d,e,f) (my mother) can be considered like “my mother” in (3e-f) as permanent topic. After confirming that the family of children who produced (7g-h) (S and A) was a typical Mexican “extended” family, subjects (my grandmother and my aunt) could also be considered as permanent topic, but *las enfermeras* (the nurses) in (7i), at least, in this school, definitely cannot qualify as such.

However, sentences (7d,e,f) show a clear contrast with sentences (3e,f) where the context shows that children are talking about their mothers. Sentences (d,e,f) were uttered “out of the clear blue sky”, the subject is not present like in (7a-c) and a closer analysis show that they are not talking about their mother, they are informing other children about something that happened, is happening or is going to happen. (7d) was produced when E. saw a girl playing with spoons pretending she was cooking; Ed produced (7e) when another child refused to lend him a toy, (7f) was uttered when M was not allowed to cut pumpkins images the way she wanted.

Although subjects in (7g,h) could qualify as permanent topics, the context shows that children are not talking about *mi abuelita* or *mi tía*. Other children are talking about their sweaters, S and A talk about theirs too, those that had been or were being knitted for them. The context also shows that the subject in (7i) is not a topic, it is not the nurses M is talking

³ SV sentences with unaccusative verbs in (3) were first registered at 2.3.9 ; first SVO was registered at 2.9.

about. She had been taken to be examined by the school doctor, when she gets back to the classroom she shows the lollypop to all the other children and tells them it was given to her by the nurses.

We assume that it has not been yet determined the degree to which small children are capable of distinguishing shared and non-shared information. However, if we adopt a pragmatically derived definition of focus that states that "the focal information in a linguistic expression is that information which is relatively the most important or salient in the given communicative setting, and considered by the speaker to be the most essential [...]" (Dik 1997:326 *cf.* Erteschik-Shir 2007:38) we can propose that sentences shown in (7d-i) show that children are learning to use SVO order to assign focus to the whole sentence. The most important or salient information they are communicating is not expressed in these six SVO sentences by a single syntactic constituent but by the whole sentence. Consequently they suggest that these young speakers have learned that in Spanish all-focus sentences with transitive verbs require SVO order.

But before ending, I want to mention that it has been suggested that all-focus sentences do have a topic, an implicit topic that indicates the here and now of the discourse (*cf.* Erteschik-Shir 2007: 16-17). As all the sentences in (7d-i) can be interpreted as being directly related with what is happening or has just happened before they were uttered, it is possible to analyze them as all-topic sentences. It can then be considered that topic is what leads Spanish speaking children to all-focus sentences.

4. Final remarks

I have claimed that children do not make order mistakes in the early stages of the acquisition of Spanish because they get a transparent message. Children start producing unaccusative verbs which appear in Spanish in two orders that are clearly differentiated. I have proposed that they draw very simple rules:

- i. VS order is used to talk about situations.
- ii. SV order is used when speakers are not talking about a situation but about an object or a person.

Consequently, what they are talking about (the topic) goes before the verb. To further validate this claim I presented VSO, VOS, cliticVS utterances to show that when children are not talking about the subject they place it post verbally. That is, all along they utter sentences that can be considered grammatical in the context they are produced.

SVO sentences are not usually produced at the very early stages. There are sentences showing this order in which the subject does not seem to be the topic. I claim that these sentences suggest that children have grasped that this order is used not only to topicalize subjects, but also when the most important information is expressed by the whole sentence. I have called the attention to the fact that if we assume that all-focus sentences have a topic, in Spanish, all-topic sentences may lead Mexican children to all-focus sentences.

We have not considered inergatives in this presentation because our corpus only contained one SV/VS example.⁴ However, these sentences do not contradict what has been presented here. At the age of 2;3.27 one child produced *están llorando los bebés* (the babies are crying) when he was asked about a noise, but he placed the subject before the verb when he meant to talk about the subject. The child uttered the sentence *Marita también lloraba* (Marita was also crying) a couple of hours after he had produced the VS sentence with the same verb (llorar-to cry).

⁴ All inergative verbs were used without subjects.

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Arguments, adjuncts and PP types in RRG

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Abstract

Following the Jolly's work (1993) on preposition assignment, Role and Reference Grammar (Van Valin & LaPolla, 1997; Van Valin, 2005) assumes three kinds of prepositional phrases (PPs) in terms of their relations and status within the sentence they appear: PPs which function as oblique core arguments; PPs which have the status of adjuncts, and PPs functioning as argument-adjuncts in the core. Following this general schema and some additional proposals from Ibáñez (2009), this paper outlines a more fine-grained characterization of PPs functions taking into account the relation they can have to particular predicates in terms of three main features: a) the semantic nature of the participant they code (+/- argument), b) the syntactic behavior they have (+/- controller of pivots) and c) the nature of their prepositions (+/- predicative). The main goal is to develop an expanded system of PP types by considering these features as part of three different and strickly separate levels (the semantic, the syntactic and the intra-syntagmatic ones), that, nevertheless, are closely correlated. The combination of the three features yields 8 logical types of PPs that code different types of arguments and adjuncts. The system is illustrated with data from Spanish.

Keywords: *argument-adjunct distinction; PP types on RRG; Syntax-semantics interface.*

INTRODUCTION

Following the Jolly's work (1993) on preposition assignment, Role and Reference Grammar (Van Valin & LaPolla, 1997; Van Valin, 2005) assumes three kinds of prepositional phrases (PPs) in terms of their relations and status within the sentence they appear: 1) PPs introduced by predicative prepositions, which contribute to the semantics of the argument they license, and function as peripheral modifiers of the core (i.e. adjuncts); 2) PPs introduced by non-predicative, *usually invariable*, prepositions, which do not license its arguments (i.e. verbal argument), and serve as oblique core arguments; 3) PPs introduced by a *variable* preposition introducing a verbal argument, such a preposition semantically contributes to its argument and to the clause, and have the status of argument-adjuncts in the core. These three PP types are exemplified in (1):

- (1) a. *John walks everyday **in the park**.*
- b. *Peter gave the book **to Mary**.*
- c. *Leslie put the book **in /on behind/under the box**.*

Following this general schema and some additional proposals from Ibáñez (2009), this paper outlines a more fine-grained characterization of PPs functions taking into account the relation they can have to particular predicates in terms of three main features: a) the semantic nature of the participant they code (+/- argument), b) the syntactic status they have (+/- core) and c) the nature of their prepositions (+/- predicative). The main goal is to develop an expanded system of PP types by considering these features as part of three different levels, in descriptive terms (the semantic, the syntactic and the intra-syntagmatic ones), that, nevertheless, are closely correlated. The combination of these

three features yields 8 logical types of PPs that code different types of arguments and adjuncts. One type, however, is ruled out, because, it don't make sense in functional terms; this is, a PP that codes an adjunct in the periphery but is introduced by a non-predicative preposition. The system, which in first hand, is merely a descriptive one, is illustrated with data from Spanish.

DISTINGUISHING THE SEMANTICS AND SYNTAX OF ARGUMENT STRUCTURE

A semiotic frame for the definition of the notions of argument and adjunct

The notions of argument or actant, on the one hand, and that of adjunct or circumstant, on the other hand, have had a lot of different connotations in the last 50 year or so, since they were first proposed, in a more defined way by Tesnière in 1959. The dichotomy, that has been very useful in the modern syntactic theory, has been used, sometimes, to refer to a syntactic distinction, and sometimes to refer to a semantic one. It is the case, however, that most theories use the distinction in a syntactic way, and, no matter if they are formalist or functionalist, they usually work with a very reduced notion of what it is a lexically required participant. That is, most theories just take in consideration the verb participants that are strictly needed for producing or generating the clause, the ones that need obligatory syntactic coding, and in most cases, they just take into account the ones that must have a NP coding, and once the lexical semantics has provided, what is usually called a 'copy' of the participant, the rest is done on the syntax. In this way, the very identity of a participant as argument is a syntactic one.

What distinguishes RRG from other theories is that, as a real functionally driven framework, it takes semantics as a starting point for the analysis of clause structure. As it is stated in Van Valin (2005), the layered structure of the clause is based on two fundamental semantic contrasts: between the predicate and non-predicating elements, on the one hand, and among the non-predicating elements, between arguments and non-arguments, on the other hand. That is, the concept of argument is treated like a semantic notion, a one that, within the same RRG framework, correlates with that of the elements that belong to the core. This last one, the notion of core element is the one which is syntactic.

Starting from this general frame, I want to propose that the notion of argument has to be maintained as a pure semantic one, and that it has to be considered in a more broad semiotic way, in which language is a communication mean and it is used as an interaction artifact. I take communication to be an interactive process which serves to accomplish the goal of cooperation among the members of a community. Cooperation takes place in the implementation of shared actions, which ultimate goal is to satisfy the biological, psychological, cultural and social needs of the members of the community. In this context, to communicate implies to share projective and retrospective common representations about reality. These shared representations are founded in cognitive and sensory-motor schemas or frames (Arbib, 1987; Cervantes-Pérez, 1985) about states of affairs (situations, events, actions, processes, etc.) that are relevant for the community. These cognitive schemes are, at the same time, the product, the means and the base of the cooperative and communicative interaction. They are the basis for the elaboration and use of the linguistic schemas that we use in the dialogical construction of concrete instances of such representations in the interactive process.

Following this, a clause is the basic linguistic artifact for the representation of state of affairs and the communication of these representations. But the important thing here is to consider that the linguistic representation that the clause entails is also a

dialogic construction between the two interactors in the communicative process. The clause is a linguistic device that has to be generated and interpreted in a specific context, and as such, it is not only a product of the emission process, but it is the result of the interaction between the speaker and the hearer. In this way it is a shared construct.

That is to say that if a certain participant of the clause is an argument, or it is not so, that is, it is and adjunct, should be a function of the semantics of the verbal predicate that is the nucleus of that clause, regardless of the syntactic properties of the participant in that particular clause. What I mean with this, is that regardless of what shows up in the syntax when a sentence is being produced, an argument is a semantic feature that plays its role in the interpreting of that sentence. That is, an argument is a participant that has a determined role in the state of affects denoted by a certain predicate and that is taken in consideration by the hearer, or interpreter, in constructing, along with the speaker in the communication process, a shared mental representation of the denoted state of affairs. That means that, if a participant is not explicitly coded, and it is an argument, the interpreter has to find a possible referent for it in the discourse context; this could be in the textual context, in phoric terms, or it could be in another semiotic context, as the situational one or the one that implies the signaling of a participant reference by means of gestures or any other semiotic means.

In this context, one can think of the notion of argument as a pure semantic or lexical one, and in this sense, syntax does not play any role in determining the status of a participant as argument or as adjunct.

The core and the role of syntax

What is then, the role of syntax? As it has been said repeatedly in the literature, the function of syntax is to signal the relative semantic and pragmatic hierarchy of the arguments of a given predicate. That hierarchy shows up in the clause as the formal and behavioral privileges that each of the arguments have and that permit them to be more accessible or prominent for the communicative goals, as when in a certain language, in a certain construction, in the active voice, for example, an argument is the default controller or pivot, or it is coded as an unmarked phrase, or it appears in a certain word order, all of these characteristics being a way of signaling a conceptual and/or a discourse saliency; or when by means of an argument manipulation construction, other argument gets the 'opportunity' to have one or several of those privileged behaviors. These differences are captured in a framework as RRG in the distinction between being an argument on the core or being a peripheral participant. Although this distinction is clearly not a diacritic one but rather a gradient one, because not all central arguments behave in the same way, and not all peripheral participants do so, this distinction permits to capture the main differences among those participants that in a certain language can have a certain amount of privileges and those that do not. Following the claim that the notion of argument is strictly a semantic one, the syntactic properties of arguments should be considered independently. That is to say that, although it is expected that all arguments should be core arguments, not all semantic arguments need to be so, nor all core participants need to be arguments.

As Van Valin and LaPolla (1997) proposes, one of the main criterion for determining the core status of clause participants is their possibility of being controllers and/or pivots, that is, the possibility of being privileged syntactic arguments (PSA). This notion, as proposed in RRG, is an alternative for categories like subject and direct object that, accordingly to numerous studies, are not universally valid. PSA refers to each argument that, in a particular construction, in a particular language, has access to the

majority of the most important syntactic behaviors, prominently, to the controller and pivot functions. A controller is the syntactic element that in a given sentence controls the reference of an omitted element in a coordinated or a subordinate clause. A pivot is the function that bears the omitted element. Other important characteristics of PSAs that should be considered for establishing the core status of a XP are obligatory syntactic coding, privileged word order, direct case marking, agreement control, among others. It is important to consider that the PSA functions can be split among the various arguments in the clause. In this way, for example, while in a given sentence an argument can control the verbal agreement, another one can control the reference of an omitted element in a subordinate clause.

What are the arguments of any predicate in any given language is an empirical question. Detailed discourse and context analysis of argument structure manifestations are needed for stabilising that. All the same, if those arguments have PSA properties in the specific constructions they appear in, and if in that sense they belong to the core of those clauses, it is also a matter that has to be proved case by case. Van Valin and LaPolla (1997) states that there are languages which allow all semantic arguments to have some PSA properties, and that there are other languages which only permit certain participants, for example, those which are coded as direct core arguments, to do so; that has to mean that in those languages oblique arguments should not be in the core. Nevertheless, there are languages, and Spanish is one of them, as I will show, in which some PP arguments are in the core and other ones are not.

So, maintaining the semantic identity of the notion of argument, one can think of syntax just as a constructional based hierarchy of accessibility to formal ways of indicating conceptual and pragmatic prominence. Again, not all of the arguments of a predicate have to be in the core in all the constructional options of that predicate. One argument that can be in the core in one construction, can be left out of the core because in one particular communicative context it does not have a prominent role, although, as an argument, it has an obligatory role in the interpretive process.

Clearly this is the case in argument manipulated constructions. For example, in the passive construction in a language like English, the agent argument is claimed to be in the periphery (Van Valin and LaPolla, 1997) despite being a macro role assigned participant. But even more, one can think in the case of certain participants, which in semantic terms are arguments, but not always are coded as core elements of the clause. This is the case of participants as the ones in (2):

- (2) a. *Pedro habló con María (en Francés)*
 ‘Pedro talked to María in French’
- b. *Mauricio le declaró su amor a Tere (con un gesto)*
 ‘Mauricio declared his love to Teresa with a gesture’
- c. *Pedro habla francés perfectamente*
 ‘Pedro speaks French perfectly’
- d. *El gesto del hombre lo declaró todo*
 ‘The man’s gesture declare it all’

En francés y *con un gesto* coded semantic participants that in Ibáñez (2008) are called, respectively, language and code. They are claimed to be part of an enhanced frame that serves as the basis for defining the argument structure of saying verbs. They are more or less implied by particular items in particular constructions, but they are semantic participants that, in general, can be focalized by this type of predicates. As can be seen in the examples in (2a) and (2b), they can be coded as PPs, but in this case they are not

obligatory, and they are likely to be peripheral participants, that is, arguments in the periphery. Nevertheless, they can be coded as subject and direct object in other direct constructions, as in (2c) and (2d), and in these cases, they are core arguments.

Besides this, the independent identity of the argumental status and the core status of a participant is exemplified by the case of elements in the clause that are not semantically required by the nucleus predicate, but as Mora (2009) shows, in certain constructions they do have certain interesting behaviors that put them in the core. This is the case of some manner, temporal and locative PPs as the ones in (3a-b-c):

- (3) a. *La mujer viste con elegancia*
 ‘The woman dresses with elegance’
 b. *María actuó en el momento adecuado*
 ‘María acted in the right moment’
 c. *El Puente fue construido en el lado este de la ciudad*
 ‘The bridge was built in the east side of the city’
 d. **La mujer viste*
 ‘The woman dresses’
 e. **María actuó*
 ‘María acted’
 f. **El Puente fue construido*
 ‘The bridge was built’

At least, as (3d-e-f) show, these PPs are obligatory for the grammaticality of these clauses. That is, they are syntactically required and that put them in the core.

So, to sum up this part, the argument status and the core status of a clause participant are independent. The only obligatory syntactic value that a participant related to a certain predicate has to have to be an argument is the intrinsic possibility to be coded as a core participant at least in one of the constructions in which that predicate can occur (its diathesis), but clearly, it can be coded as a non-core participant in other constructions.

A SYSTEM OF THREE LEVEL FEATURED COMBINATION

Besides its semantic and syntactic status, there is another type of information needed to fully establish the identity of the PPs. Since the work of Jolly (1993), the distinction between predicative prepositions and non-predicative prepositions has been implemented in RRG for establishing the different functions that the PPs can play in relation to different predicates; basically: to permit the coding in a clause of non-argument participants or, in the case of arguments, to signal if they are oblique core argument (those which are introduced by a non-predicative adposition) or if they are argument-adjuncts in the core (those which are introduced by a predicative adposition).

Now, combining this kind of categorical information along with the semantic and syntactic values of the PP participants of a clause, the three taken as different informational levels, one can arrive to a system of 8 logical types of PPs. The values or features for each level can be posited as follows: a) taking the semantic nature of the participant they code, a PP can be (+/- argument); b) in reference to the syntactic status they have, they can be (+/- core); and c) taking into account the nature of their prepositions, they can be (+/- predicative).

The combination of features gives us the next set of possibilities:

- | | |
|-----------------------------|---|
| 1. (+) Argument | (semantic level) |
| (+) Core | (syntactic level) |
| (-) Predicative preposition | (intrasintagmatic or categorical level) |
| 2. (-) Argument | |
| (-) Core | |
| (+) Predicative preposition | |
| 3. (+) Argument | |
| (+) Core | |
| (+) Predicative preposition | |
| 4. (+) Argument | |
| (-) Core | |
| (-) Predicative preposition | |
| 5. (+) Argument | |
| (-) Core | |
| (+) Predicative preposition | |
| 6. (-) Argument | |
| (+) Core | |
| (+) Predicative preposition | |
| 7. (-) Argument | |
| (+) Core | |
| (-) Predicative preposition | |
| 8. (-) Argument | |
| (-) Core | |
| (-) Predicative preposition | |

Of the eight logical possibilities of PP types, only the last one, the one that implies (-argument,-core,-predicative) is ruled out by functional principles: there is no way, it seems, in which a semantic adjunct, with no core privileges, can appear introduced by a non-predicative preposition. In the next section, Spanish examples of each of the other seven types are provided, along with their type name.

Oblique core argument

- | | |
|-----------------------------|--|
| (+) Argument | (semantic level) |
| (+) Core | (syntactic level) |
| (-) Predicative preposition | (intra-sintagmatic or categorical level) |

This is the case of the canonical oblique core arguments in RRG terms; that is, Semantic arguments that are coded as a PP introduced by a non-predicative preposition. Van Valin and Lapolla (1997) and Van Valin (2005) states that the clearer example of this kind of PP is that of the recipient argument of transference verbs in languages like English:

- (4) *Tony gave the book to Peter*

The dative arguments of this kind of verbs in Spanish have a different behavior, the most important of them being the fact that they can be, and usually are, duplicated by a kind of agreement mark, namely the clitic *le*:

- (5) a. *Luisa le dio el libro a Rogelio*
 'Luisa gave the book to Rogelio'

- b. *Luisa les dijo la noticia a sus hermanos*
 ‘Luisa told the notice to his brothers’

As pointed out before by Belloro (2007), given this and other criteria, they can be seen as some kind of direct core argument. Leaving aside this issue, in other works (Ibáñez, 2005, 2009) I show that in Spanish the goal and source arguments of intransitive verbs of motion and the goal of change of place verbs, as the ones in the examples of (6), are also oblique core arguments:

- (6) a. *Juan fue al cine*
 ‘John went to the movies’
 b. *Tere salió de la ciudad*
 ‘Teresa went out of the city’
 c. *Adriana puso el vaso en la mesa*
 ‘Adriana put the glass on the table’

Basically this is so, because: 1) They are semantically required by the predicates they appear with; 2) although they seem to be ‘optional’ in some contexts, they strongly tend to appear coded (70% to 90%); 3) they can control pivots in coordinated clauses and in non-finite final subordinate clauses; and 4) they are mostly coded with what clearly are, in terms of frequency at least, canonical prepositions: *de*, with source verbs as *salir* ‘to get out’ and *partir* ‘to leave’; *a* with goal verbs as *ir* ‘to go’ and *venir* ‘to come’, and *en* with change of place verbs as *poner* ‘to put’ and *colocar* ‘to place’; and more important, these prepositions are predictable from specific structural contexts in the LS of predicates.

All the same, the obligatory PPs of what are usually called *suplementos* in the Hispanic Linguistic literature (Alarcos, 1968, et. al.), as the ones in (7), are also oblique core arguments. Besides being obligatory, they are semantically required and are introduced by non-predicative prepositions. These are not, however, case marks derivable from specific structural contexts; they are in some way idiosyncratically imposed by the verb form.

- (7) a. *Juan carece de oportunidades.*
 ‘John lacks opportunities’
 b. *Juan aspira a un buen empleo.*
 ‘John aspires to a good job’
 c. **Juan carece.*
 ‘John lacks’
 b. **Juan aspira.*
 ‘John aspires.’

Peripheral adjuncts

- (-) Argument
 (-) Core
 (+) Predicative preposition

These are the canonical peripheral clause participants. From the specified features we can see that, these are not semantically required by the predicates they appear with, i. e. they are not arguments, so they must be adjuncts. All the same, they cannot function as controllers and must be out of the core, that is, in the periphery. Finally, their

preposition is predicative and, as such, it licenses the presence of the participant in the clause. We can label them peripheral adjuncts PPs.

The more straight forward example of this type of PP are the temporal and locative adjuncts that function as settings of the state of affair denoted by the predicate, as the ones in (8), from Van Valin (2005):

- (8) a. *John baked a cake **after work***
 b. *John baked a cake **in the kitchen***

(9a) and (9b) show similar examples in Spanish. Examples in (9c) and (9d) show that, in effect, this kind of PPs cannot function as controllers, and that for that, and other criteria, they cannot be in the core.

- (9) a. *Marta corría **en el parque** para ejercitarse*
 ‘Marta ran in the park for exercising’
 b. *Julia cenó **en la sala***
 ‘Julia had dinner in the leaving room’
 c. *Marta_i corría **en el parque**_j y _i/*_j se veía bien*
 ‘Marta ran in the park and (he/it) looked nice’
 d. *Julia_i cenó **en la sala nueva**_j y _i/*_j se ve bien*
 ‘John had dinner in the new living room and (he/it) looks nice’

Van Valin and Lapolla (1997) proposes that the prepositions that introduce these PPs are two place predicates, one of them being the whole core and the other one the NP which the preposition introduces to the clause. A standard RRG representation for (8a) is the logical structure (LS) in (10):

- (10) **be-after'** (work, [[**do'** (John, Ø)] CAUSE [BECOME **baked'** (cake)]])

Nevertheless, Ibáñez (2009) shows that there are peripheral adjuncts that can have different LSs than this one, but, for reason of space, I will leave this issue out of this work.

Argument-adjunct in the core

- (+) Argument
- (+) Core
- (+) Predicative preposition

This specification of features implies that: 1) the participant is an argument, that is, it is licensed by the predicate semantics; 2) it is in the core; and 3) its preposition is predicative, and this is in fact what differentiates this type of PP from the standard oblique core argument.

As proposed by Van Valin (2005), these PPs can be labeled argument-adjuncts in the core. Following this, Ibáñez (2009) states that in Spanish this type is exemplified by the goal PPs of intransitive motion and change of place verbs, but only when they are introduced by non-canonical prepositions, because, as I mention above, when they are introduced by the canonical ones, they are oblique core arguments. The non-canonical prepositions add a semantic specification to the referent of the verbal argument, and that is why they are predicative; but, as shown in Ibáñez (2009), both the argument and the

preposition variability, are lexical features of the predicate. Besides this, these PPs can function as controllers of pivots, and this is what allows us to claim they are in the core.

- (11) a. *En la mañana, Juan_i fue **para la casa nueva**_j y _{i/j} se veía bien.*
 ‘In the morning, John went to the new house and (he/it) looked nice.’
 b. *Juan_i puso un pez_h **dentro de la pecera nueva**_j y _{*i/h /j} se ve bien.*
 ‘John put a fish inside the new fish bowl and (it) looks good.’

Argument in the periphery

- (+) Argument
- (-) Controller
- (-) Predicative preposition

As expected from the iconic principle in the semantic-syntactic correlation, semantic arguments of the verb are canonically in the core, that is, they ‘naturally’ have access to some syntactic privileges that put them apart from the canonical adjuncts, which in principle do not have those privileges and are clearly in the periphery. Nevertheless there, are languages in which only the direct arguments are in the core, that is, all oblique arguments seem not to have control or pivot functions or any other type of syntactic privileges.

Other well established case of this type, is the agent PP of passive construction in languages like English, in which the implementation of the argument manipulation constructional scheme causes the agent to lose all of its syntactic privileges, and as a result it cannot project as a core argument.

As mentioned before, some possible cases of this PP type in Spanish, which does not involve a voice process, are the ‘language’ and ‘code’ participants of verbs of saying illustrated in (1a) and (1b), and repeated here as (12a) and (12b).

- (12) a. *Pedro habló con María (**en Francés**)*
 ‘Pedro talked to María in French’
 b. *Mauricio le declaró su amor a Tere (**con un gesto**)*
 ‘Mauricio declared his love to Teresa with a gesture’
 c. *Pedro habla **francés** perfectamente*
 ‘Pedro Speaks French perfectly’
 d. ***El gesto** del hombre lo declaró todo*
 ‘The man’s gesture declare it all’

As I said before, these PPs are clearly optional and peripheral, but they code participants that are lexically required, i. e. arguments, as it is shown by the fact that they can be coded in core functions, as in (12c) and (12d).

Other example of this PP type is the case of locative arguments of verbs that intrinsically, in semantic terms, require four arguments: a locative, an effector and two theme, which can be coded as two syntactically independent phrases, one as a NP and the other as a PP (13a), or as one single NP with plural number (13b). The examples are in (13):

- (13) a. *El presidente reunió a los gobernadores con los alcaldes (**en el salón principal**)*
 ‘The president gathered the gubernators with the mayors in main hall’
 b. *El presidente reunió a los gobernadores y a los alcaldes (**en el salón principal**)*
 ‘The president gathered the gubernators and the mayors in main hall’

- c. *El salón principal reúne a los gobernadores y a los alcaldes*
 ‘The main hall gathers the gubernators and the mayors’

The important thing about this kind of verbs, among which one can list items like *juntar*, *agrupar*, *incluir* etc., is that their locative argument can be coded as a PP introduced by *en*, as it is expected from the structural context **be-at**’(x,y), which is part of *reunir* LS -probably, something like [**do**’(w, Ø)] CAUSE [BECOME **be.at**’(z, [**be.together**’ (x,y)))] -, or it can be coded as the subject of the clause. In this last case, it is a core argument, but in the former it is a peripheral argument, because is optional, and it cannot function as controller, as the example in (14) shows:

- (14) *El presidente_i reunió a los gobernadores con los alcaldes en el salón principal_j y_{i/*j} se veía bien*
 ‘The president gathered the gubernators with the mayors in main hall and (he/it) looked nice’

Argument-adjunct in the periphery

- (+) Argument
- (-) Core
- (+) Predicative preposition

This specified combination of features implies that this type of PP codes an argument participant that is being introduced by a non-canonical preposition, and as a result it does not have core properties. In this way, they are different from the cases of argument-adjuncts in the core I just presented in 3. 3. Compare the examples in (15):

- (15) a. *Israel_i llegó al edificio_j y_{i/j} estaba sucio*
 ‘Israel arrived at the building and (he/it) was dirty’
 b. *Julio_i llegó hasta el edificio_j y_{i/j} estaba sucio*
 ‘Julio arrived at the building and (he/it) was dirty’
 c. *Lola_i salió a la calle_j y_{i/j} estaba sucia*
 ‘Lola went out to the street and (she/it) was dirty’
 d. *Marisa_i salió para la cabaña_j y_{i/*j} estaba sucia*
 ‘Marisa went out to the cabin and (she/it) was dirty’
 e. *Ramón_i partió al bosque_j y_{i/j} estaba sucio*
 ‘Ramón left to the wood and (he/it) was dirty’
 f. *Toño_i partió para el bosque_j y_{i/*j} estaba sucio*
 ‘Toño left to the wood and (he/it) was dirty’

In the one hand, the clauses in (15a) and (15b) are headed by a predicate that inherently requires and focalized a goal argument. This last one can be coded as a PP introduced by a canonical non-predicative preposition, *a* in (15a) or by a non-canonical predicative preposition, *hasta* in (15b). In both cases the goal argument can be controller of pivot in coordinated clauses, and for that, we can say it is in the core. The relative PPs are argument-adjuncts in the core. In the other hand, the PPs in (15c) and (15e) are, as it is proposed in Ibáñez (2005), argument participants, even though the predicates they appear with inherently focalize a source argument. The goal argument belongs to an enhance movement frame that permits that verbs as *salir* ‘to go out’ and *partir* ‘to leave’, frequently get coded with that argument. Even in corpus data, *salir* appears more with a goal (at least 55% of the cases) than with an explicit source. This is why with

these predicates, the goal can still function as core argument. Nevertheless, when the goal of *salir* and *partir* are coded with non-canonical prepositions, as in (15d) and (15f) they cannot function as controllers, and this signals they are not in the core. One can say that, with these predicates, the goal is an argument but it is not syntactically focalized. So in these cases, goals are argument-adjuncts in the periphery.

Adjuncts in the core.

- (-) Argument
- (+) Core
- (+) Predicative preposition

This PP type codes what, from the specification of features, is clearly an adjunct participant, that is, a non-semantically required participant. Nevertheless, the (+) core feature indicates that, against what is expected from adjuncts in direct constructions, this kind of PPs shows some important syntactic properties that give them a core status. As it was exemplified before, this is the case of some manner, temporal and locative PPs as the ones in (3), repeated here as (16):

- (16) a. *La mujer viste **con elegancia***
 ‘The woman dresses with elegance’
 b. *María actuó **en el momento adecuado***
 ‘María acted in the right moment’
 c. *El Puente fue construido **en el lado este de la ciudad***
 ‘The bridge was built in the east side of the city’
 d. **La mujer viste*
 ‘The woman dresses’
 e. **María actuó*
 ‘María acted’
 f. **El Puente fue construido*
 ‘The bridge was built’

The PPs in (16a-b-c) are syntactically obligatory for the grammaticality of these clauses, as can be seen from the examples in (16c-d-e). Besides this, as Mora (2009) shows, these PPs have some order and movement restrictions: They basically appear in post-verbal adjacent position (as in 16); they also can occur before the verb, but only if the clause subject also moves to a post-verbal position, as in (17a), otherwise the PP movement renders the ungrammaticality of the clause (17b-c). Nevertheless, this is not a restriction for free adverb adjuncts, as Mora also shows, in examples like those in (17d-f):

- (17) a. ***Con elegancia** viste la mujer*
 ‘The woman dresses with elegance’
 b. ??***Con elegancia** la mujer viste*
 ‘The woman dresses with elegance’
 c. ?? *La mujer **con elegancia** viste*
 ‘The woman dresses with elegance’
 d. *Pedro se afeita **cuidadosamente***
 ‘Peter shaves carefully’
 e. ***Cuidadosamente** Pedro se afeita*
 ‘Peter shaves carefully’

- f. *Pedro cuidadosamente se afeita*
 ‘Peter shaves carefully’

Other diagnostics that Mora proposes for establishing the core status of these PPs are negation scope and extraction possibility. For reasons of space, I will leave the pertinent examples out of this presentation. What does need to be said is that the PPs in (16) are not semantically required, in lexical terms, by their respective nucleus predicates. There are two options for explaining their obligatory character: either, 1) they have to appear because some kind of condition about the use of syntactic templates is in operation, something like ‘two argument predicates need to be projected in a syntactic template with two units, whatever they are projecting both of their arguments, which would explain (16a-c) but not (16b), or 2) as Goldberg and Ackerman (2001) propose, those PPs are imposed by pragmatic conditions, in terms of the relative communicative relevance of the information that is being coded. I will leave aside this question for future studies.

Adjuncts-arguments in the core

- (-) Argument
- (+) Core
- (-) Predicative preposition

This kind of PP can be illustrated in Spanish with the ones that appear in a type of dative construction. As has been pointed out before by Gutiérrez Ordóñez (1978) and Demonte (1994), among others, in Spanish there are two types of dative constructions: 1) one that is formed with PPs that code recipient participants semantically required by the nucleus predicates, that properly are core arguments, as the ones in (18a-b); and 2) one that goes with PPs that code participants that are not inherently arguments of the verbs they appear with, as the ones in (18c-d):

- (18) a. *Susana (le) dio un regalo a María*
 ‘Susana gave a gift to María’
 b. *Dulce (le) ofreció un vaso de vino a Julio*
 ‘Dulce offered a glass of wine to Julio’
 c. *Mario le pintó la casa a Rosa*
 ‘Mario painted Rosa her house’
 d. *Ramiro le trabajó dos años al Sr. Rodríguez*
 ‘Ramiro worked for Mr. Rodríguez Turing two years’
 e. **Mario pintó la casa a Rosa*
 ‘Mario painted Rosa her house’
 f. **Ramiro trabajó dos años al Sr. Rodríguez*
 ‘Ramiro worked for Mr. Rodríguez Turing two years’

As it can be seen from these last examples (18e-f), the presence of the PP depends on the co-presence of the clitic *le* (18c-d), while this is not the case on the former examples (18a-b). Nevertheless, they alike with respect some core behaviors, as both types can be controllers of pivots in non-finite subordinate clauses:

- (19) a. *Juan_i dio un libro a Pedro_j para __j leer*
 ‘John gave a book to Peter to read.’
 b. *Juan_i le hizo un traje a Pedro_j para __j usar en la fiesta*

‘John made Peter a suit to wear it at the party.’

Ibáñez (2003) argues that, as in this last construction the presence of the PPs depend on the co-presence of the clitic *le*, it is a kind of applicative construction; that is, a one where the participant coded by the PP, a semantic adjunct, is being introduced as a core argument by means of the clitic *le*. In this sense, this type of PP is an adjunct in the core, but as its preposition *a* is not-predicative, but rather it is imposed by the presence of an argument manipulation constructional scheme, it is really and adjunct-argument in the core.

CONCLUSIONS

Summing up, I have tried to show that considering the semantic and syntactic status of a PP in a separate way, that is, on the one hand, its character as argument or adjunct, and in the other hand, its character as core or as peripheral participant, plus the considerations of the predicative or non-predicative value of its preposition, can render a productive descriptive system for different types of PPs that can exist in a language like Spanish. More detail typological work is needed to establish is the categories that arise from the combination of the proposed features are useful for the description of the PPs in other different languages.

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An account of selection restrictions within a conceptual framework: Its relevance for Role and Reference Grammar.¹

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0. Abstract

Selection restrictions have been a much debated issue since their first appearance in Generative Grammar (Katz & Fodor 1963). Within Role and Reference Grammar (RRG; Van Valin & LaPolla 1997; Van Valin 2005), selection restrictions are not expressed directly in logical structures but are stipulated on an *ad hoc* basis, since there is not yet a lexico-semantic representation that provides a full decomposition of these aspects of meaning. We sustain that a solution may be found if the current RRG semantic representations stored in the lexicon are linked to conceptual information stored in the ontology of a lexico-conceptual knowledge base such as FunGramKB (Periñán & Arcas 2004, 2005, 2007; Mairal & Periñán 2009, 2010; Periñán & Mairal 2009). The goal of this paper is to explore how selection restrictions can be easily incorporated in the ontology in the form of conceptual schemata like thematic frames (TFs) and meaning postulates (MPs). These, in turn, will be connected to the RRG logical structures via conceptual logical structures, which are abstract representational mechanisms that bridge the gap between the cognition-oriented TFs and MPs in the ontology, and the particular lexico-syntactic idiosyncrasies represented in logical structures (Periñán & Mairal 2009). As for selection restrictions, they are stated in TFs and MPs when they exert constraints typically related to the cognitive situations displayed by the events. The domain of POSSESSION is employed to illustrate this kind of constraints within an ontology.

Keywords: selection restrictions, FunGramKB, Role and Reference Grammar, possession.

1. Introduction

Selection restrictions have been a much debated issue since their first appearance in Generative Grammar in Katz & Fodor (1963). Many scholars have dealt with them from a variety of theoretical stances: from syntactic perspectives, for example, Chomsky (1965), to more semantic approaches, such as Weinreich (1966) and Coseriu (1967), as well as cognitive ones, like Taylor (1989), to name just a few. Within Role and Reference Grammar (RRG; Van Valin & LaPolla 1997; Van Valin 2005), selection restrictions are not expressed directly in logical structures but are stipulated on an *ad hoc* basis. For example, there is a general lexical principle to account for the fact that the first argument in the logical structure of verbs of perception, cognition, propositional attitude, emotion and internal experience must be a sentient, animate entity (Van Valin & LaPolla 1997: 156). This is certainly so because there is not yet a lexico-semantic representation that provides a full decomposition of all these aspects of meaning, since the idea is that “the

¹ Financial support for this research has been provided by the Spanish Ministry of Science and Innovation, grants HUM2007-65755/FILO and FFI2008-05035-C02-01. The research has been co-financed through FEDER funds.

RRG semantic representation would ultimately have to be given a full interpretation in a formal semantic theory” (Van Valin 2005: 50).

The goal of this paper is to present selection restrictions from a conceptualist framework such as the lexico-conceptual knowledge base *Functional Grammar Knowledge Base*² (FunGramKB henceforth; Perinián & Arcas 2004, 2005, 2007; Mairal & Perinián 2009, 2010; Perinián & Mairal 2009), specifically, its ontology or the module where semantic knowledge is stored. We believe that, if the current RRG semantic representations - stored in the lexicon - are linked to the conceptual information stored in the FunGramKB ontology, the *ad hoc* stipulations previously mentioned could be dispensed with.

The article is structured as follows. In section 2, concepts such as ‘collocation’ and ‘selection restriction’ are discussed within the context of FunGramKB. In section 3, the cognitive domain of POSSESSION is employed to exemplify the most relevant selection constraints captured in the basic concepts (subsection 3.1), terminal concepts (subsection 3.2), and subconcepts (subsection 3.3) of this dimension. In subsection 3.4, we also detail how the selection preferences coded in these three types of concepts are arrived at and where collocations are incorporated in FunGramKB. Finally, some conclusions are provided in section 4.

2. The concepts of collocation and selection restriction within FunGramKB

As Mairal and Perinián (2009: 220) point out, FunGramKB is made up of two information levels:

- i) Lexical level = linguistic knowledge
- ii) Conceptual level = non-linguistic knowledge

Each of these information levels in turn consists of several independent but interrelated modules. The lexical level comprises a) the various lexica (e.g. English, Spanish, Italian, German, etc.), preserving the major linguistic assumptions of RRG – logical structures, macroroles, etc –, and b) the morphicon, which handles cases of inflectional morphology.³ The conceptual level consists of three modules: a) the ontology or the hierarchical structure of concepts; b) the cognicon, where procedural information is kept; and c) the onomasticon, where information about instances of entities and events is stored. This division of labor between linguistic knowledge in the lexical level and non-linguistic knowledge in the conceptual level conditions the way selection restrictions and

² FunGramKB was born as a user-friendly online lexico-conceptual natural language processing system that sought to develop a conceptual approach based on deep semantics. Drawing from previous work by Perinián and Arcas (2004, 2005, 2007), this knowledge-base system has fused with the comprehensive theory of meaning, grounded on the RRG framework, known as the Lexical Constructional Model (hereafter LCM; Mairal & Ruiz de Mendoza 2008, 2009; Ruiz de Mendoza & Mairal 2008, among others) in an attempt to build an updated and robust FunGramKB that benefits from the best of both worlds, that is, a lexico-conceptual knowledge base with rich semantic and syntactic information. For further information on FunGramKB and the LCM, we refer the reader to the Lexicom group research webpage: www.lexicom.es.

³ A third linguistic module is currently being developed within the Lexicom group: the gramaticon. Its function is to capture the properties that are specific to the most relevant constructional families in the languages under consideration in the ontology which, so far, are English, Spanish, Italian, French, German, and Bulgarian.

collocations are treated in FunGramKB. Since the lexical level accounts for morphosyntactic and pragmatic lexical knowledge, collocations, but not selection restrictions, belong in here. Let us explain this in detail.

Since its first occurrence in Firth (1957), the term ‘collocation’ has been discussed extensively in the bibliography and under various names too: ‘co-occurrences’ (Harris 1957), ‘lexical solidarities’ (Coseriu 1967), ‘lexical selection’ (Bosque 1982), and so on.⁴ In FunGramKB, however, collocations are understood in a broad sense to refer to those combinations of lexemes that commonly and frequently co-occur in a language, including both grammatical and lexical collocations. Thus, the fact that in English something depends ‘on’ something else, but in Spanish it depends ‘de’ – *of* – or that one ‘takes’ a size five in shoes in English but in Spanish the verb used is *calzar*, find their way into the various lexica of FunGramKB, depending on the language the collocations are associated with.

As for selection restrictions, unlike the restrictive treatment given by Generative Grammar, they are understood not only as semantic requirements on the nature of the arguments a predicate subcategorizes for, but as conceptual constraints prototypically related to cognitive situations. They are not word-oriented, so their place in FunGramKB is the conceptual level, specifically, the ontology. For instance, let us take the concept EAT. Among the 300 events or so stored in the ontology, which presents the hierarchical catalogue of all the concepts a person has in mind when talking about everyday situations, the first participant of the concept EAT is codified as being prototypically human or animal, whether you are using English, Spanish or Japanese to express it. The reason for this is that our commonsense knowledge tells us that, if we want to be consistent with our world model, in order to eat you need a mouth, which is something that only animals and people have. Therefore, traditional selection restrictions are better known as ‘selectional preferences’ in FunGramKB. In the next section, we will detail where selectional preferences appear and how they are described in the ontology within POSSESSION.

It should be emphasized that the approach FunGramKB takes on selectional preferences as belonging in the conceptual level of information is totally consistent with the view, sustained by most linguists – Coseriu (1967), McCawley (1968), Fillmore (1970), Bosque (2004), to name just a few -, that selection restrictions provide non-linguistic information, since the information expressed through features like ‘human’, ‘animal’, etc., has no relation whatsoever with our knowledge of languages like English, Spanish or Japanese, but with ‘the real world’ and our experiences there.

3. FunGramKB selectional preferences: the domain of POSSESSION

Selectional preferences appear in the ontology in two conceptual schemata known as thematic frames (henceforth TFs) and meaning postulates (hereafter MPs). They will be exemplified in the dimension of POSSESSION which, according to Jackendoff (1992: 79), *apud* Faber & Mairal (1996: 264) is:

⁴ The interested reader can find a thorough review of the main authors that have studied this topic in Koike (2001). Among others, one can mention the studies on English, German and French collocations by Halliday (1961, 1966), Sinclair (1966), Coseriu (1967), Mitchell (1971), Mel’cuk (1981) or Cruse (1986), as well as the accounts of Spanish collocations by Mendiivil (1991), Alonso Ramos (1993), Corpas (1996), and Wotjak (1998).

an artificial relationship established between two entities, one of whom has the right or authority to use the other as he wishes and has the right or authority to control anyone else's use of the other, and to impose sanctions for uses other than those he permits.

In the figure below, we can see the domain of POSSESSION in the ontology as hierarchically connected to RELATIONAL > STATIVE > EVENTS:



Figure 1. POSSESSION in the FunGramKB ontology.

As explained in Perinán and Mairal (2009: 267), TFs and MPs provide the semantic properties used to characterize the basic and terminal concepts that populate the ontology. The former, which appear headed by symbol +, are explained in 3.1, whereas the latter, preceded by symbol \$, are presented in 3.2.

3.1. Selectional preferences in basic concepts

One must bear in mind that both TFs and MPs employ concepts to formally describe meaning. Consequently, they are language-independent conceptual schemata, not lexical representations. Example (1) shows the TF and MP of the basic concept +WEAR_00, to which lexical units like English *wear*, *have on*, *dress* or Spanish *llevar*, *llevar puesto*, *traer*, etc. are linked:

(1) +WEAR_00:

TF: (x1: +HUMAN_00 ^ +PET_00)Theme (x2: +GARMENT_00 ^ +ORNAMENT_00)Referent

MP: +(e1: +HAVE_00 (x1)Theme (x2)Referent (f1: +BODY_AREA_00)Location (f2: +ON_00)Position)

The TF and MP above specify the number and type of participants involved in the prototypical cognitive situation of 'wearing', as well as the generic features associated with the conceptual meaning of this concept. Since every participant in the TF must be referenced through co-indexation to a participant in the MP of that concept, (1) has the following interpretation: a typically human entity or pet₁ (Theme) has a garment or ornament₂ (Referent) located on his/her body (Location). The selectional preferences of

the concept WEAR are then: +HUMAN_00, +PET_00, +GARMENT_00, +ORNAMENT_00, +BODY_AREA_00 and +ON_00. They are situated in the TFs and MPs of the ontology because it is there that they can exert constraints typically related to the cognitive situation displayed by the events. If we come to think about the event of wearing something, we all know that, out there in ‘the real world’, human beings and pets are the ones that can prototypically have ribbons, clothes, shoes, jewelry, etc. Therefore, through the selectional preferences +HUMAN_00, +PET_00, +GARMENT_00, +ORNAMENT_00, we are going beyond linguistic knowledge to try and capture our world model. Figure 2 shows how this information is displayed in the ontology:



Figure 2. Ontological information of +WEAR_00.

Examples (2), (3) and (4) illustrate the selectional preferences for the basic concepts HAVE, HOLD and STORE:

(2) +HAVE_00

TF: (x1: +HUMAN_00 ^ +ANIMAL_00)Theme
(x2: +CORPUSCULAR_00 ^ +HUMAN_00 ^ +ANIMAL_00 ^ +SUBSTANCE_00 ^ +ORGANIZATION_00)Referent

(3) +HOLD_00

TF: (x1: +HUMAN_00)Theme (x2: +CORPUSCULAR_00)Referent

MP: +(e1: +HAVE_00 (x1)Theme (x2)Referent (f1: +HAND_00 | +ARM_00)Location)

(4) +STORE_00

TF: (x1: +HUMAN_00 ^ +ANIMAL_00 ^ +ORGANIZATION_00)Theme (x2: +ARTEFACT_00 ^ +CORPUSCULAR_00 ^ +SUBSTANCE_00)Referent

MP: +(e1: +HAVE_00 (x1)Theme (x2)Referent (f1)Location (f2: +LONG_01)Duration)

As for the concept +HAVE_00, its representation of (2) only includes the TF. There is no MP because it is an undefinable or semantic primitive and no other concepts can be used to provide its conceptual meaning. Thus, its TF describes a prototypical cognitive scenario in which entity 1 (Theme), being typically human or animal, has or possesses another entity 2 (Referent), which is typically a three dimensional countable object, or a human, or an animal, or a type of substance, or a company.

The concepts +HOLD_00 and +STORE_00, on the other hand, do have a TF and a MP. The basic concept +HOLD_00 has the following conceptual definition: a typically human entity₁ (Theme) has another entity₂ (Referent) in his arms and/or hands (Location), being this second entity prototypically a three dimensional or corpuscular object. The representation of +STORE_00 details that a human or an animal or an organization (Theme) can typically have man-made objects or corpuscular objects or substances (Referent) kept somewhere (Location) and for a long time (Duration).

3.2. Selectional preferences in terminal concepts

Selectional preferences are also valuable when creating terminal concepts in the FunGramKB ontology. Since a terminal concept can only be encoded when there is a conceptual restriction on the meaning of a basic concept (Mairal & Periñán 2009: 223-224), selectional preferences allow us to codify the distinguishing parameters that differentiate them. Let us have a look at the representation of the terminal concepts \$ABOUND_00, \$GRASP_00 and \$SPORT_00, which are a further specification of the basic concepts +HAVE_00, +HOLD_00 and +WEAR_00, respectively:

(5) \$ABOUND_00

TF: (x1: +HUMAN_00^+ANIMAL_00)Theme (x2: +CORPUSCULAR_00^+ANIMAL_00^+SUBSTANCE_00^+ORGANIZATION_00)Referent

MP: +(e1: +HAVE_00 (x1)Theme (x2)Referent (f1: +MUCH_00)Quantity)

(6) \$GRASP_00

TF: (x1: +HUMAN_00)Theme (x2: +CORPUSCULAR_00)Referent

MP: +(e1: +HOLD_00 (x1)Theme (x2)Referent (f1: +TIGHT_00)Manner)

(7) \$SPORT_00

TF: (x1: +HUMAN_00)Theme (x2: +GARMENT_00 ^ +ORNAMENT_00)Referent

MP: +(e1: +WEAR_00 (x1)Theme (x2)Referent (f1: (e2: +SHOW_00 (x1)Theme (x2)Referent (f2: +PROUD_00)Manner)) Purpose)

If compared with the representation of +HAVE_00 in (2), the terminal concept \$ABOUND_00 specifies that what is had (Referent) happens to occur in large numbers.

This is accurately codified in the MP of \$ABOUND_00 by means of the inclusion of the selectional preference +MUCH_00, which exerts a conceptual constraint on the f1 or the QUANTITY adverbial/satellite. Notice that this concept is lexicalized in English and Spanish with verbs such as *abound*, *be rich in*, *abundar* and *rebosar*.

\$GRASP_00, to which lexical units like English *carry*, *bear*, *grasp*, *clasp*, *clutch*, *grip*, *hold on* or *wield*, and Spanish *aferrar*, *agarrar*, *asir* or *empuñar* are linked, narrows down the content of +HOLD_00 – see representation (3) – in the sense that this event is now performed firmly, tightly. By employing the basic concept +TIGHT_00 as a selectional preference of the Manner satellite f1, we can easily record this.

Finally, when one wears something very proudly so that everybody can see it, which in English is expressed by the verb *sport* and in Spanish by *lucir* and *ostentar*, the terminal concept \$SPORT_00 arises. This further elaboration of the basic concept +WEAR_00 can also be accounted for by including the selectional preference +PROUD_00 in the Manner satellite of its MP. Below is the representation of these three terminal concepts in the ontology, preceded by a yellow bullet and the \$ symbol:

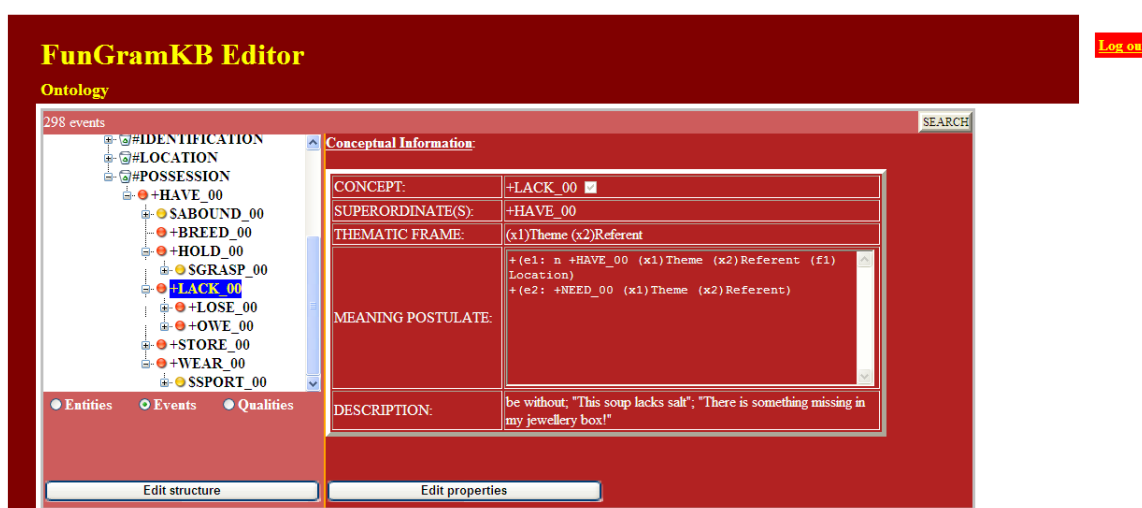


Figure 3. The terminal concepts ABOUND, GRASP, and SPORT in the ontology

3.3. Subconcepts

It is also worth mentioning that there are cases in which the conceptual restriction or specification takes place exclusively in one or all of the participants of the TF of a basic or terminal concept, without varying the MPs. These are known as subconcepts in FunGramKB and appear preceded by a minus symbol and in capital letters. Within the domain of POSSESSION, we have been able to identify the following ones:

(8)

- a. -WIELD: a conceptual specification of the terminal concept \$GRASP_00 (cf. (6)) and lexicalized as *wield*, *carry*, *bear* and *empuñar*.
- b. -MISPLACE: linked to the basic concept +LOSE_00 and lexicalized in Spanish as *traspapelar* (lit. ‘misplace a paper’).
- c. -SAVE: associated to the basic concept +STORE_00 (cf. (4)), which English and Spanish express as *save* and *ahorrar*.

d. -TAKE: a specification of the basic concept +WEAR_00 (check (1)) and expressed in Spanish with the verb *calzar* ('wear shoes or boots').

All the above subconcepts are not really visible in the ontology, unlike basic concepts and terminal concepts – cf. Figures 2 and 3 -. In other words, they do not 'hang' in the hierarchical organization of concepts because they are conceptual specifications of one of the participants of an already existing concept. For instance, -WIELD arises because the selectional preferences for the second participant in the TF of \$GRASP_00 are weapons only, unlike the corpuscular object specified for \$GRASP_00 in (6). Notice, however, that both must share the same MP.

As illustrated in (9), in the case of -MISPLACE the first participant is exclusively restricted to humans and the second one to paper. This clearly narrows down the selectional preferences of the Theme and Referent entities in the TF of +LOSE_00, which could also include animals for the first participant and only a corpuscular object for the second one – cf. representation (10) below -. Both share the same conceptual meaning or MP, namely, an entity does not have another entity because s/he put it somewhere s/he can't remember.

(9) -MISPLACE

TF: (x1: +HUMAN_00)Theme (x2: +PAPER_00)Referent

(10) +LOSE_00

TF: (x1: +HUMAN_00^+ANIMAL_00)Theme (x2: +CORPUSCULAR_00)Referent

MP: +(e1: +LACK_00 (x1)Theme (x2)Referent (f1: (e2: past +PUT_00 (x1)Agent (x2)Theme (x3)Origin (x4)Goal))Reason (f2: (e3: n +REMEMBER_00 (x1)Agent (x1)Theme (x4)Referent))Reason)

As far as -SAVE is concerned, it is also the selectional preferences of the two participants of +STORE_00 that are specified. If compared to its TF in (4), the first participant of -SAVE does not include animals, whereas the second one is only MONEY:

(11) -SAVE

TF: (x1: +HUMAN_00 ^ +ORGANIZATION_00)Theme (x2: +MONEY_00)Referent

Finally, when the selectional preferences of the Theme and Referent entities of the basic concept +WEAR_00 are restricted to people and shoes, boots, etc., respectively, we come up with the subconcept -TAKE:

(12) -TAKE

TF: (x1: +HUMAN_00)Theme (x2: +SHOE_00)Referent

3.4. The elaboration of selectional preferences

But the immediate question now is: how have we been able to work through the selectional preferences commented above? For this purpose, we have greatly benefited from

monolingual, bilingual, multilingual dictionaries, lexicons, thesauri and corpora available in the market. Among others, we can mention:⁵

(13) English data:

- MULTIWORDNET
- WORDREFERENCE
- COLLINS THESAURUS
- WOXICON
- BBI
- LTP
- OCD
- The Corpus Concordance and Collocation Sampler from *The Collins Wordbanks Online English corpus*.

(14) Spanish data:

- MARÍA MOLINER
- CASARES
- CLAVE
- DRAE
- REDES
- ADESSE
- CREA

One word is needed here for the exhaustive and precise work on selection restrictions carried out by Ignacio Bosque (2004) in *REDES*. It has been really useful for our purposes since it is one of the first Spanish dictionaries exclusively devoted to these issues, which, unlike the English collocation dictionaries, takes as starting point the semantic relation between a predicate and its argument(s) and the notion of lexical class. However, as there are not yet dictionaries that provide us with conceptual definitions, preferences, TFs, etc, we have had to basically follow this step-by-step process:

- (i) look up every single word belonging in POSSESSION in the English and Spanish resources mentioned in (13) and (14) above;
- (ii) note down all the lexical information given for their selection restrictions, collocations, words that typically occur as subjects or objects, etc.;

⁵ Full references for the resources of (13) and (14) are provided in the References section of this paper, subsection 5.1.

(iii) look for abstract labels or ‘umbrella’ patterns that could work for every word linked to a particular concept and in every language we are working with. One cannot forget that, although taking lexical information as point of departure, our purpose is to list selectional preferences, that is, conceptual constraints. Therefore, we must really abstract away from specific words and come up with the participants our commonsense knowledge would identify as being prototypically part of cognitive scenarios such as ‘having something’, ‘losing something’, ‘wearing something’ and so on;

(iv) find the appropriate concepts to codify them among the almost 2,000 basic concepts available in the FunGramKB ontology: +HUMAN_00, +GARMENT_00, etc.⁶

After this account of selectional preferences, there is yet a last issue that needs to be addressed, i.e., the place of collocations in FunGramKB. As pointed out in section 2, collocations are word-oriented so they are stored in their appropriate lexica, depending on the language the word is associated with. For instance, let us take the Spanish word *atesorar* (English *hoard*, *accumulate*), which is one of the words that lexicalizes the concept +STORE_00 in (4), as illustrated below:

The screenshot shows the FunGramKB Editor interface. On the left, the 'Ontology' tree is displayed, showing a hierarchy of concepts. The concept +STORE_00 is highlighted in blue. Below the tree, there are buttons for 'Entities', 'Events', and 'Qualities', and a button for 'Edit structure'. On the right, the 'Conceptual Information' panel is shown, containing a table with the following information:

CONCEPT:	+STORE_00 <input checked="" type="checkbox"/>
SUPERORDINATE(S):	+HAVE_00
THEMATIC FRAME:	(x1: +HUMAN_00 ^ +ANIMAL_00 ^ +ORGANIZATION_00)Theme (x2: +ARTEFACT_00 ^ +CORPUSCULAR_00 ^ +SUBSTANCE_00)Referent
MEANING POSTULATE:	+(e1: +HAVE_00 (x1)Theme (x2)Referent (f1) Location (f2: +LONG_01)Duration)
DESCRIPTION:	provide storage for or keep in storage

Below the conceptual information panel, there are buttons for 'Edit properties' and 'Edit structure'. At the bottom, there are three panels for different languages: English, Spanish, and Italian. Each panel has a list of lexical units and a table with columns Y, N, and X. The English panel shows the words 'accumulate', 'bond', 'garner', 'hoard', and 'keep'. The Spanish panel shows the words 'acaparar', 'acumular', 'ahorrar', 'almacenar', and 'atesorar'. The Italian panel is empty.

Figure 4. English and Spanish lexical units linked to the concept +STORE_00.

⁶ As commented in Mairal & Perinán (2009: 224), the inventory of almost 2,000 basic concepts employed in FunGramKB stems from the defining vocabulary used in the *Longman Dictionary of Contemporary English* (Procter 1978) and in the *Diccionario para la Enseñanza de la Lengua Española* (Alvar Ezquerro 1995).

According to REDES, *atesorar* frequently occurs with the following words: ‘victoria’/victory, ‘éxito’/success, ‘información’/information, ‘secreto’/secret, and ‘recuerdo’/memories. Therefore, FunGramKB inserts all these collocates in the Spanish lexicon as part of the morphosyntactic and pragmatic information linked to this word. To be more specific, these collocates appear in the LCM core grammar block of the Spanish lexicon, in the ‘collocations’ slot for the second argument (y) of *atesorar*, as can be seen below:

The screenshot displays the FunGramKB interface for the Spanish verb 'atesorar'. The interface is divided into two main sections: 'AktionsArt:' and 'Lexical Template:'.
 In the 'AktionsArt:' section, a dropdown menu is set to 'Achievement'. Below it, a note states: 'You determine the canonical lexical class(es) of the verb.'
 The 'Lexical Template:' section contains several fields:
 - 'Variables: <-- no functions -->' (dropdown)
 - 'Idiosyncratic features: [MR <-- no value selected -->], [U = <-- no value selected -->]' (dropdowns)
 - 'Thematic frame mapping: X = [no function], Y = [no function], Z = [no function]' (dropdowns)
 - A reminder box: 'A REMINDER OF FUNGRAMKB PARTICIPANTS: THEME: Entity that owns another entity. REFERENT: Entity that is owned.'
 - 'Prepositions: X = a, Y = a, Z = a' (dropdowns with 'Y' and 'N' buttons)
 - 'Collocations: X = , Y = , Z =' (input fields with 'Y' and 'N' buttons). The 'Y' field is populated with a list: 'éxito', 'información', 'recuerdo', 'secreto', 'victoria'.

Figure 5. Collocations of ‘atesorar’/hoard in the FunGramKB Spanish lexicon.

On the other hand, its English equivalent *hoard*, according to the *Collins Corpus Concordance and Collocation Sampler* consulted, typically collocates with words such as *flaw*, *time*, *misery*, *nostalgia* and *information*. Accordingly, as displayed below, these collocations appear in the English lexicon, specifically in the ‘collocations’ slot for the second argument (y) of *hoard*:

The screenshot displays the FunGramKB English lexicon interface. On the left is a dark green vertical bar. The main area is light green and divided into sections. The top section, labeled 'Lexical Template:', contains a 'Prepositions:' subsection with three dropdown menus, each set to 'aboard' and followed by 'Y' and 'N' buttons. Below these are three empty rectangular boxes. The middle section, labeled 'Collocations:', has three input fields for 'X', 'Y', and 'Z', each with 'Y' and 'N' buttons. The 'Y' field is populated with a list: 'information', 'time', 'flaw', 'misery', 'nostalgia'. Below this are four subsections: 'AFFECTING TRANSITIVITY: alternations involving a change in the verb's transitivity' with a list of four options (Causative/inchoative, Conative, Induced action, Middle construction); 'PHRASE SHIFT: alternations involving the shift of some phrase found with the verb but without a change in transitivity' with a list of three options (Apart-reciprocal intransitive, Apart-reciprocal transitive, As); 'PHRASE ADDITION/REMOVAL: alternations involving a change in the number of phrases found with the verb but without a change in transitivity, resulting in oblique subject alternations'; and 'MISCELLANEOUS: other constructions'. The bottom left corner is labeled 'Constructions:'.

Figure 6. Collocations of *hoard* in the FunGramKB English lexicon.

The lexico-conceptual nature of FunGramKB accounted for in these pages, that is, the lexical and conceptual levels of information, allows a direct linkage between the grammatically salient lexical information of the RRG logical structures included in the different lexica – *Aktionsart* class, macrorol, etc., in Figures 5 and 6 – and the conceptual meaning of the TFs and MPs of the ontology. As detailed in Perrián & Mairal (2009: 269-270), such a gap is bridged through an abstract representational mechanism known as *conceptual logical structure* (CLS). In fact, there is available a CLS Constructor that can automatically build CLSs from the RRG representations stored in the LCM Core Grammar block. To illustrate, among other things, the Constructor would match each variable in the lexical template of the word under consideration – e.g. *hoard* – onto one and only participant in the TF of the concept that lexical item is linked to, i.e. +STORE_00 in Figure 4. We will leave for further research the inner workings of the CLS Constructor.

4. Conclusion

This paper has put forth how selection restrictions and collocations can be accounted for by the FunGramKB's conceptualist view on language. Among others, here are some of the advantages of such approach for RRG:

- (i) by posing two information levels, that is, the ontology and the different lexica, RRG semantic representations can be deeply enriched, including all types of information that go well beyond those aspects of meaning with an impact on syntax – e.g. selection restrictions – by linking these RRG structures to the conceptual meaning structures of the ontology;
- (ii) this theoretical move is done at a very low cost, because the ontology is based on a hierarchical inference system, which means that information can be placed in and

retrieved from all the different ontological properties: TFs, MPs, subconcepts, etc. Thus, “redundancy is minimized while informativeness is maximized” (Periñán & Mairal 2009: 269);

- (iii) since ontological concepts are universal, in principle every single language could be implemented in FunGramKB.

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Romance Anticausatives

A Constructionist RRG Approach

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Abstract

In the present paper, I will account for anticausative constructions as being located in the centre in an active-passive continuum ranging from real reflexive constructions to reflexive passives. My claim will be that the continuum can be modelled using the activity-calculus elaborated in Kailuweit (2005) for different classes of verbs of emotion. It will be shown that RRG Constructional Schemas can be used to account for the language-specific particularities of anticausative constructions in different Romance languages.

Keywords

Anticausative variation, Romance languages, activity-calculus, constructional schemas

0. Introduction

Brazilian Portuguese (BP)¹ shows an interesting contrast concerning the presence or absence of the pronominal element in anticausative constructions:

- (1) sem: hurt(arg₁, arg₂) (e.g., John hurt Louis with a knife)
pb: João machucou Luis.
John hurt Louis
- (2) sem: hurt(arg₁, arg₂) (e.g., Louis fell from the roof of his house)
pb: Luis machucou.
Louis hurt
- (3) sem: hurt(arg₁, arg₂) (e.g., Louis hurt himself preparing sushi)
pb: Luis se machucou.
Louis himself hurt
- (4) sem: save(arg₁, arg₂) (e.g., Louis has saved the file)
pb: Luis salvou o arquivo.
Louis saved the file

¹ Data presented by Ulrich Reich at the workshop *Linking Romance*, FU Berlin, february 2009.

- (5) sem: save(arg₁, arg₂) (e.g., somebody and I don't care who has saved the file)
 pb: O arquivo salvou rápido.
 The file saved quickly

As we will see later in detail, all Romance languages allow for transitive / bare intransitive pairings as illustrated by BP *salvar* although they occur with other verbs. Hence, they seem to permit a causative alternation as it has been described for English,² without a pronominal element stemming from Latin SIBI ('self'). But in addition, there is evidence in French, Italian, Spanish and also in German – to mention a non-Romance language – for verbs of the *machucar*-type in BP, i.e. verbs allowing for a pronominal and a bare intransitive construction. But as far as I can see, neither in other Romance languages nor in German does an alternating verb denote the eventuality of 'hurt'.

As far as linking from semantics to syntax is concerned, the appearance of the pronominal construction in BP seems to be triggered by a semantic feature of the argument, that I will informally call 'responsibility'. While neither *Luis* in (2) nor *o arquivo* in (5) are responsible for the occurrence of the change of state, *Luis* in (3) performs unintentionally an action to himself that leads to an injury. Onomasiologically, the linking-problem seems to be the reason why this evident semantic difference is not coded in other Romance languages. But on the one hand, examples parallel to those with *machucar* are not that easy to detect in BP and on the other, formally identical pairings that we could find in French and Italian do not seem to reflect the same straightforward semantic contrast stipulated for BP *machucar*.

The objective of my paper will consist of dealing with the whole range of pronominal versus bare intransitive variation. I will account for the continuum ranging from the real reflexive construction passing through different types of marked and unmarked anticausatives to reflexive passives. My claim will be that the continuum can be modelled using the activity-calculus elaborated in Kailuweit (2005) for different classes of verbs of emotion. Finally, it will be shown that RRG Constructional Schemas can be used to account for the language-specific particularities of anticausative constructions in different Romance languages. Hence, the paper will also contribute to the current discussion as regards to what extent RRG could be considered a Construction Grammar.

² Cf. Levin / Rappaport Hovav 1995: Chap. 3.

1. The (anti-)causative alternation

The given PB data appear to be instances of what has been called the causative alternation (Smith 1970; Levin / Rappaport Hovav 1995). As Sánchez López (2002: 80) points out, the transitive variant should be interpreted as a two place predicate with a cause argument filling the subject position and an undergoer argument realized as a direct object. The undergoer appears as the subject of the intransitive or pronominal construction, the cause argument can be realized as an adjunct. The data from BP might be slightly modified to ensure that the transitive and the intransitive or pronominal variant denote a corresponding type of eventuality:

- (6) a. A queda machucou Luis
The fall hurt Luis
b. Luis machucou por causa da queda
Luis hurt because of the fall
- (7) a. João machucou Luis sem querer
John hurt Luis by accident
b. Luis se machucou por causa de uma inadvertência preparando sushi
Luis himself hurt inattentively preparing sushi
- (8) a. A tecla Control+S salvou o arquivo
The button Control+S saved the file
b. O arquivo salvou com a tecla Control+S
The file saved with the button Control-S

While the transitive variant is generally labelled the causative construction, there is a lot of terminological inconsistency as far as the intransitive variants are concerned. Following Schäfer (2008),³ I will call both the pronominal and the bare intransitive construction anticausative. As Labelle (1992: 397) and Sánchez López (2002: 86) point out, the widespread term inchoative for the intransitive variant(s) is misleading, because only a few of the intransitives refer to the beginning of an action or to an action soon to take place. According to Sánchez López (ibd.), *arrepentirse* ('to regret') is inchoative, *hundirse* ('to sink') denotes the beginning and the completion of a process and *secarse* ('to dry') is clearly not inchoative:

- (9) a. Juan se arrepintió ('John started to feel sorry')
b. El barco se hundió ('The ships started to sink' / 'The ship sank')

³ The term *anticaustive* is already used in Spanish by Moreno Cabrera (1984).

c. La ropa se secó ('The clothes dried')

PB *machucarse* is obviously not inchoative neither. *Luis se machucou* does not mean that he started to hurt himself, but that the action is already completed.

Going back to Haspelmath (1993), who documented the whole range of morphological procedures to mark either the causative or the anticausative construction, an extensive, but fruitless discussion about which of the two should be considered the basis construction disseminated in the literature. Van Valin (2005: 46) emphasized that there is evidence for both derivation directions. It has been claimed that the derivation of the anticausative construction by means of a pronominal element is the default case for Romance languages. Nonetheless, the bare intransitive construction can also be documented for in all Romance languages.⁴ For BP a tendency towards the loss of the pseudo-reflexive has been proven (cf. Nunes 1995; Carvalho 2006). The direction of the derivation will not be an issue of the present paper.

In order to determine the verbs that enter the causative alternation, Levin / Rappaport Hovav (1995: 90s) distinguish between internally and externally caused eventualities. The distinction is based on Smith (1970: 107) who describes eventualities denoted by verbs like *open* or *break* as controlled by an external cause, while for eventualities such as those denoted by verbs like *laugh* or *play* control cannot be relinquished. Levin / Rappaport Hovav (1995: 91) reject the term 'control', because the distinction could be extended to non agentive verbs, e.g. verbs of emission.

The semantics of internal and external causation are captured as follows:

With an intransitive verb describing an internally caused eventuality, some property inherent to the argument of the verb is "responsible" for bringing about the eventuality [...] Unlike internally caused verbs, externally caused verbs by their very nature imply the existence of an "external cause" with immediate control over bringing about the eventuality described by the verb: an agent, an instrument, a natural force, or a circumstance. (Levin / Rappaport Hovav 1995: 91s).

According to Levin / Rappaport Hovav (1995), the distinction between internal and external causation should lead to two clear-cut classes: externally caused intransitives should behave as unaccusatives, but internally caused intransitives as inergatives. While the former allow for

⁴ Rothemberg (1974) for French, Centineo (1995) for Italian, Carvalho (2006) for European Portuguese. Sánchez López (2002: 89) cites a study of Levy (1994) who attests 25 cases of bare intransitives out of 300 Spanish causative-anticausative pairs.

a transitive causative variant and reject embedding with MAKE,⁵ the latter should only extend their argument structure by means of the MAKE construction.⁶

As Labelle (1992) claims for French and Sánchez López (2002) for Spanish, in Romance languages the difference between internal and external causation should be reflected by the absence or presence of the pseudo-reflexive clitic. Labelle's argumentation is based on Rothemberg (1974) who develops an idea quite similar to that coded in the terms of external and internal causation:⁷

... pour les verbes intransitifs [...] l'élément lexical assumant la fonction de sujet est le siège de l'action, du processus qui est vu comme se développant organiquement à partir de lui et rien qu'à partir de lui grâce à ses qualités inhérentes [...] Quant aux verbes en construction pronominale [...] l'élément lexicale assumant la fonction du sujet est également le siège de l'action, du processus qui est vu comme se développant à partir de lui. Le *se* de la récession marque pourtant que ses qualités inhérentes [...] sont insuffisantes à elles seules pour permettre la réalisation de l'action ou du processus. (Rothemberg 1974: 67).

[...for intransitive verbs [...] the lexical element assuming the function of the subject is the host of the action, i.e. of the process that is seen as developing organically out of it and only out of it because of its internal qualities [...] As far as the pronominal construction is concerned [...] the lexical element assuming the function of the subject is the host of the action, too, i.e. of the process that is seen as developing out of it. However, the *se* of the recession marks that its internal qualities [...] are insufficient on their own to bring about the realization of the action or the process]

However, the data are more complex. There is no clear-cut line between the two groups of verbs. The syntactic behaviour of bare intransitives in Romance and German languages is not consistent. We have already seen that in several Romance languages bare intransitive verbs also enter the causative alternation. There are a considerable number of verbs such as Italian *aumentare* or German *kochen*, that only allow for the bare intransitive construction and show a transitive variant.⁸ While Labelle (1992) assumes that alternating French bare intransitives are inergatives, the choice of BE for compound tenses that we observe for most alternating bare intransitives in Italian and German hints at their unaccusativity. For modern Spanish that does not show auxiliary variation any more, Mendikoechea (1999) and Sánchez Lopez also tend to classify alternating bare intransitives as unaccusatives. Nonetheless, unaccusativity is neither a sufficient nor a necessary condition for entering the causative alternation. While

⁵ Sánchez López (2002: 90) illustrates this behaviour with the following examples: i. *El viento cerró la ventana* ('The wind closed the window') / ii. **El viento hizo cerrar la ventana* ('The wind made the window close').

⁶ Levin / Rappaport Hovav (1995: 90) cite the following examples taken from Smith (1970: 107): i. *The green monster made Mary shudder* / ii. **The green monster shuddered Mary*.

⁷ Levin / Rappaport Hovav (1995: 85; 294) only cite Rothemberg (1974) in an endnote as a general source of inspiration.

⁸ In fact, the study of Rothemberg (1974) seems to be the first systematic approach to alternating verbs in French. She leaves no doubt that the alternation is possible with and without pronominal marking.

Italian unaccusative *aumentare* ('increase') allows for a causative variant, the corresponding German unaccusative verb *steigen* does not. On the contrary, German unergative *kochen* ('cook') permits a causative construction.

- (10) a. I prezzi (**si*) sono aumentati ('The prizes increased')
- b. Gianni ha aumentato i prezzi ('John increased the prices') (Folli 2002: 117s)
- c. Die Preise sind gestiegen ('The prices increased')
- d. *Hans hat die Preise gestiegen ('John increased the prices')
- (11) a. Die Kartoffen haben (**sich*) gekocht ('The potatoes cooked')
- b. Hans hat die Kartoffeln gekocht ('John cooked the potatoes')

In addition, the fact that the same verb in different languages appears in different anticausative constructions, casts doubt on a clear correspondence between pronominal marking and external causation:

- (12) a. Se hundió el barco ('The ship sank') (Menikoechea 1999: 1587)
- b. La barca è affondata ('The ship sank') (Folli 2002: 73)

In the following, the relationship between marking and external causation should be acknowledged as a tendency. This could be formalized by Hypothesis I:

- (13) HYPOTHESIS I: If the difference between internal and external causation is coded, external causation will be coded with the pronominal construction and not with the bare intransitive construction.

3. Verb classification

While the ongoing change in BP makes it difficult to classify the alternating verbs into different subgroups according to the morphological marking of their anticausative variant, such verb-lists have been compiled for French, Italian and Spanish. Based on the detailed study of Rothemberg (1974), Labelle distinguishes three subgroups for French:⁹

Verbs entering only the pseudo-reflexive construction:

- (14) s'alléger ('become lighter'), s'abêtir (turn into a morin'), s'agrandir ('become bigger'), s'allourdir ('become heavier'), s'amaigrir ('become thinner'), s'améliorer ('improve'), s'américaniser ('become americanised'), s'assécher ('dry out'), s'engourdir ('become numb'), s'enkyster ('encyst'), s'humidifier ('become humid'), se calcifier ('calcify'), se civiliser ('become civilised'), se couvrir ('become covered'), se nuancer ('nuance'), se poisser ('become sticky'), se rabougrir ('shriveled up').

⁹ Cavalho (2006) affirms the existence of the same three classes for European Portuguese.

Verbs entering only or mainly the bare intransitive construction:

- (15) cuire ('cook'), durcir ('harden'), éclater ('burst'), fondre ('melt'), grandir ('grow'), grosser ('grow bigger'), maigrir ('grow thinner'), moisir ('mould'), pourrir ('rot'), sécher ('dry'), vieillir ('age')

Finally, verbs entering both constructions:

- (16) caraméliser ('carmelize'), élargir ('widen'), enfler ('swell'), épaissir ('thicken'), gonfler ('inflate'), noircir ('blacken'), ramollir ('soften'), refroidir ('cool'), rétrécir ('get narrower'), rougir ('become red')

For Italian, Folli (2002) establishes the same classes as Labelle (1992) for French, but the verbs entering each class do not always denote the same eventualities.

- (17) alterare ('alter'), aprire ('open'), arrotolare ('roll up'), bagnare ('wet'), capovolgere ('turn up side down'), chiudere ('close'), dividere ('divide'), estendere ('extend'), restringere ('shrink'), rompere ('break'), rovesciare ('overturn'), sbriciolare ('crumble'), sfilacciare ('fray'), svegliare ('wake up')
- (18) affondare ('sink'), allungare ('lengthen'), aumentare ('increase'), bollire ('boil'), cambiare ('change'), diminuire ('decrease'), guarire ('heal'), invecchiare ('age'), maturare ('mature'), migliorare ('improve')
- (19) asciugare ('dry'), bruciare ('burn'), congelare ('freeze'), cuocere ('cook'), fondere ('melt'), gelare ('freeze'), ingrandire ('enlarge'), raffreddare ('cool'), riscaldare ('heat'), sgonfiare ('deflate')

Schäfer (2008) proves the existence of the same three classes in German. Based on the Corpus of Written Language COSMAS-II at the IDS Mannheim, he attests for class C 17 German verbs that allow for both the marked and the unmarked construction.¹⁰

As far as I can see, the existence of class C in Spanish has not been explicitly highlighted in the literature. Mendikoetxea (1999: 1604s), who cites the classification of Labelle (1992), does not give a corresponding list of Spanish verbs alternating in their anticausative construction. She only hints at *aclarar* and *oscurecer* that alternate with different object classes.

- (20) a. El día ha aclarado ('The day has cleared up')
b. El día ha oscurecido de repente ('Suddenly, the day has clouded over')
- (21) a. El jersey se ha aclarado por sí solo ('The sweater has beached itself')
b. Su fama se ha oscurecido por sí solo ('His fame has dimmed on its own')
(Mendikoechea 1999: 1599)

¹⁰ Schäfer (2008: 24-28) also refers to Greek showing the same distinction of three classes by the presence or absence of non-active morphology. I will not discuss Greek data in this paper.

The small group of verbs of ‘internal causation’¹¹ that Mendikoechea (1999: 1597) compiles could be a starting point for proving the existence of the three classes in Spanish:

- (22) adelgazar (‘slim’), arder (‘burn’), aumentar (‘increase’), crecer (‘grow’), empeorar (‘worsen’), empezar (‘start’), empobrecer (‘impoverish’), encoger (‘shrink’), enfermar (‘sicken’), enfriar (‘cool’), engordar (‘fatten up’), ennegrecer (‘blacken’), enrojecer (‘flush’), ensanchar (‘widen’), ensordecer (‘deafen’), envejecer (‘age’), florecer (‘blossom’), germinar (‘sprout’), hervir (‘boil’), mejorar (‘ameliorate’), palidecer (‘pale’)

Most of them seem to be verbs of class B, but some are clearly verbs of class A. They always take the pronominal element as their intransitive variant:

- (23) enfriarse (‘cool’), enfermarse (‘sicken’)

Sánchez López (2002: 89-93) adds some verbs of internal causation to this list:

- (24) ascender (‘ascend’), menguar (‘wane’), finalizar (‘finish’), rejuvenecer (‘rejuvenate’)

Nonetheless, some of the verbs allow for both the pronominal and the bare intransitive construction. Hence, class C verbs also exist in Spanish:

- (25) adelgazar(se) (‘slim’), empeorar(se) (‘worsen’), empobrecer(se) (‘impoverish’), encoger(se) (‘shrink’), engordar(se) (‘fatten up’), ennegrecer(se) (‘blacken’), enrojecer(se) (‘flush’), ensanchar(se) (‘widen’), envejecer(se) (‘age’), hervir(se) (‘boil’), mejorar(se) (‘improve’), rejuvenecer(se) (‘rejuvenate’)

I will not give examples for all verbs. They can be easily found in the Spanish online Corpora (CREA of the Real Academia Española and Corpus of Español by Mark Davies). Not all verbs are equally accepted as instances of class C. The use of *hervirse* is not approved by the RAE, but confirmed by my informants from Argentina and Venezuela. For them the pronominal variant tends to have the reading of ‘to boil over’:

- (26) El agua se hirvió (‘the water boiled (over)’) [non standard]

Sánchez López (2002: 91) denies the existence of a transitive variant for *enrojecer* (‘flush’), but this variant is attested in CREA:

- (27) a. *La vergüenza enrojeció a Juan (‘the shame flushed John’) (Sánchez López 2002: 91)
b. Se degustó una potente sangría, que enrojeció a más de uno los carrillos (CREA) (‘They tasted a strong sangria that made many of them rosy-cheeked’)

¹¹ The term is taken from Levin / Rappaport Hovav (1995). I will come back to its semantic implications in the next section.

To sum up this section: The contrast illustrated by BP *machucar* ('hurt') seems to correspond to a largely attested complexity concerning the anticausative variant of verbs entering the causative alternation. French, Italian, German and also Spanish exhibit verbs that allow for both the marked and the unmarked anticausative variant. In the next section, I will account for the differences of the two constructions in order to shed some light on to the given semantic contrast for *machucar*.

4. Semantic contrasts between the two anticausative constructions

4.1 Participant orientated differences

The BP data hint at a semantic difference concerning the 'responsibility' of the argument denoted by the subject of the two anticausative constructions. First of all, it has to be stated, that the contrast shown in the *machucar/salvar*-examples is far from being generalized neither in BP nor in any other (Romance) language. As far as BP is concerned, my informants would not exclude the pronominal construction with non animate subjects as the given *salvar*-data suggest:

- (28) a. A roupa (se) rasgou ('The clothes tore')
 b. A mesa (se) quebrou ('The table broke')
 c. A comida (se) estragou ('The food rotted')

It would be fruitless to adduce counter-evidence in order to prove that the contrast does not exist. Based on the given data, a more interesting point could be made by the Hypothesis II:

- (29) HYPOTHESIS II: If a contrast of responsibility is coded, the subject of the pronominal construction of a single verb will denote an argument more responsible for the outcome of the action than the argument denoted by the subject of the bare intransitive construction of the same verb.

Besides the given data for BP, there is evidence to prove the accuracy of Hypothesis II. The contrast is lexicalised with French *brunir* ('tan', 'brown') and with the corresponding German *bräunen*:

- (30) a. Les baigneurs brunissent ('The bathers got a tan')
 b. Les baigneurs se brunissent au soleil (Rothemberg 1974: 160)
 c. Le poulet brunit ('The chicken browned')
 d. *Le poulet se brunit

- (31) a. Paul s'est bruni pour paraître plus séduisant ('Paul got a tan to look more attractive')
 b. ??Paul a bruni pour paraître plus séduisant

The pronominal construction implicates an intentionally acting subject. On the contrary, the bare intransitive construction seems odd with such a subject.

- (32) a. Paul s'est bruni pour paraître plus séduisant ('Paul got a tan to look more attractive')
 b. ??Paul a bruni pour paraître plus séduisant

For other verbs which naturally take a human subject, these differences are subtle, but still detectable for native speakers. The following example from the CREA suggests a certain responsibility of the person denoted by the logical subject of the infinitive:

- (33) ... él prefirió empobrecerse poco a poco y continuar operando la cafetería, a venderla y quedarse rico (CREA) ('He preferred getting poorer and poorer keeping the coffee shop open to becoming rich by selling it')

My informants found the sentence less acceptable without the pseudo-reflexive. In the same sentence they preferred the pronominal construction in the following pair:

- (34) a. ??Juan empobreció por su propia culpa ('John impoverished by his own fault')
 b. Juan se empobreció por su propia culpa

Another piece of evidence stems from embedding constructions with MAKE. Folli (2002: 105ss) discusses the embedding under causative *fare* ('make') for Italian. In Italian the embedded infinitive appears obligatorily without the clitic:

- (35) a. La mamma fa pettinare Maria ('Mum makes Maria comb her hair')
 b. *La mamma fa pettinarsi Maria (Folli 2002: 104)

For class-A-verbs, Folli (2002: 105) observes that only a 'transitive' reading is available.

- (36) Maria fece chiudere la finestra
 => Maria made someone close the window
 => *Maria closed the window (Folli 2002: 105)

On the contrary, for class-B-verbs the test with embedding under *fare* shows ambiguity.

- (37) Maria fece diminuire la temperatura
 => a. Maria made the temperature decrease

=> b. Maria had someone decrease the temperature (Folli 2002: 122)

The same holds for class-C-verbs:

(38) Maria fece fondere il cioccolato

=> a. Maria made the chocolate melt

=> b. Maria had someone melt the chocolate (Folli 2002: 131s)

The Spanish class-C-verb *empobrecer* ('impoverish') seems to show the same contrast as Italian *fondere: hacer empobrecer* in the *a*-example is ambiguous. The construction could denote a process caused directly by the government itself or indirectly towards another causer, say the banking sector. The sentence in *b* is unambiguous: the government has to be interpreted as the direct causer.

(39) a. El gobierno hizo empobrecer a la clase media

=> The government impoverished the middle class

=> The government had someone impoverish the middle class

b. El gobierno empobreció a la clase media

=> The government impoverished the middle class

Notice that Spanish, in opposition to Italian, allows for the embedding of real reflexives without clitic-deletion:

(40) La madre le hizo peinarse a María ('Mum made Maria comb her hair')

The embedding of class-A-verbs under *hacer* ('make') is not very frequent, but well attested.

(41) a. Hizo buena carrera, pero en la última curva el patín se le fue mucho, lo hizo abrirse un poco y separarse de la baranda (CREA) ('He did a good race, but in the final curve the skate broke away, made straighten out a little bit and separate from the boards')

This example is not ambiguous: indirect causation can be excluded. As far as *empobrecerse* ('impoverish') is concerned, analogous examples read quite strangely in the eyes of my informants.

(42) #El gobierno hizo empobrecerse a la clase media ('The government made the middle class impoverish')

The example seems to suggest the interpretation that the middle class is indirectly caused by the government to impoverish on its own responsibility, an interpretation that does not make a lot of sense. Note that with *empobrecerse* intentional acting is not absolutely excluded. In this

case the pronominal construction could be considered a real reflexive construction and allows for embedding under *hacer*:

- (43) a. Jesús se empobreció por amor a vosotros (2 Cor 8,9) ('Jesus made himself poor out of love for you')
 b. Diós hizo empobrecerse a Jesús ('God caused Jesus to make himself poor')

To sum up, the preference for the embedding of the bare infinitive with a class-C-verb such as *empobrecer(se)* shows that a certain responsibility for her unintentional behaviour can be attributed to the human being denoted by subject of these verbs when they occur in the pronominal construction. This corroborates the findings for BP *machucar* ('hurt').

Schäfer (2008) adduces another complex piece of evidence for the same contrast. In German, only bare intransitive constructions allow for a dative causer. The contrast is subtle, but clear, when we exclude a *dativus incommodi* reading by adding *aus Versehen* ('by mistake'):

- (44) a. Die Flasche leerte sich mir (*aus Versehen)
 the bottle emptied itself to me by mistake
 b. Die Flasche lief mir aus Versehen aus
 the bottle leaked to me by mistake out
- (45) a. Dem Chemiker verflüssigte sich (*aus Versehen) das Präparat
 To the chemist liquidified itself by mistake the compound
 b. Dem Chemiker schmolz aus Versehen das Präparat
 To the chemist melted by mistake the compound
 (Schäfer 2008: 47)

As we have already seen, also bare intransitives entering the causative alternation permit a causative adjunct:

- (46) a. Marie a rougi de honte (Labelle 1992 : 401) ('Mary flushed with shame')
 b. El paro aumenta con la inflación (Sánchez López 2002: 89) ('The unemployment increases with the inflation')

If we consider these examples in line with Labelle (1992) and Sánchez López (2002) as instances of denoting internally caused eventualities, internal causation seems not to be incompatible with, in the words of Labelle (1992: 401), "the existence of a triggering cause", but the process that the subject-argument undergoes "is presented as happening autonomously". The dative causer could be considered another syntactical coding of a

triggering cause. Nonetheless, causative adjuncts can also be found with the pronominal construction:

- (47) a. Die Tür öffnete sich durch einen Windstoß (Schäfer 2008: 127)
The door opened itself by a blast
b. Toda la flota se hundió con el temporal (Sánchez López 2002: 80)
All the fleet SE sank with the storm

Hence, causation expressed by the dative causer has to be of another quality. Notice that this construction is neither available for French nor for BP. On the contrary, for Spanish and Italian the dative causer construction can be attested for both marked and unmarked anticausative constructions. According to Schäfer (2008: 69), the following examples can have a dative causer and not only a *dativus incommodi* reading:

- (48) a. A Juan se le rompieron las gafas
To John SE DAT-CL broke the glasses
b. A Juan le hirvió la leche
To John DAT-CL boiled-over the milk
(49) a. A Francesca le ruppe il vaso di cristallo per errore
To Francesca DAT-CL broke the cut glass by mistake
b. A Francesca è bollito fuori il latte per errore
To Francesca is boiled over the milk by mistake
(Schäfer 2008: 69)

Schäfer (2008: 66s) concludes that there is no semantic blocking at all, but a syntactic reason for the incompatibility of the dative causer with the pronominal construction in German: the dative causer and the pseudo-reflexive pronoun would have to be projected to the same specifier position, while the Spanish and Italian pseudo-reflexives are clitics that are attached to the verbal head. In this paper, I will not discuss the different syntactic representations that Schäfer's study focuses on.

If we consider the German data only, the contrast could be semantically interpreted in light of the *machucar*-alternation. If the pseudo-reflexive could hint at a higher degree of responsibility of the argument expressed by the subject in the sense of Hypothesis II, then there would be a cognitive dissonance with the dative causer that denotes the same semantic function. Of course, the Spanish and Italian data contradicts such an inference.

My Spanish informants corroborate the data given by Schäfer for *romperse* ('break'). As far as *hervir* ('boil') is concerned, they clearly prefer the non-standard pronominal variant, indicating that only this variant expresses the unintended change of state of boiling over. The intransitive variant would not make any sense to them.

- (50) a. A Juan se le hirvió la leche ('John involuntary caused the milk to boil over')
 b. #A Juan le hirvió la leche ('John involuntary caused the milk to boil')

Thus they interpret the anticausative alternation aspectually; an interpretation that has been put forward in the literature and that will be discussed in detail in the next section.

4.2 Aspectual differences

Although the given data from BP do not suggest any aspectual difference, this topic has to be briefly dealt with, since aspectuality has played a mayor role for the analysis of the causative alternation in Romance languages. Zibri-Hertz (1987) claims that the two constructions differ in telicity in French: marked anticausatives are supposed to be telic, unmarked anticausatives to be atelic. Sánchez López (2002: 86) adopts this analysis for Spanish. Following Fernández Lagunilla / de Miguel (1999), she highlights the fact that marked anticausatives denote a change of state of cumulative character and focus on a resulting state. This could be proved by the existence of a resultative construction with *estar* + participle that is excluded for at least some unmarked anticausatives:

- (51) a. Está hundido (Sánchez López 2002: 86) ('It is sunk')
 b. *Está ascendido (ibid. 92) (lit. 'It is ascended')

Folli (2002) bases her syntactic analysis of Italian anticausatives on aspectual ground:

- (52) a. La sedia si è rota in un secondo ('The chair broke in a second') (Folli 2002: 97)
 b. ?La sedia si è rotta, ma non è rotta ('The chair broke, but it is not broken') (ibid.: 98)
 (53) a. La temperatura è diminuita per un'ora ('The temperature decreased for an hour') (ibid. 118)
 b. La temperatura è diminuita, ma non è diminuita completamente ('The temperature decreased, but it has not totally decreased') (ibid. 120)

These data are to some degree problematic. By the way, "in un secondo" is not a spam of time that cumulative change of state could be perceived in. Hence, *rompersi* ('break') classifies rather as an achievement than as an accomplishment, but it is still a telic verb. Nonetheless, Schäfer (2008) adduces a set of counter-examples to Folli's claim:

- (54) a. La sua sfera d'influenza si è estesa per molti anni ('Her sphere of influence expanded for years')
- b. La sua sfera d'influenza si è estesa, ma non si è estesa completamente ('Her sphere of influence expanded, but is not yet completely expanded')
- (55) a. La caffettiera è scoppiata in un secondo ('The coffee machine exploded in a second')
- b. ??La caffettiera è scoppiata, ma non è scoppiata completamente ('The coffee machine exploded, but it has not completely exploded') (Schäfer 2008: 17s)

Also Labelle states:

It is not the case that the intransitive construction expresses the imperfectivity or atelicity of the process, while the reflexive construction expresses the perfectivity of [sic] telicity of the process. (Labelle 1992: 195).

But otherwise she assumes that:

The aspectual flavour of the distinction between the intransitive construction and the reflexive construction is an indirect consequence of the semantics of the constructions. (Ibid.).

My informants clearly prefer the marked construction of class-C-verbs in telic contexts as we have already seen for *hervir* ('boil') versus *hervirse* ('boil over'):

- (56) a. Con el gobierno peronista la clase media se ha empobrecido en pocos años ('With the peronist government the middle class impoverished in a few years')
- b. ?Con el gobierno peronista la clase media ha empobrecido en pocos años
- c. La clase media ha empobrecido pero todavía no es pobre ('The middle class has impoverished, but is not yet poor')
- d. ?La clase media se ha empobrecido pero todavía no es pobre

Their intuitions can be captured by Hypothesis III:

- (57) HYPOTHESIS III: If an aspectual contrast is coded with the same verb, the pronominal construction will be interpreted as telic, the bare intransitive construction as atelic.

4.3 Interim Conclusion

Starting from the BP data, slight but consistent semantic tendencies between the two anticausative constructions have been observed. The three hypotheses put forward throughout this paper interlock in an organic way. The pronominal construction is – paradoxically– the more causative one of the two anticausative constructions. The different degrees of causativity of the subject argument of intransitive constructions could be brought into a hierarchical order:

(58) a. REAL REFLEXIVES WITH INTENTIONAL DIRECT CAUSER

Example: *Jesus se empobreció por amor a vosotros* ('Jesus made himself poor out of love for you')

>

b. MARKED ANTICAUSATIVES WITH INTENTIONAL INDIRECT CAUSER

Example: *Paul s'est bruni pour paraître plus séduisant* ('Paul got a tan to look more attractive')

>

c. MARKED ANTICAUSATIVES WITH UNINTENTIONAL RESPONSIBLE CAUSER

Examples: *Luis se machucou por causa de uma imprudência preparando sushi* (lit. 'Louis hurt himself because of carelessness preparing sushi') / *Juan se empobreció por su propia culpa* ('John impoverished by his own fault')

>

d. INTERNAL CAUSATION

Examples: *Luis machucou por causa da queda* (lit. 'Louis hurt because of the tumble') / *La voiture ralentit* ('the car slowed down') (Rothemberg 1974:192)

>

e. GENERIC EXTERNAL CAUSATION

Example: *La production se ralentit* ('the production slowed down') (Rothemberg 1974:192)

>

f. REFLEXIVE PASSIVES

Example: *se firmaron los convenios* ('the treaties were signed')

I would like to make two comments. First, the hierarchy reflects contrasts as far as they are coded. That means that the BP example *o arquivo salvou rapido* ('the file saved quickly') should not be interpreted as an instance of internal causation. BP shows a tendency to loose pronominal constructions. Therefore, it may resemble English in the way that the difference between external and internal causation will (generally) not be expressed by morphological marking.

Second, the preference found in the Spanish data for combining the marked construction with a dative causer (see above: *A Juan se le hirvió la leche*) obviously contradicts the German data if we take them as evidence for a higher degree of causativity in the marked construction.¹² The Spanish data should be seen, too, in the light of general tendency, a tendency that is exactly opposed to the one observed for BP. In Spanish the pronominal

¹² As far as I can see, there is no syntactic explanation of theses facts in line with Schäfers' approach (Schäfer 2008), neither.

construction seems to extend to almost all anticausatives. If the contrast of the two constructions can be used to code differences in causativity – as we have seen for *empobrecer(se)* (‘impoverish’) – this coding seems to neutralise in contexts of a dative causer interpreted as an unintentional external non-generic causer. The pseudo-reflexive does not code any higher degree of causativity in these contexts, but operates as an aspectual marker. The fact that higher perfectivity is in line with higher causativity (expressed by the dative causer) could be explained by the general affinity of causation and telicity. Most causative constructions are telic, although caused atelic states (*the dogs frightened the boy*) or activities (*The girl bounced the ball around*) could be attested (cf. Van Valin / LaPolla 1997: 97).

5. The Theta-System revisited

The modelling of the semantic findings of the last section within a linking theory will be effected in two steps. First I would like to shed some light on the formal coding of semantic roles. My considerations are inspired by Rozwadowska (1988) and Reinhart (2002). The different degrees of causativity will be coded by means of the feature-value calculus developed for verbs of emotion in Kailuweit (2005). In a second step the calculus will be integrated in a linking theory based on Role-and-Reference-Grammar (Van Valin / LaPolla 1997; Van Valin 2005).

In Kailuweit (2005), I suggested a feature based graduation to determine the argument’s activity degree for verbs of emotion. The calculus is based on three features – cause [c], mental [m] and result [r] – that could take the values +, – and \pm . [c] is a strong proto-agent feature, [m] is a weak proto-agent feature and [r] is a strong proto-patient feature. The presence [+] of a strong feature will duplicate the value of the presence of a weak feature. If an argument is underspecified for one feature [\pm] the value will be half.

+c	\pm c	–c	+m	\pm m	–m	–r	\pm	+r
4	2	0	2	1	0	0	–2	–4

Fig.1: Theta-features and values

Reinhart (2002) assumes that all transitive verbs taking a [+c, \pm m]-argument as subject enter the causative alternation. She does not distinguish between different variants of anticausatives. Therefore, she proposes a simple rule for the reduction of the external argument. The only

distinction she makes consists in the nature of the object-argument of the transitive construction.

- (59) a. $\text{open}_{\text{acc}}([+c], [-c-m]) \dashrightarrow R_e(\text{open})[-c-m]$
 b. $\text{worry}_{\text{acc}}([+c], [-c+m]) \dashrightarrow R_e(\text{worry})[-c+m]$ (Reinhart 2002)

It is beyond the focus of this paper to comment on verbs of emotion although some of them show interesting parallelisms to change of state verbs entering in the causative alternation. In Kailuweit (2005), I have argued that the Romance pseudo-reflexive constructions of the *worry*-type are instances of anti-passive constructions. I will not repeat this argumentation here.

As far as the causative alternation is concerned, Reinhart's analysis is by far too coarse-grained. Nonetheless, her analysis of real reflexives will serve as a starting point for a finer grained formalisation of the results already obtained in the last section.

- (60) a. $\text{shave}_{\text{acc}}([+c+m]_1, [-c-m]_2)$: *Lucie shaved him*
 b. $R_s(\text{shave})([+c+m]_1)$: *Max shaved* (Reinhart 2002)

For Reinhart (2002) real reflexives always reduce the object argument. Since this paper does not focus on real reflexives, I would like to agree with this analysis without further discussion,¹³ adding just the missing third feature [r] that will be necessary for the distinction of finer linking differences:

- (61) a. $\text{machucar}_{\text{acc}}([+c+m-r]_1, [-c-m+r]_2)$: *João machucou Luis*
 b. $R_s(\text{machucar})([+c+m-r]_1)$: *Luis se machucou intencionalmente*

The transitive construction shows the highest possible activity contrast. A prototypical controlling agent and causer ([+c+m-r]) brings about a change of state in a prototypical causatively affected patient [-c-m+r]. The semantics of the agent is not changed by the reflexive construction.

On the contrary, the semantics of the marked anticausative variant of *brunir* ('tan') can not be described correctly, if we just adopt Reinhart's proposal of a deletion of the argument realized as subject of the transitive variant. The subject of the marked anticausative construction is obviously not a prototypical patient, but an intentional indirect causer of the change of state. Although he would not get a tan without the help of the sun, he is exposing his body intentionally. Hence the object argument of the transitive construction is semantically

¹³ This analysis is not without problems for Italian (cf. Müller 2005).

promoted. He becomes an indirect causer of the change of state that his body undergoes. Notice that the argument takes the value \pm for the r-feature. This corresponds to the fact that the argument undergoes a change of state, but is not prototypically causatively affected. We are dealing with an anticausative construction. Hence, neither the c-feature nor the r-feature could reach a +-value:

- (62) a. *brunir*_{acc} ([+c+m-r]₁, [-c-m+r]₂): *Le soleil a bruni Paul*
 b. *brunir* ([\pm c+m \pm r]₁): *Paul s'est bruni pour paraître plus séduisant*

The human being denoted by the subject of *machucar-se* ('hurt') in BP does not intentionally bring about the change of state that he is the victim of. Nonetheless, his responsibility can be coded by \pm value for the m-feature:

- (63) a. *machucar*_{acc} ([+c+m-r]₁, [-c-m+r]₂): *João machucou Luis*
 b. *machucar* ([\pm c \pm m \pm r]₁): *Luis se machucou por causa de uma inadvertência preparando sushi*

Unmarked anticausative constructions denoting internal causation do not code any responsibility of the human being or object denoted by the subject-argument. This is coded by a -value for the m-feature. It could be argued that a human being has intrinsic properties that lead to injuries when falling down, especially from a roof as suggested by the given BP data:

- (64) a. *machucar*_{acc} ([+c+m-r]₁, [-c-m+r]₂): *João machucou Luis*
 b. *machucar* ([\pm c-m \pm r]₁): *Luis machucou por causa da queda*

A slightly more passive argument appears in the subject position of marked anticausatives. As these constructions denote typically external causation, the c-feature takes the -value. Note that the telicity-effect is not due to a higher value for the r-feature. This is in line with the argumentation of Labelle (1992) and Schäfer (2008). Telicity is only an indirect effect of the higher patienthood of the argument due to its c-feature-value:

- (65) a. *ralentir*_{acc} ([+c+m-r]₁, [-c-m+r]₂): *La crise économique ralentit la production*
 b. *ralentir* ([\pm c-m \pm r]₁): *La production se ralentit*

To leave the semantic field of anticausatives to the bottom side, last but not least reflexive passives take a prototypical patient subject [-c-m+r], an argument that ranks at the lower pole of the activity hierarchy. It is identical to the object argument of the corresponding active transitive construction:

- (66) a. *firmar*_{acc} ([+c+m-r]₁, [-c-m+r]₂): *Los ministros firmaron los convenios*

b. firmar ([-c-m+r]₁): *Los convenios se firmaron*

The following table will sum up the causativity-degree hierarchy:

[+c+m-r]	6	<i>Luis se machucou intencionalmente</i>
[±c+m±r]	2	<i>Paul s'est bruni pour paraître plus séduisant</i>
[±c±m±r]	1	<i>Luis se machucou por causa de uma inadvertência preparando sushi</i>
[±c-m±r]	0	<i>Luis machucou por causa da queda</i>
[-c-m±r]	- 2	<i>La production se ralentit</i>
[-c-m-r]	- 4	<i>Los convenios se firmaron</i>

Fig. 2: Anticausative constructions in the centre of an activity hierarchy

Note that the same verb *machucar* ('hurt') appears in three different constructions. This raises the question whether the linking between the semantics of each sentence and the syntactic construction is determined by different lexical entries or whether the constructions interfere to convey a certain interpretation. This question will be dealt with in the final section of this paper.

6. A constructionist RRG approach

A projectionist approach has been put forward by Levin / Rappaport Hovav (1995): The meaning of a sentence and the linking of the arguments of the predicate is determined by the meaning of the predicate. Hence, each verb should classify as denoting either externally caused or internally caused eventualities. On the contrary, a constructionist view of the anticausative alternation can already be found in Rothemberg (1974):

Un même verbe peut également se trouver dans l'une ou l'autre construction avec le même sujet [...] on peut rencontrer aussi bien *l'effort ralentit* que *l'effort se ralentit*, dans le premier cas, par l'emploi de l'intransitif, le processus est considéré comme un processus naturel se réalisant uniquement grâce aux qualités inhérentes du sujet [...] alors que dans le second cas on tient pour indispensable l'intervention d'autres facteurs... (Rothemberg 1974 : 192).

[The same verb can equally enter one or the other construction with the same subject [...]. We can find just as well *l'effort ralentit* as *l'effort se ralentit*, in the first case, the uses of the intransitive marks that the process is considered naturally developing only because of the inherent qualities of the subject [...] where as in the second case we consider the intervention of other factors as indispensable.]

In this section, I will sketch a constructionist approach to linking based on the semantics-to-syntax algorithm of RRG (Van Valin 2005). The organisation of RRG stipulates the existence of constructional schemas that intervene during the linking process in order to spell out the language specific characterization of a special construction. It always consists of a list of

syntactic, morphologic, semantic and pragmatic particularities that characterize the specific construction in a specific language.

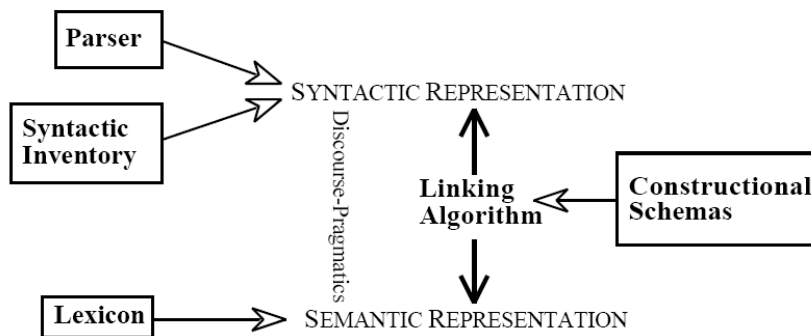


Fig. 3: Organisation of RRG (Van Valin 2005: 134)

My claim will be that the two anticausative variants could be represented as constructional schemas that interact with the information stored in lexical entries. As one could infer from the lists given in section 2, there are for many verbs, language specific arbitrary restrictions that determine whether the verb enters the pronominal construction, the bare infinitive construction or both. These idiosyncracies have to be stored in the lexicon. Verbs that potentially enter both constructions are lexically underspecified. Their lexical entry does not have to be doubled, but the semantic differences will be conveyed by a specific constructional schema.

Although anticausative constructions are not universal syntactic devices, but at least morphologically, syntactically and semantically language specific phenomena,¹⁴ they can be considered voice constructions and imply a universal argument reduction rule:

- (67) General characterization of basic voice constructions:
- a. Privileged Syntactic Argument [PSA] modulation voice: permits an argument other than the default argument [...] to function as PSA.
 - b. Argument modulation voice: gives non-canonical realization to a macrorole argument.
- (cf. Van Valin 2005: 100? = 4.41)

The general linking algorithm from semantics to syntax stipulates to choose an appropriate syntactic template for a semantic representation by following general rules:

- (68) a. Syntactic template selection principle:
- The number of syntactic slots for arguments and argument-adjuncts within the core is

¹⁴ I will not deal with any pragmatic difference in this paper.

equal to the number of distinct specified argument positions in the semantic representation of the core.

b. Language-specific qualifications of the principle in (a):

1. All cores in the language have a minimum syntactic valence of 1.
2. Argument-modulation voice constructions reduce the number of core slots by 1.
[...]

(Van Valin 2005: 113?: =5.2)

Therefore, for both constructions the general rules stipulate the realization of the non-Actor-argument as subject (= PSA) and the reduction of the core slots to one. The constructional schemas intervene in order to spell out the language specific characterizations of a voice construction. In the present sketch I will restrict myself to anticausative constructional schemas for Spanish, French and BP:

(69) CONSTRUCTION: Spanish marked anticausatives

SEMANTICS:

Actor: deleted; Undergoer [-c-m+r]: promoted => {[-c-m±r] v [±c-m±r] v [±c±m±r] v [±c+m±r]};
telecity: (+)

SYNTAX:

PSA: Undergoer; Intransitivity: unaccusative; Dative causer: +

MORPHOLOGY:

Marking: reflexive

PRAGMATICS:

...

(70) CONSTRUCTION: Spanish unmarked anticausatives

SEMANTICS:

Actor: deleted; Undergoer [-c-m+r]: promoted => [±c-m±r]; telecity: (-)

SYNTAX:

PSA: Undergoer; Intransitivity: unaccusative; Dative causer: (+)

MORPHOLOGY:

Marking: -

PRAGMATICS:

...

(71) CONSTRUCTION: French marked anticausatives

SEMANTICS:

Actor: deleted; Undergoer [-c-m+r]: promoted => {[-c-m±r] v [±c±m±r] v [±c+m±r]}; telecity: (+)

SYNTAX:

PSA: Undergoer; Intransitivity: unaccusative; Dative causer: -

MORPHOLOGY:

Marking: reflexive

PRAGMATICS:

...

(72) CONSTRUCTION: French unmarked anticausatives

SEMANTICS:

Actor: deleted; Undergoer [-c-m+r]: promoted => [\pm c-m \pm r]; telecity: (-)

SYNTAX:

PSA: Undergoer; Intransitivity: unergative;¹⁵ Dative causer: -

MORPHOLOGY:

Marking: -

PRAGMATICS:

...

(73) CONSTRUCTION: BP marked anticausatives

SEMANTICS:

Actor: deleted; Undergoer [-c-m+r]: promoted => {[-c-m \pm r] v [\pm c \pm m \pm r] v [\pm c+m \pm r]}; telecity: (+)

SYNTAX:

PSA: Undergoer; Intransitivity: unaccusative;¹⁶ Dative causer: -

MORPHOLOGY:

Marking: reflexive

PRAGMATICS:

...

(74) CONSTRUCTION: BP unmarked anticausatives

SEMANTICS:

Actor: deleted; Undergoer [-c-m+r]: promoted => {[-c-m \pm r] v [\pm c-m \pm r]}; telecity: (-)

SYNTAX:

PSA: Undergoer; Intransitivity: unaccusative;¹⁷ Dative causer: -

MORPHOLOGY:

Marking: -

PRAGMATICS:

...

As far as language specific particularities are concerned, the constructional schema accounts for syntactical differences, such as the lack of a dative causer construction in French and BP or the unergativity of French unmarked anticausatives, if we follow Labelle's argumentation. Nonetheless, the paper is mainly concerned with language specific semantics. The different accessible semantic interpretations of the two constructions in each language can be inferred from the schemas.

¹⁵ According to Labelle (1992).

¹⁶ According to Carvalho (2006).

¹⁷ According to Carvalho (2006).

The difference of internal versus external causation can be captured by the different kinds of undergoer promotion. While the unmarked anticausatives in Spanish and French convey a type of undergoer promotion [$\pm c-m\pm r$] that corresponds to the semantics of internal causation, marked anticausatives in French are restricted to the three other types of undergoer promotion. On the contrary, Spanish marked anticausative constructions allow for expressing eventualities of internal causation, too. In BP it is the other way round: unmarked anticausative constructions denote both internal causation and external causation, as illustrated by given data for *saltar*.

Conclusion

(Anti-)causative variation is more complex than the well-known distinction of internal versus external causation suggests. Anticausatives differ from passives by the fact that their argument is semantically promoted in comparison with the object argument of the transitive construction. The argument denotes neither a prototypical patient nor a prototypical causer. In many languages anticausatives split into three classes. It has been proved that this is also the case for Spanish. The semantics of anti-causativity are an effect of the constructions that an individual verb can enter. Marked and unmarked constructions vary according to the language in the degree of causativity-promotion they convey to the undergoer-argument of the transitive construction. It has been proven that RRG's constructional schemas are a powerful tool to deal with a fine-grained semantic and syntactic analysis of anticausative constructions.

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Modality in Taiwan Sign Language

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Abstract

This paper discusses modality in TSL within the framework of Role and Reference Grammar (Van Valin and LaPolla 1997; Van Valin 2005), with the goal of finding out what is the correlation between semantics and syntactic representation of modals. It is found that the modal with wider semantic scopes (e.g., epistemic modal) has more flexible syntactic distribution than the modal with narrow semantic scope. In addition, the modal with wider semantic scope (e.g., epistemic modal) always has to precede the modal with narrow semantic scope (e.g., deontic modal). Further, it is shown that the different syntactic positions of the modal convey different degree of subjectivity. The modal in the clause-final position is usually incorporated with non-manual features to convey stronger subjectivity.

Key words: signed languages, Taiwan Sign Language, modality, epistemic modals and deontic modals

1. Introduction

Modality is a grammatical category on a par with tense and aspect. Tense is concerned with anchoring events in time, while aspect is concerned with the internal temporal structure of events (Comrie 1976, 1985). Modality differs from tense and aspect in that it does not refer to the properties of the event, but rather to the speaker's attitude to the proposition in the sentence. Specifically, modality is defined as the grammaticalization of speakers' attitudes and opinions (Lyon 1977; Palmer 2001). In spoken languages, modality can be coded in a variety of ways, such as morphological inflection, lexical items, syntactic patterns, and intonation (Bybee and Fleischman 1995). For example, English mainly resorts to modals to distinguish a judgment about a proposition from a statement. Compare the sentence (1a), without modal, with the other two. The sentence (1a) is a statement without involving the speaker's attitude, while in (1b) and (1c), the modals, "may" and "must", are used to express the

speaker's attitude to a proposition. The modal "may" in (1b) conveys the speaker's lack of confidence in the proposition, while "must" in (1c) conveys the speaker's confidence in what he is saying.

- (1) a. Kate is sick today.
b. Kate [**may**] be sick today.
c. Kate [**must**] be sick today.

Forty some years of research shows that signed languages are natural languages and represented in visual-gestural mechanism (Stokoe 1960, Stokoe et al. 1965, Kilma and Bellugi 1979, Lillo-Martin 1999, 2002; Meier 2002). It has come to be recognized that modality is a cross-language grammatical category, and signed languages thus have no exception. In signed languages, modality can be expressed at least through the two manual ways, as well as one non-manual way. The first manual way is to use lexical items (e.g., British Sign Language (BSL) uses modals such as "SHOULD", "CAN" and "MUST") (Sutton-Spence and Woll 1999: 126). The second manual way is to vary the tenseness, strength, and size of the verb sign (e.g., In BSL, the expression of "MUST^ASK" is larger, tenser and stronger than "COULD^ASK") (Sutton-Spence and Woll 1999:126). The third way is to incorporate non-manual features into the sentence, such as head nodding, chin up and so forth (Wilcox and Wilcox 1995). This paper will focus on how Taiwan Sign Language (TSL) users resort to modals to express modality.

Modality in signed languages has been analyzed in many different ways. For example, some studies elucidate the expression of modality (Fisher and Gough 1978; Padden 1988; Ferreira-Brito 1990; Wilcox 1996; Sutton-Spence and Woll 1999). Others explore the grammaticalization of modals (Wilcox and Wilcox 1995; Wilcox and Wilcox 1995; Shaffer 2000; 2002; Janzen and Shaffer 2002; Meir 2003; Wilcox and Shaffer 2005). Still others investigate the syntactic distribution of modals (Aarons, Bajan, Kegl and Neidle 1995; Shaffer 2004). However, only few of studies notice the correlation between semantics and syntactic representation of modals, and offer a theoretically uniform account.

This paper discusses modality in TSL within the framework of Role and Reference Grammar (Van Valin and LaPolla 1997; Van Valin 2005), with the goal of finding out how modals are represented in the layered structure. In TSL, the different syntactic positions of the modals convey different degree of subjectivity, as shown in (2) and (3). The sentences with the modal 'ABLE', as in (2) and (3), only differ in the syntactic positions. But the sentence with the modal in the clause-final position, as in (3) conveys stronger subjectivity. The first issue of this paper will discuss the

syntactic distribution of modals and its correlation with speakers' subjectivity.

(2) ECONOMY SITUATION BAD, POOR^PEOPLE GOVERNMENT [**ABLE**]

TAKE-CARE+POOR^PEOPLE_{CL}¹

'Due to economic recession, the government will take care of the poor.'

(3) ECONOMY SITUATION BAD, POOR^PEOPLE GOVERNMENT

TAKE-CARE+ POOR^PEOPLE_{CL} [**ABLE**]

'Due to economic recession, it is obligatory for government to take care of the poor.'

Some spoken languages allow only one modal in a sentence, such as Standard English, while some spoken languages allow double modals in a sentence, such as Catalan, Iceland, Chinese, English dialects in the southern United States, and so on (DiPaolo 1989; Nagle 2003). TSL allows double modals in a sentence, and the word order of modals is closely related to their interpretations, as exemplified in (4) and (5). (4) and (5) only differ in the word order of the modals. But the sentence with "SURE" preceding "CAN" conveys the speaker's stronger confidence in what he is saying than the reverse order in (5). The second issue will focus on what are the word orders and semantic scopes of modals in TSL, when a clause involves two modals.

(4) (SURE > CAN)

HE GO TAIPEI [**SURE**] [**CAN**].

'It is sure that he is allowed to go to Taipei.'

(5) (CAN > SURE)

HE GO TAIPEI [**CAN**] [**SURE**].

'It is probable that he will go to Taipei.'

To explore the issues raised above and provide a satisfactory account of them, this study presents a discourse-based exploration of modality in TSL. Some of data are from short discourses elicited from the individual informant.² Some are excerpted from the Signed Language News of Public Television Service (PTS) which broadcasts news in TSL for the deaf and hearing impaired citizens in Taiwan. All the instances of modals are analyzed and categorized according to their discourse functions and syntactic positions.

¹ The notation "CL" stands for "classifier predicate" in signed languages. For more related discussion, please check Chang, Su and Tai (2005).

² We are grateful to Yu-shan Ku for providing the TSL data in this paper.

The rest of this paper is organized as followings: Section 2 introduces a theoretical background; section 3 discusses the syntactic distribution of modals and its correlation with subjectivity; section 4 investigates the word orders and semantic scopes of modals; section 5 is concluding remarks.

2. Theoretical background

Role and Reference Grammar (RRG) developed by Van Valin mainly investigates the interaction between structure, meaning, and communicative function in human language (Van Valin and LaPolla 1997; Van Valin 2005). Thus, RRG postulates three primary representations: (a) a syntactic representation which closely corresponds to the actual form of utterance; (b) a semantic representation which represents the meaning of linguistic expression; (c) a representation of information structure which is related to communicative function (Van Valin 2005:1). In addition, there is a set of linking algorithms which links both from syntactic to semantics and from semantics to syntax, and discourse-pragmatics plays a role in the linking. This paper will emphasize the syntactic representation of a clause.

In RRG, the syntactic representation of a clause structure is called “the layered structure of the clause” which is determined by two constrains: (a) predicate or non-predicate; (b) argument or non-argument. In the layered structure of the clause, *nucleus* (NUC) is the primary element which contains a predicate realized by a verb. The next layer is the *core* (CORE) which contains a *nucleus* and the core arguments of predicate. The non-argument of predicate is termed as *periphery* (PERIPHERY). The *periphery* joints to *core* to form the unit *clause* (CLAUSE). As summarized in following Table (1).

Semantic element(s)	Syntactic unit
Predicate	Nucleus
Argument in semantic representation of predicate	Core argument
Non-arguments	Periphery
Predicate + Arguments	Core
Predicate + Arguments + Non-arguments	Clause (= Core + Periphery)

Table (1): Semantic units underlying the syntactic units of the layered structure of the clause

(Van Valin and LaPolla 1997:27)

It is worthy noting that this syntactic representation consists of two types of projection. One is a constituent projection which deals with verbs, arguments, and

adjuncts, and the other is an operator projection which deals with functional categories such as modality, aspect, negation, tense and so forth.

As far as the operator projection is concerned, each layer may be modified by one or more operators. The scope of nucleus operators is over NUC; thus, they modify the action, event or state without reference to the participants. Core operators modify the relation between a core argument, involving the actor and the action. Clausal operators modify the entire clause as a whole. In other words, the operator projection mirrors the constituent projection in terms of layered structure. How operators are represented in the layered structure of a clause is summarized as in Table (2). Table (2) shows that “aspect” is a nuclear operator, “directionals” can be a nuclear or a core operator, and “negation” can be any of three layers. As for event quantification and modality, they belong to core operators and their scopes are over an event. The operators, like “tense”, “status”, “evidentials”, and “illocutionary force”, are clausal operators, and modify the entire proposition as a whole.

<u>Nuclear operator</u>
Aspect
Negation
Directionals
<u>Core operators</u>
Directionals
Event quantification
Modality (root modals, e.g., ability, permission, obligation)
Internal negation
<u>Clausal operator</u>
Status (epistemic modals, external negation)
Tense
Evidentials
Illocutionary force

Table (2): Operators in layered structure of the clause

(Van Valin 2005:9)

This section introduces Role and Reference Grammar, especially for its syntactic representation. RRG is characterized by its layered representation, and its operator projection will be used to account for modality in TSL. In the following section 3, the syntactic distribution of modals and its correlation with speakers’ subjectivity will be elucidated.

3. Syntactic positions and subjectivity in TSL

3.1 Syntactic distribution of modals

Following Palmer (1979), modality can be classified into deontic and epistemic modality. Epistemic modality is concerned with the speaker's degree of commitment to the truth of the proposition (Payne 1997:246). Deontic modality is concerned with permission or obligation for the performance of actions (Hoye 1997:43). Simply speaking, epistemic modality conveys necessity or possibility, while deontic modality denotes permission and obligation. The sentences in epistemic sense and deontic sense are given in (6) and (7). The sentence (6) denotes an epistemic sense, since the modal "may" conveys the speaker's inference of the proposition. The sentence (7) conveys a deontic sense, since the modal "can" is used to signify the speaker's permission of the event.

(6) Mark [**may**] be in his office. [Epistemic modality]

(7) John [**can**] take a ten-minute break. [Deontic modality]

Like spoken languages, it has been noted that signed language also have this two-way distinction in modality (Wilcox and Wilcox 1995; Shaffer 2000; 2002; Janzen and Shaffer 2002; Wilcox and Shaffer 2005). As far as the syntactic distribution of modals is concerned, it has been suggested by Shaffer (2000) that modals in American Sign Language (ASL) can occur in the clause-initial position, the preverbal position, and the clause-final position. She also points out that there is an iconic correlation between modals' semantics and their syntactic representation. That is, in ASL the modal with lower subjectivity (e.g., deontic modal) tends to occur in the preverbal position, while the modal with higher subjectivity (e.g., epistemic modal) tends to occur in the postverbal position. It seems that there is a correlation between the syntactic positions and the degree of subjectivity. However, the syntactic distribution of modals in TSL does not closely comply with Shaffer's generalization. In TSL, the epistemic modals can occur in the pre-verbal position, the clause-final position, and the clause-initial position, as in (8)-(10). The modal "MUST" in (8) conveys necessity of the proposition, while the modals in (9) and (10) convey possibility of the proposition.

(8) In the preverbal position:³

NIGHT DRIVE [**MUST_E**] LIGHT.

‘Driving in the night, you must turn on the light.’

(9) In the clause-final position:

MAY JUNE PLUM^RAIN TIME [**SHOULD_E**].

‘May and June should be the raining seasons.’

[PTS Sign Language News 20090602]

(10) In the clause-initial position:

NOW AIRPLANE WRECKAGE PART FIND-OUT.

[**MAYBE_E**] AIRPLANE PEOPLE TOTAL 228 HEALTHY DIFFICULT.

‘Parts of the aircraft’s wreckage were found out now. The 228 people may have died in the crash.’

[PTS Sign Language News 20090603]

As for deontic modals, they can occur in the pre-verbal position and the clause-final position, as in (10) and (11). Both modals “CAN” and “SURE” convey the speaker’s permission for the event.

(10) In the preverbal position:

FILM PEOPLE [**CAN_D**] ENTER LOOK-FOR FILM-EDITING SUPPORT AND-SO-FORTH.

‘The film staffs are allowed to enter (the center), and look for support such as film editing and so forth. ’

[PTS Sign Language News 20090602]

(11) In the clause-final position:

NOW SENIOR-HIGH-SCHOOL STUDENT NOON GO-OUT EAT [**SURE_D**].

‘Senior high school students are allowed to eat out by noon now.’

[PTS Sign Language News 20090603]

The syntactic distribution of deontic modals and epistemic modals are summarized as in Table (3). Based on a study of word order of clauses in ASL, it has been proposed that lexical category in ASL is head-initial, while functional category

³ The subscript capital “E” stands for epistemic modal, and the subscript capital “D” stands for deontic modal.

is head-final (Romano 1991). However, as far as TSL’s modality is concerned, it seems to involve both head-initial and head-final properties, thus, modals can occur in the preverbal position, or follow the verb in the clause final position.

Syntactic distribution	Clause-initial	Preverbal	Clause-final
Epistemic modal	✓	✓	✓
Deontic modal		✓	✓

Table (3): The syntactic distribution of modals in TSL

This paper deals with the modality in TSL; however, the definition of modality is slightly different from RRG’s terminology. In RRG, the operator “modality” limitedly refers to the root modality conveying the sense of ability, permission, and obligation. (Van Valin and LaPolla 1997:41). That is, the deontic modality in our discussion is categorized as the operator “modality” (MOD) in RRG, indicating the relationship between the referent of the subject and the action. As for epistemic modality, it is categorized as in RRG’s operator “status” (STA), conveying the sense of necessity and possibility. To put it simply, the deontic modals correspond to the operator “modality” (MOD), and the epistemic modals to the operator “status” (STA).

Figure (1) demonstrates how epistemic and deontic modals are projected onto the syntactic representation. Due to different semantic scopes, the modals belonging to core operator “modality” (MOD) can occur either pre-verbally or clause-finally (i.e., deontic modal), and the modals belonging to clausal operator “status” (STA) can occur in the clause-initial position, the clause-final position, and the pre-verbal position. It shows that the modal with wider semantic scope (e.g., clausal operator) has more flexible syntactic distribution than the one with narrow semantic scope (e.g., core operators).

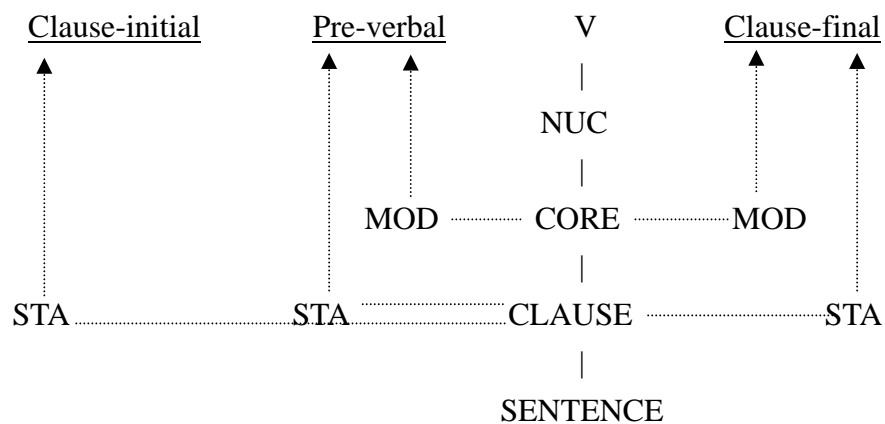


Figure (1): The syntactic representation of modals in TSL.

3.2 Syntactic positions and subjectivity

Lyons (1977:739) defines subjectivity as devices whereby the speaker, in making an utterance, simultaneously comments upon that utterance and expresses his attitude to what he is saying. It has been suggested that modality is concerned with the grammaticalization of speakers' attitudes and opinions, that is to say, modality conveys subjectivity characteristic of an utterance. Subjectivity can certainly be regarded as an essential feature of epistemic modal since it is related to the speaker's judgments based on his own beliefs. Deontic modal, like epistemic modality, it also involves subjectivity in that the speaker is the one who obliges, permits, or forbids. In brief, modality is related to speaker's subjectivity, and deontic and epistemic modal are different in the degree of subjectivity. Deontic modal is semantically weaker in subjectivity than epistemic modal.

In addition, the modals differ in the degree of subjectivity can also be proved diachronically. The deontic sense has been shown to be developed earlier than epistemic one (Shepherd 1982; Traugott 1989; Byee, Perkins and Pagliuca 1994). As noted by Traugott (1989), as an element grammaticalized within constructions, its meaning tends to become increasingly based in the speaker's subjectivity belief state or attitude toward the proposition. Epistemic modal is developed later than deontic one, thus the former is stronger in subjectivity than the later.

Like spoken languages, Wilcox (1996) and Shaffer (2000, 2002) have proved that in ASL epistemic sense of modals develop later than, and out of, the deontic one. In addition, Shaffer (2004) proposes that there is an iconic relationship between the expression of speaker subjectivity and information ordering in ASL. She draws a conclusion that epistemic modals, higher in speaker subjectivity, occur in the clause-final position, while modals serving more prototypical agent-oriented functions can only occur in the preverbal position, profiling their relationship to the verbal action (Shaffer 2004:117-118). In TSL, the syntactic distribution of modals is more flexible than ASL and also exhibits a correlation between the syntactic distribution and the degree of subjectivity to certain degree, as shown in (12) and (13). The sentences with the deontic modal 'ABLE', as in (12a) and (12b) only differ in the syntactic positions. But the sentence with the modal in the clause-final position, as in (12b) conveys stronger subjectivity. The non-manual features (e.g., upward-backward head tilt, chin up) are incorporated into the clause-final deontic modal to show the stronger subjectivity, as given in Figure (3).

Deontic modal

(12) The preverbal position:

ECONOMY SITUATION BAD, POOR^PEOPLE GOVERNMENT [**ABLE**_D]

TAKE-CARE+ POOR^PEOPLE_{CL}

‘Due to economic recession, the government will take care of the poor.’

(13) The clause final position

ECONOMY SITUATION BAD, POOR^PEOPLE GOVERNMENT

TAKE-CARE+ POOR^PEOPLE_{CL} [**ABLE**_D]

‘Due to economic recession, it is obligatory for the government to take care of the poor.’



Figure (2) ABL (from (12))



Non-manual features:
upward-backward head tilt,
chin up

Figure (3) ABL (from (13))

Like deontic modals, epistemic modals also reflect different degree of subjectivity along with the different syntactic positions, as exemplified in (14) and (15). The sentences with the epistemic modal ‘MUST’, as in (14) and (15) only differ in the syntactic positions. The sentence with the modal in the clause final position, as in (15) conveys stronger subjectivity. The non-manual features (e.g., upward-backward head tilt, chin up) are incorporated into the clause-final epistemic modal to represent the stronger subjectivity.

Epistemic modal

(14) The preverbal position:

SISTER STUDY DILIGENT. SHE [**MUST**_E] EXAM SUCCESS

‘My sister studies so hard. She can pass the exam.’

(15) The postverbal position:

SISTER STUDY DILIGENT. SHE EXAM SUCCESS [**MUST**_E]

‘My sister studies so hard. She surely can pass the exam.’



Figure(4) MUST (from (14))

Figure(5) MUST (from (15))

In brief, unlike spoken languages, TSL can resorts to the different syntactic positions to convey different degree of subjectivity. The continuum of modals' subjectivity in TSL is summarized as in Table (4). Table (4) indicates that when the modal is interpreted as in either epistemic sense or deontic sense, the former conveys stronger subjectivity than the later. Further, when the sentences with the same modal only differ in the syntactic positions, the modal in the clause-final position conveys stronger subjectivity than the preverbal one.

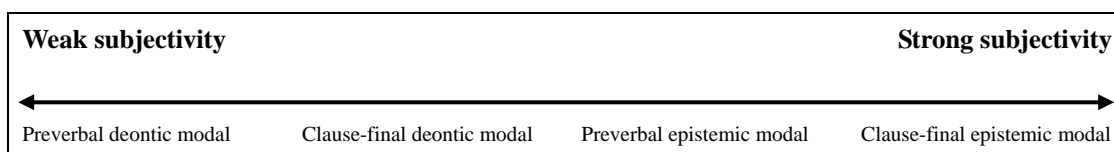


Table (4): The continuum of modals' subjectivity in TSL

4. Double modals in TSL

Some spoken languages allow only one modal in a sentence, such as Standard English, while some spoken languages allow double modals in a sentence, such as Catalan, Iceland, Chinese, and English dialects in the southern United States (DiPaolo 1989; Nagle 2003), as exemplified in (16) and (17). In Standard English, two modals in a sentence will lead to ungrammaticality, even in the reverse order, as given in (16a) and (16b). In Chinese, two modals in a sentence is allowed, while the order of modals have to comply with some semantic constrains, as shown in (17a) and (17b).

(16) Standard English

- a. *Peter [**will**] [**can**] come.
- b. *Peter [**can**] [**will**] come.

(17) Chinese

- a. ta [keneng] [hui] qu Taipei
he may will go Taipei
'It is probable that he will go Taipei.'
- b. *ta [hui] [keneng] qu Taipei

TSL allows double modals in a sentence, and the word order of modals is closely related to the interpretation of modals. (18) and (19) only differ in the order of the modals, but they are interpreted differently. In addition, the reverse order of modals may lead to ungrammaticality of the sentence, as in (20a) and (20b). In the following subsection, how the semantic scopes of modals correlate with the word order of modals will be discussed.

(18) HE GO TAIPEI [SURE] [CAN].

'It is sure that he is allowed to go to Taipei.'

(19) HE GO TAIPEI [CAN] [SURE].

'It is probable that he will go to Taipei.'

(19) a. ELDER-BROTHER GO DRIVE EXERCISE, HE DRIVE [SHOULD]
[ABLE].

'The elder brother ever took driving lessons. It's sure that he is able to drive.'

- b. *ELDER-BROTHER GO DRIVE EXERCISE, HE DRIVE [ABLE]
[SHOULD].

4.1 The word of modals

In RRG, the basic principle of scope assignment governing operators is that the semantic scope of clausal operator is over the core operator, and the scope of core operator is over the nucleus operator. RRG suggests that those operators are syntactically ordered with respect to each other in terms of two rules: (a) Universal operator linear precedence rule, and (b) Language-specific linear precedence rules, as illustrated in (21). As indicated by "Universal operator linear precedence rule", RRG's operators are syntactically ordered and represented with respect to each other in terms of the scope principle. Further, according to "Language-specific linear precedence rules", operators simply line up according to their scope on one side of the nucleus or the other. As to non-verb-final languages, the order of operator is "illocutionary force", "tense", "status", "modality" and "aspect", whereas verb-final languages have these operators in the opposite order.

(21)

a. Universal operator linear precedence rule

CLAUSE \supset CORE \supset NUCLEUS

b. Language-specific linear precedence rules

1. OPs $>$ NUC

2. NUC $>$ OPs

(Van Valin and LaPolla 1997:72)

It has been mentioned that the deontic modals is classified into the operator “modality” (MOD), and the epistemic modals is “status” (STA). Thus, the epistemic modal has to precede the deontic one in non-verb-final language; conversely, the modals are in the opposite order in verb-final languages. Take the non-verb final language, Chinese, as an example. As in (22), the epistemic modal *yiding* ‘must’ precedes the deontic modal *hui* ‘able’. The epistemic modal *yiding* ‘must’ conveys the speaker’s confidence about what he is saying, and the deontic modal *hui* ‘able’ points out the participant’s ability.

Non-verb-final languages:

(21) Chinese

Zhangsan [**yiding**_E] [**hui**_D] da lanqiu

Zhangsan must able play basketball

‘Zhangsan must know how to play basketball.’

We further check some verb-final languages, such as Turkish for head-marking language and Japanese for dependant-marking language, to clarify the sequence of modals. In Turkish, the deontic modal (e.g., *emi*) precedes the epistemic modal (e.g., *yebil*), as given in (23). In Japanese, the deontic modality can be expressed by altering the verb form (e.g., *hanas-er-u* ‘able to speak’ in (24a)), or by individual morpheme (i.e., *dekiru* ‘be able to’ in (24b)), and the epistemic modal (e.g., *hazu*) must follow the deontic modal in Japanese, as shown in (24a) and (24b).

Verb-final languages:

(23) Turkish

Gel-[**emi**_D]-[**yebil**_E]-ir-im

Come-ABLE.NEG-PSBL-AORIST-1sg

‘I may be unable to come.’

(Van Valin and LaPolla 1997:44)

(24) Japanese⁴

a. 彼は中国語が話せるはずだ。

Kare wa chuugokugo ga [hanas-er-u_D] [hazu_E] da.
He TOP Chinese Nom speak can should COP

‘He should be able to speak Chinese.’

b. 彼は中国語が話すことができるはずだ。

Kare wa chuugokugo ga hanasu koto ga [dekiru_D] [hazu_E] da.
He TOP Chinese NOM speak NMZ NOM can should copura

‘He should be able to speak Chinese.’

Figure (6) demonstrates how epistemic and deontic modals are presented in the operator projection and projected onto the syntactic representation in terms of universal operator linear precedence rule.

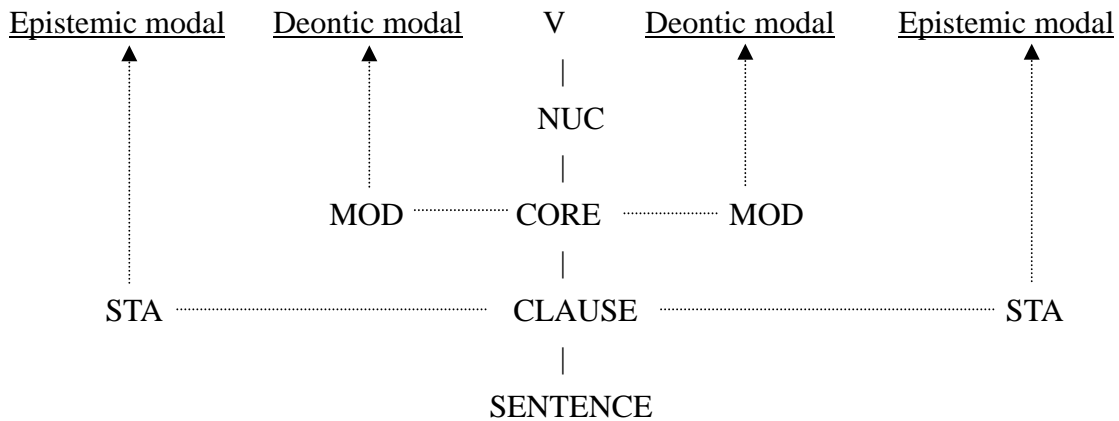


Figure (6): The operator projection and the syntactic representation of modals

It has been suggested that modality in TSL involves both head-initial and head final properties. Thus, the modals in TSL can occur in either the preverbal position or the clause-final position.⁵ The combination of an epistemic modal and a deontic modal can occur in the preverbal position, as in (25a), the postverbal position, as in (25c) and both positions, as in (25e). As far as the word order is concerned, the epistemic modal always precedes the deontic modal in a clause. The ordering of modals in TSL is summarized as in Table (5).

⁴ Thanks Yo Sekiguchi for providing the Japanese data in this paper.

⁵ The instances of clause-initial epistemic modal are not common in our data, so this type of modal will be excluded in the following discussion.

(25)

- a. GRADUATE FINISH, HE GO FIND WORK [**SHOULD_E**] [**ABLE_D**]
‘After graduation, it is probable that he will seek a job.’
- b. *GRADUATE FINISH, HE GO FIND WORK [**ABLE_D**] [**SHOULD_E**]
- c. GRADUATE FINISH, HE [**SHOULD_E**] [**ABLE_D**] GO FIND WORK
- d. *GRADUATE FINISH, HE [**ABLE_D**] [**SHOULD_E**] GO FIND WORK
- e. GRADUATE FINISH, HE [**SHOULD_E**] GO FIND WORK [**ABLE_D**]
- f. *GRADUATE FINISH, HE [**ABLE_D**] GO FIND WORK [**SHOULD_E**]

	The word order of modals			
TSL	(a)	V	[Epistemic modal] [Deontic modal]	
	(b)*	V	[Deontic modal] [Epistemic modal]	
	(c)	[Epistemic modal] [Deontic modal]	V	
	(d)*	[Deontic modal] [Epistemic modal]	V	
	(e)	[Epistemic modal]	V	[Deontic modal]
	(f)*	[Deontic modal]	V	[Epistemic modal]

Table (5): The word order of modals in TSL

As we know, deontic modals modify the relation between participant and action, and epistemic modal is concerned with speaker’s judgment. Thus, deontic modals are classified into the operator “modality” (MOD) and epistemic modals belong to “status” (STA). Syntactically, deontic modals should appear more closely to the verb phrase than epistemic modals. However, it is worthy noting that the combination of modals occurring clause-finally contradicts the generalization given in Figure (6). In fact, epistemic modals occur more closely to the verb than deontic modals in the clause-final position. Also, epistemic modals have to precede the deontic modal, but not vice versa, when two modals occur separately. In brief, in spoken languages, the modals are ordered with respect to each other in terms of their semantic scopes, in which the deontic modals should occur more closely to the verb than the epistemic modals. In TSL, the modal with wider semantic scope (e.g., epistemic modal) always precedes the modal with narrow semantic scope (e.g., deontic modal). The operator projection and the syntactic representation of modals in TSL is demonstrated as in Figure (7).

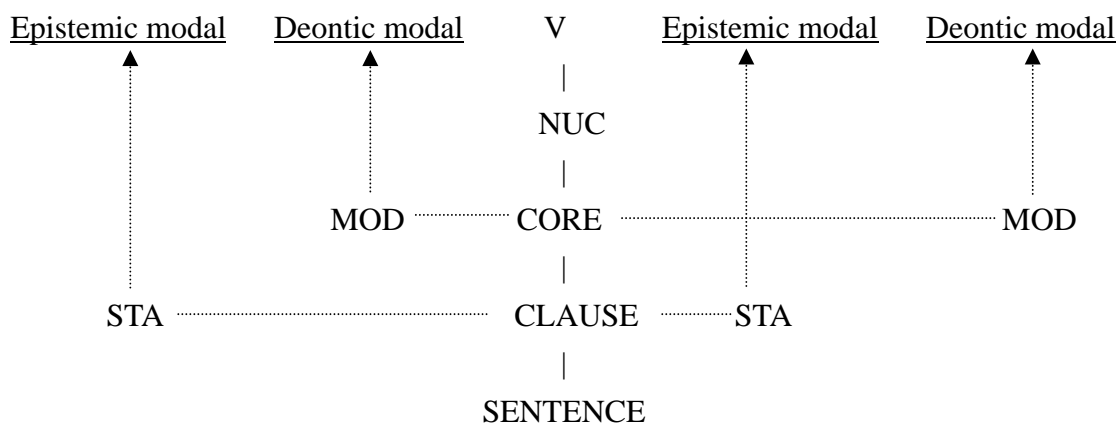


Figure (9): The operator projection and the syntactic representation of modals in TSL

5. Conclusion

This paper has discussed modality in TSL with the framework of Role and Reference Grammar. It is found that modality in TSL involves head-initial and head-final properties at the same time, and the modal with wider semantic scopes (e.g., epistemic modal) has more flexible syntactic distribution than the modal with narrow semantic scope. In addition, TSL signer also resorts to the different syntactic positions of the modal to convey different degree of subjectivity. The modal in the clause-final position is usually incorporated with the non-manual features, such as upward-backward head tilt and chip up, to convey stronger subjectivity. As for the word order of modals, unlike typological generalizations, in TSL the modal with wider semantic scope (e.g., epistemic modal) always precedes the modal with narrow semantic scope (e.g., deontic modal).

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FIXED ADJUNCTS
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Abstract

In Spanish language there is a subcategorized adjuncts group. These syntactic forms are required semantically by the verb and they are not optional modifiers of the core since they strictly modify it, so their elision gives rise to an ungrammatical sentence. These fixed adjuncts display distributional restrictions: they do not have mobility and must always appear adjacent to the verb; they are restricted to modify just to the core's predicate and consequently they can not modify any other layer of the clause. The fixed adjuncts do not have the status of the syntactic core arguments, nor core adjunct-argument, nor oblique core argument, nor core movement verb arguments which are adpositionally marked. But semantically, the fixed adjuncts status is similar to all these syntactic units, since they are subcategorized by the verb. The main idea which I aim to develop in this paper is the following: it is possible that the fixed adjuncts form a part of the core or simply they are an adjunct subclass which obligatorily forms a part of the periphery. The explanation of each one of these positions, so far, will concentrate in the existing correlation between the fixed adjuncts with the operators, the class of verbs and the core arguments.

keywords: adjuncts, fixed, Spanish, core, obligatory, periphery

Adjuncts in Spanish can be classified basically into two groups: in the first one, those adjuncts that modify the predicate's nucleus, sentence's adverbs and adjuncts' adjective modifiers. In the second group, I have placed the fixed adjuncts or subcategorized adjuncts. Semantically, these fixed adjuncts denote different meanings, such as: manner, time, aspect, place, frequency, etc. Throughout this presentation, I will call all lexical units found in group one free adjuncts or peripheral adjuncts and I have decided to label adjuncts of the second group as fixed adjuncts.

In Spanish there are verbs which subcategorize or require fixed adjuncts. These verbs can only express a specific state of affairs if a fixed adjunct appears as a complement. These are intransitive verbs, as in (1). The syntactic form of these adjuncts can be a prepositional phrase, an adjectival phrase, a bare-NP adverbs and an adjunct subordinate clause or may appear as lexical adverbs.

- (1) a. El niño se comporta *mal*
DET boy CL.PRN=behave-3PSG.PR badly
'The boy misbehaves'
a'. *El niño se comporta
DET boy CL.PRN=behave-3PSG.PR
- b. La gente procede *con cautela*
DET people proceed-3PSG.PR with caution
'The people proceed cautiously'
b'. *La gente procede
DET people proceed-3PSG.PR

- c. María se siente *enferma*
 María CL.RF=feel-3PSG.PR sick
 ‘María feels sick’
 c’. *María se siente
 María CL.RF=feel-3PSG.PR
- d. Pedro vivió *una tarde perfecta*
 Pedro live-3PSG.PD DET afternoon perfect
 ‘Pedro lived a perfect afternoon’
 d’. *Pedro vivió
 Pedro live-3PSG.PD
- e. La corte actuó *cuando llegó el acusado*
 DET court act-3PSG.PD when arrive-3P.SG DET defendant
 ‘The court acted when the defendant arrived’
 e’. *La corte actuó
 DET court act-3PSG.PD

On the other hand, if the verb is transitive, a fixed adjunct can also replace the direct object argument, as in (2)

- (2) a. La actriz viste *un traje rojo/ elegantemente*
 DET actress wear-3PSG.PR DET dress red / elegantly
 ‘The actress is wearing a red dress / dresses elegantly’
 a’. *La actriz viste
 DET actress wear-3PSG.PR
- b. Las FARC asesinan *policías / en la noche*
 DET FARC murder-3PPL.PR police / at night
 ‘The FARC murders police / at night’
 b’. *Las FARC asesinan
 DET FARC murder-3PPL.PR
- c. Juan conduce *un BMW / cuando su padre está enfermo*
 Juan drive-3PSG.PR DET BMW/ when PS3PL father be-3PSG.PR sick
 ‘Juan drives a BMW / when his father is sick’

In these clauses, (1) and (2), a nuclear predicate verb only has meaning if it has a complement in the form of fixed adjunct. So far, in clauses (1) and (2), the lexical verb features obligatorily require a fixed adjunct as complement. Nevertheless, there are different constructions which can not express the complete meaning of a state of affairs, as in (3). Once again, these clauses are also grammatical with a fixed adjunct complement.

- (3) a. El puente fue construido *por el gobierno/ ayer*
 DET bridge AUX.be-3PSG.PD build-PP by DET government/ yesterday
 ‘The bridge was built by the government / yesterday’
 a’. *El puente fue construido
 DET bridge AUX.be-3PSG.PD build.PP

- b. El libro de Rulfo se vende *en las tardes / rápidamente*
 DET book of Rulfo CL.MV=sell-3PSG.PR in DET afternoons / quickly
 ‘Rulfo’s book is sold in the evenings / sells quickly’
- b’.*El libro de Rulfo se vende
 DET book of Rulfo CL.VM=sell-3PSG.PR
- c. Se nace *con poco pelo*
 CL.IM=born-3PSG.PR with little hair
 ‘We are born with little hair’
- c’.*Se nace
 CL.IM=born-3PSG.PR
- d. El jugador considera *injusta* la decisión
 DET player consider-3PSG.PR unfair DET decision
 ‘The player considers the decision unjust’
- d’.*El jugador considera la decisión
 DET player consider-3PSG.PR DET decision
 ‘The player considers the decision’
- e. El disco suena *horrible*
 DET album sound-3PSG.PR horrible
 ‘The album sounds horrible’
- e’.*El disco suena
 DET album sound-3PSG.PR

The set of sentences in (3) shows different types of constructions, like a periphrastic passive in (3a), middle voice in (3b), impersonal with unaccusative verb in (3c), secondary predication in (3d) and short adverbs or naked adjectives in (3e). Notice that in each case, the fixed adjunct appears as an essential constituent.

For now, using as reference examples (1) to (3), I can say that the linguistic properties of these adjuncts may be lexical or structural; so I decided to appoint them fixed adjuncts because they have special syntactic and semantic features. Basically, the main idea which I will justify in this presentation is the following: it is possible that the fixed adjuncts may appear in the core. To demonstrate this idea, I am going to divide this work in two parts. In the first one, I will present a general description of these units, and in the second, I will argue the fact that fixed adjuncts may be found in the core.

Next, I present the main features of fixed adjuncts. These units almost always appear in intransitive sentences. Syntactically, the clauses in which they appear have three basic structures: subject, verb and fixed adjunct. The adjuncts may in principle occur in any order, principally in post-verbal adjacent position, but they also can appear before the verb even if the subject moves to a post-verbal position. Intransitive verbs in clauses may be in the initial position but not at the end of the clause, as in (4).

- (4) a. Mariana actuaba *compulsivamente / a mis espaldas*
 Mariana act-3PSG.CO compulsively / to my backs
 ‘Mariana acted compulsively/ behind my back’
- b. *Compulsivamente/ a mis espaldas* actuaba Mariana
- c. Actuaba Mariana *compulsivamente/ a mis espaldas*
- d. ?? Mariana *compulsivamente/ a mis espaldas* actuaba

In sentences with peripheral adjuncts which are not subcategorized by the verb, their movement is flexible and they may occupy different positions, even if the nuclear verb occurs in the final position in the clause, as in (5).

- (5) a. Pedro se afeita *cuidadosamente*
 Pedro CL.RF=shave.3PSG.PR carefully
 ‘Pedro shaves carefully’
 b. *Cuidadosamente* Pedro se afeita
 c. Pedro *cuidadosamente* se afeita

As already mentioned, fixed adjuncts are obligatory constituents, particularly in well formed clauses. Moreover, fixed adjuncts, as in (6), like peripheral adjuncts, as in (7), may appear in cleft sentences. This fact implies that the grammatical units’ information can constitute a focus or emphatic constituent.

- (6) a. La senadora se expresa *libremente*
 DET senator CL.PRN=express-3PSG.PR freely
 ‘The senator expresses herself freely’
 b. *Libremente* es como se expresa la senadora
 freely be-3PSG.PR how CL.PRN=express-3PSG.PR DET senator
 ‘The senator freely expresses herself’
 (7) a. El paciente está sangrando *internamente*
 DET patient be-3PSG.PR bleed-GD internally
 ‘The patient is bleeding internally’
 b. *Internamente* es como el paciente está sangrando
 internally be-3PSG.PR how DET patient be-3PSG.PR bleed.GD
 ‘Internal bleeding is harming the patient.’

The set of sentences in (6) and (7) present different characteristics. For example, in (6b) isn’t exactly the clefted counterpart of the canonical clause in (6a), because in the latter, the verb *expresarse* ‘express oneself’ can only denote a meaning if a fixed adjunct is a clause’s constituent, meanwhile (7a) is clefted in (7b), *sangrar* ‘bleed’ denotes a meaning by itself.

Besides, fixed adjuncts have scope at the nucleus and core level. In order to justify this point, the scope of negation and interrogation is over these fixed adjuncts. The fixed adjuncts only modify the nucleus and core, so in a particular context, when the negation modifies the nucleus, as in (8a), it has scope over the fixed adjuncts; otherwise, the clause could not be grammatical, as in (8b). On the other hand, if a sentence is modified by a free adjunct that takes a core in its scope, as in (8c), negation has scope over the core where the adjunct is one of its constituents; or this adjunct may not be over the negation’s scope, as in (8d), because this peripheral adjunct is a clause modifier. It can be noticed that examples in (8c) and (8d) show a different meaning. In the former, the sentence’s meaning may be restated as the cyclist doesn’t finish the race so well after having some complications; in the second one, fortunately, the cyclist does not finish the race.

- (8) a. El deslizamiento no sucedió *inesperadamente*
 DET slide NEG happen-3PSG.PD unexpectedly
 ‘The slide didn’t happen unexpectedly’
- b. *El deslizamiento no sucedió, *inesperadamente*
- c. El ciclista no terminó la competencia *afortunadamente*
 DET cyclist NEG finish-3PSG.PD DET race luckily
 ‘The cyclist didn’t finish the race as well as he had hoped’
- d. El ciclista no terminó la competencia, *afortunadamente*
 DET cyclist NEG finish-3PSG.PD DET race luckily
 ‘Fortunately, the cyclist didn’t finish the race.’

The scope of negation is evident in these sentences because only an adjunct that takes a nucleus or core in their scope may provide an additional comment about the referential topic, as in (9a); whereas adjuncts as those in (9b) may not.

- (9) a. El deslizamiento no sucedió *inesperadamente*, de hecho, ha
 DET slide NEG happen-3PSG.PD unexpectedly, in fact, AUX.have-3PSG.PR
 sucedido *progresivamente*
 happen.PP progressively
 ‘The slide did not happen suddenly, in fact, it occurred progressively’
- b. El ciclista no terminó la competencia, *afortunadamente*, ??de hecho,
 DET cyclist NEG finish-3PSG.PD DET race, luckily, in fact,
 ha terminado *desgraciadamente*
 AUX.have-3PSG.PR finish.PP unluckily
 ‘The cyclist did not finish the race, well, in fact, he finished very poorly.’

In the same way, interrogation has also scope over fixed adjuncts, as in (10a). This isn’t possible with sentence peripheral adjuncts, as in (10c). In (10b), interrogation covers the fixed adjunct with its scope; this adjunct may be in an initial or final position. While on the contrary, clause peripheral adjuncts aren’t under interrogation’s scope, and may not occupy neither in the initial nor the final position, as in (10d).

- (10) a. ¿El deslizamiento no sucedió *inesperadamente*?
 DET slide NEG happen-3PSG.PD unexpectedly
 ‘¿Didn’t the slide happen unexpectedly?’
- b. (**Inesperadamente*) ¿*Inesperadamente* El deslizamiento no sucedió *inesperadamente*? (**Inesperadamente*)
- c. ¿El ciclista no terminó la competencia? *Afortunadamente*
 DET cyclist NEG finish-3PSG.PD DET race luckily
 ‘¿Didn’t the cyclist finish the race well? Luckily he didn’t’
- d. ¿**Afortunadamente* el ciclista no terminó la competencia, *afortunadamente*?
 luckily DET cyclist NEG finish-3PSG.PD DET race luckily
 ‘¿*Fortunately the cyclist didn’t finish the race, luckily)?’

Besides these two tests, both fixed adjuncts and the core modifiers are subject to the interrogative form introduced by *como* ‘how’ as in (11a), since both adjuncts appear as the answer to the how question. On the other hand in (11b) the sentence adjuncts are not within of the scope of the question.

- (11) a. ¿Cómo sucedió el deslizamiento? –*Inesperadamente*
 how happen-3PSG.PD DET slide unexpectedly
 ‘¿How did the slide happen?’ –‘Unexpectedly’
- b. ¿Cómo terminó el ciclista la competencia? –**Afortunadamente*
 how finish-3PSG.PD DET cyclist DET race luckily
 ‘¿How did the cyclist finish the race?’ –*‘Unfortunately.’

Next, as shown in (12), *desgraciadamente* ‘unfortunately’ and *afortunadamente* ‘fortunately’, as well as nucleus and core adjuncts like *inesperadamente* ‘unexpectedly’ or *puntualmente* ‘punctually’, can occur in a sentence; therefore, the semantic and syntactic status is different because they are constrained by the layers of the operator projection.

- (12) a. *Desgraciadamente*, el deslizamiento sucedió *inesperadamente*
 Unfortunately DET slide happen-3PSG.PD unexpectedly
 ‘Unfortunately, the slide happened unexpectedly’
- b. *Afortunadamente*, el ciclista terminó *puntualmente* la competencia
 luckily DET cyclist finish-3PSG.PD punctual DET race
 ‘Fortunately, the cyclist finished the race in time’

Finally, examples of the different *aktionsart* classes verb forms with fixed adjuncts are shown in (13). State in (13a), accomplishment in (13b), achievement in (13c), active accomplishment in (13d) and activity in (13e).

- (13) a. La propuesta final permanece en la mesa de negociaciones
 DET proposal final remain-3PSG.PR on DET table of negotiation
 ‘The final proposal is still on the negotiation table’
- b. Se desarrolló completamente el proyecto de investigación
 CL.PV=develop-3PSG.PD completely DET project of investigation
 ‘The investigation was fully completed’
- c. Otra amenaza ocurrió a las 10:39
 another threat occur-3PSG.PD at 10:39
 ‘Another threat occurred at 10:39’
- d. Los atletas se dirigen a la meta
 DET athletes CL.PRN=go-3PPL.PR to goal
 ‘The athletes head toward the goal’

- e. *En la película* actuaba Orson Welles
 in DET movie act-3PSG.CO Orson Welles
 ‘Orson Welles acted in the movie’

In a general sense, these verb classes may appear with temporal, manner, place, aspectual and locative fixed adjuncts. In intransitive form, these verbs can’t appear in a sentence without a fixed adjunct. Each predicate can take a fixed adjunct according to their meaning. Here, the main point is that the verb necessarily subcategorizes a fixed adjunct as a complement.

So far, the semantic and syntactic features of fixed adjuncts have been shown. Hereafter, I am going to argue why these adjuncts must not be represented on the clause margin. It isn’t an optional modifier of the core. So, the clause must consist of the core with its arguments and its fixed adjuncts.

The Role and Reference Grammar (RRG) notion of clause structure, called ‘the layered structure of the clause’, is based on two fundamental contrasts: between the predicate and non-predicating elements, on the one hand, and among the non-predicating elements, between arguments and non-arguments, on the other. From this point of view, the primary constituent of the clause is the ‘nucleus’, which contains the predicate, the ‘core’, which contains the nucleus and the arguments of the predicate, and a ‘periphery’, which subsumes non-arguments of the predicate (Van Valin 2005:4). Since the adjunct group is very heterogeneous and this doesn’t have the same syntactic or semantic status, I consider that the core subsumes not only nucleus and arguments but also the fixed adjunct.

Given that their syntactic status is different from direct object, indirect object or prepositional complements, fixed adjuncts do not constitute themselves as arguments of the verb. Nevertheless, these syntactic units are demanded by the lexical features of the nuclear verb, i.e., despite their non-argument status, fixed adjuncts are obligatory units of the core instead of peripheral elements. Furthermore, these have a particular status which is different both the arguments such as the peripheral adjuncts. All fixed adjuncts’ features are coded in a set of grammatical constituents, such as prepositional phrase, bare-NP adverbs, adjunct subordinate clause and lexical adverbs.

The RRG conception of the layer structure of the clause is thus a semantic based theory of non-relational syntactic structure; in other words, the fundamental units in the hierarchical organization of the sentence and the clause are semantically motivated by contrast between predicate and argument on the one hand, and that between XPs, i.e NPs and PPs, which are related to the predicate and those which are not, on the other (Van Valin 2005:8). In this way, the verbs which demand fixed adjuncts select complements which are notionally encoded as peripherals or peripheral adjunct complements. PPs and bare-NP adverbs are treated as units which refer to concepts such as place, temporality, manner, mood, instrument, etc. These constituents are usually seen as external elements to the subcategorization, but this is due to a logical semantic more than to a syntactic use.

Fixed adjuncts do not have the same syntactic status of the core arguments, as in (14a), nor core adjunct-argument, as in (14b), nor oblique core argument, as in (14c), nor core movement verbs argument which are appositionally marked, as in (14d). But semantically, the fixed adjuncts status is similar to all these syntactic units, because they are subcategorized by the verb.

- (14). a. Juan golpeó la ventana
 Juan hit-3PSG.PD DET window
 ‘Juan hit the window’
- b. José puso el libro en la mesa
 José put-3PSG.PD DET book on DET table
 ‘Jose put the book on the table’
- c. Rosa le da el libro a Juan
 Rosa CL.DAT.3PSG=give-3PSG.PR DET book to Juan
 ‘Rose is giving the book to Juan.’
- d. Juan fue a la casa de Luisa
 ...Juan go-3PSG.PD to DET house of Luisa
 ‘Juan went to Luisa’s house’

The direct object argument may be replaced by a fixed adjunct in a simple sentence, as in (14a), as well as in *Juan golpeó certeramente* ‘Juan hit accurately’, which means that arguments and fixed adjunct are semantically similar because the predicate demands a unit as a complement. The same fact occurs with predicative adpositions, for the reason that they function like predicates since they add substantial semantic information to the clause in which they occur; this, in terms of their own meaning and of the meaning of the argument that they govern. An example of a predicative adposition is a peripheral core locative (setting) preposition (Van Valin 2005: 21), as in (15).

- (15) a. Juan limpió el carro después del trabajo
 Juan clean-3PSG.PD DET car after DET work
 ‘John cleaned the car after work.’
- b. **be-after**’ (work,[[**do**’ (Juan, Ø)] CAUSE [BECOME **cleaned**’ (car)]])

On the other hand, fixed adjuncts also contribute with essential semantic information to the clause. They denote different meanings and their basic role is setting the verb’s sense on a specific communicative context, as in (16). In the logical structure the argument and predicate are modified according to a temporal or spatial referential point. This is, in the formal representation the logical structure of the event is treated as an entity being located with respect to a spatial or temporal reference point, on the one hand, or an entity modified by a manner adjunct, on the other.

- (16) a. Los alumnos conviven armoniosamente / diariamente / en la ciudad
 DET students coexist-3PPL.PR harmoniously daily in DET city
 ‘The students hang out together harmoniously / daily/ in the city’
- b. **be-in** (city [**harmoniously**’/**daily**’ (do’ (students, [**coexist**’ (students)])))]

The predicative prepositional phrase in (16), *en la ciudad* ‘in the city’, may co-occur with a manner or temporal adjunct in the same clause. This peripheral phrase typically takes the logical structure of the core as its argument. It takes the core in its scope, however, this grammatical unit may appear as a fixed adjunct, as in *los alumnos conviven en la ciudad*, ‘the students hang out together in the city’, given their meaning, its semantic status causes this constituent to be obligatory rather than optional. About this point, Van Valin (1997, 2005) and Ibáñez (2009) argue that this kind of

prepositional phrase has argument status if they occur typically with motion, creation or consumption verbs. From the perspective of this paper it is not possible yet to argue about their argument syntactic status. Up to this point, it is just feasible to say that these grammatical units occur as fixed adjuncts.

There is one more type of predicative PP which is also semantically related to fixed adjuncts. This is the argument-adjunct PP of the core, as in (17a). The PP can mark an argument of the verb and add its semantic properties to the clause. A verb like *poner* ‘put’ requires a locative expression, but the choice of locative preposition is not determined by the verb (Van Valin 2005: 23) as in *Yolanda puso el libro en/ sobre/ junto/ detrás/ encima/ bajo de la caja* ‘Yolanda puts the book in / on / next to / behind / on top of / under the box’. This grammatical behavior is similar with fixed adjuncts, as in (17a). The nuclear verb requires a temporal expression and the choice of the temporal preposition is not determined by the verb, as in *el accidente se produjo en / durante / hacia / hasta / por el mes de marzo* ‘the accident happened in / during / *towards / *until / * by the month of March’, in an opposite way to (17a), in (17b) the PP doesn’t mark the verb argument; it is basically a grammatical constituent which contribute its semantic meaning to the clause.

- (17) a. Yolanda puso el libro en la caja
 Yolanda put-3PSG.PD DET book in DET box
 ‘Yolanda puts the book in the box’
 a’. ([do’ (Yolanda, Ø) CAUSE [BECOME **be-in**’ (box, book)])
- b. El accidente se produjo en el mes de marzo
 DET accident CL.VP=occur-3PSG.PD in DET month of march
 ‘The accident occurred in the month of March.’
 b’. BECOME (**be-in**’ (March (**occured**’ (accident)))

In English, a verb like *put* does not always take three arguments; if it combines with an intransitive preposition as *down*, the result is a two-argument core, e.g. *Yolanda put the book down* ([do’ (Yolanda, Ø)] CAUSE [BECOME **be-down**’ (book)]). The preposition lacks an object but is linked to the third argument position in the core. These intransitive prepositions can fill core slots (Van Valin & LaPolla 1997: 160 and Van Valin 2005: 142). The argument reduction in verbs like *put* is similar in Spanish, but for instance of intransitive preposition, a fixed adjunct fills the core slots, as in *Yolanda puso el libro allá* ([do’ (Yolanda, Ø)] CAUSE [BECOME **be-loc**’ (book)]).

So far, semantic similarities existing between fixed adjuncts and core arguments have been presented. Fixed adjuncts are essential constituents in the semantic configuration of the clause where they occur, in spite of, noticeably, having not the same syntactic status as core arguments. Farther, in the same way that core arguments correlate with the semantic structure of the core, fixed adjuncts do.

Now I am going to present a short contrast between free and fixed adjuncts. As it has already been said in other studies (Van Valin & LaPolla 1997:162), adverbs, in this presentation, free adjuncts, are not restricted to the periphery and may modify any layer of the clause. Semantically, Van Valin & LaPolla treat them as one-place predicates which take a logical structure or subpart of a logical structure as their argument. The peripheral bare NP adverbs like *mañana* ‘tomorrow’ or *ayer* ‘yesterday’, as in (18), take the logical structure of the core as their argument.

- (18) a. Rosa baked a cake yesterday.
 b. **yesterday'** ([**do'** (Rosa, Ø)] CAUSE [BECOME **baked'** (cake)])

When a predicative prepositional phrase functions as an adjunct modifier, they take the logical structure of the main verb as one of their argument, as in (19) (Van Valin 2005: 49).

- (19) a. Rosa corre en el parque
 Rosa run-3PSG.PR on DET park
 'Rosa runs in the park'
 b. **be-in' (park', [do' (Rosa, [run' (Rosa)])])**

In (19), Rosa's running takes place in the park, and the logical structure of the predicative preposition *in* is the highest predicative element in the logical structure. It takes *en el parque* 'in the park' and the logical structure of *correr* 'run' as its two arguments. This contrasts with the logical structure of an active accomplishment, as in (20), where the PP expresses the location of the reference of *Rosa*, not the location of the event of *running*, so this PP functions as an argument-adjunct.

- (20) a. Ana ran to the park
 b. (**do'** (ana, [**run'** (Ana)]) & INGR **be-at'** (park, Ana))

Manner adjuncts modify primary activity predicates, while place adjuncts can modify any kind of durational predicates, as in (21a). Aspectual adjuncts modify the basic state or activity predicates, as in (21b) (Van Valin 2005: 49).

- (21) a. Pedro elegantly closed the door slowly
 a'. [**elegant'** (**do'**(Pedro, Ø))] CAUSE [**slow'** (BECOME **closed'** (door))]
 b. The ice melted completely
 b'. BECOME (**complete'** (**melted'** (ice)))

Van Valin's description of adverbs and adpositions is relevant because the form of the fixed adjunct may be a PP, a bare-NP adverb or a lexical adverb. Fixed adjuncts always occur in clauses with one argument; the argument and the nuclear verb of the core do not express the full meaning of the state of affairs by themselves. As shown before, they may combine with quite diverse *aktionsart* verb classes, as in (22). Hence, the meaning of the fixed adjunct modifying the verb is semantically correlated with core units.

- (22) a. El paro duró una semana
 DET strike last-3PSG.PD one week
 'The strike lasted one week'
 a'. BECOME (**lasted'** (**one week'** (the strike))))
 b. El niño se comporta mal
 DET child CL.PRN=behave-3PSG.PR bad
 'The child misbehaves'
 b'. (**do'** (children, [(**behave'** (**badly'** (children)))))) V y L (105)

c. El feto se desarrolló *completamente*
 DET fetus CL.RF=develop-3PSG.PD completely
 ‘The fetus developed completely’
 c’ BECOME (**develoed**’ (**complete**’ (fetus)))

d. Ese secuestro sucedió *hoy*
 DET kidnapping occur-3PSG.PD today
 ‘That kidnapping happened today’
 d’ INGR (**occur**’ (**today**’ (kidnapping)))

Temporal fixed adjuncts, as in (22a) and (22d), manner, as in (22b), aspectual, as in (22c), primary modify the predicate. They take a specific position in the logical structure. Adverbs or free adjuncts are represented in logical structure as one-place predicates, these modify different parts of a logical structure. Fixed adjuncts in the logical structure occur over the *aktionsart* scope operator, because they modify any layer of the clause, nucleus or core, and they are a basic constituent of the verb. On the other hand, two peripheral adjuncts may co-occur in a clause, as in (23); any of them, by exclusion, has the possibility to become a fixed adjunct, as in *hoy sucedió un secuestro* ‘the kidnapping occurred today’ or *inexplicablemente sucedió un secuestro* ‘A kidnapping occurred inexplicably’.

(23) a. Hoy inexplicablemente sucedió un secuestro
 Today inexplicably occur-3PSG.PD DET kidnapping
 ‘Today, inexplicably a kidnapping occurred’
 b. **today**’ (INGR (**occured**’ (**inexplicable**’ (kidnapping))))

If there are multiple adjuncts, fixed or free (peripheral), they are necessarily layered, and the last one must be represented as the highest predicate, as in (23). In the logical structure they appear as one-place predicate, for example, *today* takes the logical structure of the core as its argument and *inexplicably* modifies any achievement or accomplishment logical structure. The last adjunct in the clause is over INGR scope and it modifies the nuclear verb. This fixed manner adjunct must be represented as a constituent of the core in the constituent projection and as a modifier of the core in the operator projection. This point will be developed in detail in a forthcoming paper.

Finally, peripheral adjuncts are not restricted to the periphery and may modify any layer of the clause; but fixed adjuncts must be represented as constituents of the core. Van Valin & LaPolla (1997) describe the peripheral adjuncts as one-place predicates which take a logical structure or a subpart of a logical structure as their argument. I decided to conceive fixed adjuncts as grammatical units which modify the logical structure. Their scope depends on their semantic features, so NP bare adverbs take the logical structure, temporal adjuncts take scope over the core, manner adjuncts modify activity logical structure, place adjuncts modify any durative or dynamic logical structure, and aspectual adjuncts modify the basic state or activity predicates themselves (Van Valin & LaPolla 1997). Besides, fixed adjuncts complete the nuclear verb meaning.

Here, I still have not presented the way how fixed adjuncts are related with the operators projection. Given their meaning, they should be represented not only in the logical structure but also in the operator projection. This is to say, they will be represented in both constituent and operator projections. In the former, they must be

treated as constituents of the core, so they occupy a special syntactic position; their scope of modification must be represented in the latter.

ABBREVIATIONS

AUX auxiliar, CL clitic, CO copreterit, COP copula, DAT dative, DET determinant, GD gerund, IM impersonal, MV middle voice, NEG negation, P person, PD past, PL plural, PP participle, PR present, PS possessive, PRN pronominal, PT participle, PV passive voice, RF reflexive, SG singular

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Functional/Absolute Case Syncretism: An RRG-OT Account and Its Extension to Contextual Syncretism

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Abstract

The pervasive presence of syncretism renders a typological investigation of case-marking systems a challenging task. The present study aims to provide an initial step toward an RRG-OT account of syncretism, with a focus on absolute/functional syncretism among core case morphemes. An attempt is made to derive the typological variation of the absolute case syncretism from the interaction between markedness and faithfulness constraints and to prove the validity and viability of the proposed account by demonstrating that it is extendible to contextual syncretism in gender, number, and case in part of the German declension system.

Keywords

Case, syncretism, markedness, Optimality Theory

1 Introduction

Case marking displays a wide range of typological variation and has been a target of intense study within and outside of **Role and Reference Grammar [RRG]** (Van Valin 1993, Van Valin and LaPolla 1997). What adds to the complexity of the case-marking system is that it is often subject to **absolute (functional) syncretism** and/or **contextual syncretism** (Calabrese 2008; cf. Meiser 1992).

Absolute case syncretism [ACS] involves a multiple correspondence between a case morpheme and more than one case function (however it may be defined) that holds across the morphology of language, while **contextual case syncretism [CCS]** involves replacing a case morpheme with another one only in certain nominal classes. A typical example of the CCS is a person-based split-ergative marking as in Dyrbal (Pama-Nyungan: Dixon 1972). Despite its pervasive presence, little systematic work has been done on syncretism within the framework of RRG (see Baerman et al. 2005 for an overview of syncretism). The purpose of this paper is to propose an RRG-OT account of the ACS among core case morphemes, i.e. nominative, accusative, ergative, dative, and genitive.

As an illustration of the ACS, consider examples (1a)-(1f), taken from Kabardian (Northwest Caucasian) (Colarusso 1992: 167, Smith 1996: 108, 111, 113):

- (1) a. λ'ə-m šə-r fəzə-m jərəjtáħš.
 man-OBL horse-NOM woman-DAT (NOM:3)-IO-ACT-gave
 "The man gave the horse to the woman".
- b. λ'ə-m šə-r jə-wəh'áhš.
 man-OBL horse-NOM (NOM:3)-ACT-killed
 "The man killed the horse".
- c. ɣa-r žaşə-m mabáhna.
 dog-NOM night-OBL (NOM:3)-bark
 "The dog barks at night".
- d. λ'ə-m fəzə-m náxra nax'ə'əzš.
 man-NOM woman-OBL older (NOM:3)-is
 "The man is older than the woman".

- e. mázə-m jahh.
 forest-OBL ACT-(NOM.3rd)carry
 “They carry it to the forest”.
- f. ɣa-m ø-yə-pa-r
 dog-OBL 3-POSS-nose-NOM
 “the dog’s nose”

Kabardian is a head-marking language with a two-way case-marking system. Unlike the nominative morpheme *-r*, which may appear once per clause, the oblique morpheme *-m* may appear multiple times. What is striking about Kabardian is that the oblique case morpheme marks transitive subjects, all oblique NPs, and even adnominal possessors. (2) diagrams the multiple correspondence between case functions and case morphemes in Kabardian:

(2) Absolute Case System in Kabardian

Case Function	Case Morpheme
NOM	<i>-r</i>
DAT	<i>-m</i>
ERG	
GEN	

An analogous, “across-the-board” neutralization among oblique case functions (e.g. location, goal, instrumental, comitative) is observed in Halkomelem Salish, in which all oblique lexical NPs (arguments or adjuncts) are represented by the same case morpheme (Gerdtz 1988).

It is clear that it is impossible to identify what is shared by these three case functions semantically and that the multiple correspondence in Kabardian is not amenable to the feature decomposition-based approach to case syncretism (e.g. Jakobson 1936/1983, Bierwisch 1967, Neidle 1988, Calabrese 2008). I will provide an OT account of these and other examples of ACS and will show that the OT account is extendible to the determiner and strong adjective declensions in German, i.e. an oft-discussed example of contextual syncretism.

Before going into the main part of the present paper, it is necessary to make a few assumptions. First, I assume a set of constraints in (3a)-(3e) (Nakamura 1997, 1999, 2007):

(3) Universal Constraint Set

- a. **At least one argument** takes NOMINATIVE case.
- b. **Non-macroroles arguments/adjuncts** take DATIVE case.
- c. **Undergoers** take ACCUSATIVE case.
- d. **Actors arguments** take ERGATIVE case.
- e. **At least one nominal argument** takes GENITIVE case.¹

(3a) accommodates the traditional observation (Jakobson 1936/1983) that nominative is the default case morpheme. (3c,d) are derived from the observation that accusative and ergative case morphemes normally mark undergoers and actors, respectively. (3b) follows Van Valin (1993) in defining dative as the default case morpheme for oblique (i.e. non-macroroles) NPs. Furthermore, (3e) defines genitive as the default case morpheme for nominal arguments (Nakamura 2007). I have shown elsewhere (Nakamura 1997, 1999) that re-ranking (3a)-(3d) yields the typological variation of case systems in (4). For reasons of space, I will not repeat the argument here except to provide an illustration of how (4a) outputs a case frame when it takes a pair of actor and undergoer as input:

¹ Many languages allow a genitive case morpheme to appear within an NP only once, but Japanese and Finnish (Hakulinen and Karlsson 1979: 395) permit the genitive morphemes to appear more than once within an NP.

(4) **Typological Variation of Major Case Systems** (Nakamura 1997, 1999)

- a. Accusative Case System: (3b) >> (3a) >> (3c) >> (3d)
- b. Ergative Case System: (3b) >> (3a) >> (3d) >> (3c)
- c. Accusative-Active Case System: (3b) >> (3c) >> (3a) >> (3d)
- d. Ergative-Active Case System: (3b) >> (3d) >> (3a) >> (3c)

Table 1: Accusative Case Systems: Transitive Clauses

Input: Actor-Undergoer	(3b)	(3a)	(3c)	(3d)
Nom.-Nom.			*!	*
☞ Nom.-Acc.				*
Erg.-Nom.			*!	
Erg.-Acc.		*!		

Second, I adopt the **case hierarchy** [CH] in (5), a markedness hierarchy of case morphemes proposed (in conjunction with the **NP lexical content hierarchy**) by Silverstein (1976, 1980/1993):

(5) **Case Hierarchy** [CH] (adapted from Silverstein 1980/1993: 485)

- a. Nom ⇔ Dat₁ < $\overbrace{\{\text{Acc, Erg}\}}^{\text{Gen}}$ < Adnominal
- b. Dat₂ < $\overbrace{\{\text{Loc, ...}\}}^{\text{Propositional}}$ < Adverbial/Propositional

(5a) represents implicational relations among adnominal/propositional case morphemes, while (5b) represents those among adverbial/propositional case morphemes.² I assume, contrary to Silverstein (1976, 1980/1993), that there is no markedness relation between the accusative and ergative case morpheme and treat them on an equal footing throughout the present paper.

A word is in order about the markedness relation between the accusative/ergative and genitive. The first point to note is that they belong to different domains: the former belong to the propositional domain, while the latter belongs to the nominal one. We may, nonetheless, assume that the genitive (defined as “adnominal dative” by Silverstein) is more marked than the accusative/ergative, under the assumption that the nominal domain is more marked than the propositional one. This means that the CH in (5a) is better represented as in (6):

(6) **Case Hierarchy** (Adnominal/Propositional: Revised)

Domain	Unmarked	⇔	Marked 1	<	Marked 2	<	Marked 3
Adnominal	Nom	⇔	Dat	<	Gen [+N]	<	Part(itive)
Propositional					Acc, Erg [--N]		...

(6) shows how the propositional/adnominal case-marking systems emerge as an elaboration on or reduction into the fundamental contrast between the nominative and dative. In contrast to the genitive (nominal) and accusative/ergative (propositional), the nominative and dative case morphemes are underspecified with respect to the domain they belong to.³

² I leave it to another occasion to investigate the syncretism among adverbial case morphemes except to note that (5b) accommodates the syncretism between dative and other oblique case morphemes. See Blansitt (1988) for an attempt to establish implicational relations among the dative, allative, and locative (cf. Croft 1991).

³ As will be illustrated in Section 3, the dative case morpheme may appear either in the nominal or propositional domain. For example, Bengali (Indo-Aryan) marks adnominal possessors with the dative case (Klaiman 1980,

It is important to note that the accusative/ergative and genitive case morpheme occupy the same structural position relative to the dative in (6). Their structural parallelism demands that they receive a morphologically equal treatment even if they belong to the different domains. In what follows, I will focus on the ACS among the core case morphemes in (5a).

The rest of the paper is organized as follows. Section 2 introduces a set of markedness and faithfulness constraints that allows us to describe the ACS. Section 3 illustrates the typological variation of ACS. Section 4 shows how the proposed constraints accommodate the typological variation of the ACS. Section 5 extends this account to the adjective and determiner declensions in German. Section 6 is a conclusion.

2 Constraints for Describing ACS

In this section, I will turn the CH into a set of markedness and faithfulness constraints that allows us to describe and predict the typological variety of ACS.

First, I follow de Lacy (2006) in formalizing scale-based markedness relations in terms of a **stringency hierarchy** in (7a) rather than their universally fixed ranking (Prince and Smolensky 2004) in (7b). Under de Lacy's (2006) proposal, a fixed ranking of markedness constraints is replaced by a subset structure within the constraint family, as shown in (7a):

- (7) a. **Stringency Hierarchy Theory** (de Lacy 2006)
 $*\{X\}, *\{X, Y\}, *\{X, Y, Z\}$
 b. **Fixed Ranking Theory** (Prince and Smolensky 2004)
 $*X \gg *Y \gg *Z$

Each of the constraints in (7a) includes the most marked member ('X'). It becomes progressively stringent and bans a larger, adjacent portion of the markedness hierarchy. These stringency-based constraints are freely rankable (like the other constraints in OT); no matter how they are ranked, the more marked member involves more violations than the less marked one and therefore loses to the less marked one (unless other constraints intervene).

The notion of stringency hierarchy allows us to derive from the CH three **markedness constraints** in (8) under the assumption that nominative is underspecified with respect to its morphological value as well as its argument role (cf. Jakobson 1936/1983):

- (8) **Markedness Constraints** (derived from the CH)
 a. $*\{\text{Gen}\}$
 b. $*\{\text{Gen, Acc/Erg}\} \begin{matrix} \swarrow 1. \\ \searrow 2. \end{matrix} \begin{matrix} *\{\text{Gen, Acc}\} \\ *\{\text{Gen, Erg}\} \end{matrix}$
 c. $*\{\text{Gen, Acc/Erg, Dat}\}$

I will refer to ' $*\{\text{Gen, Acc/Erg}\}$ ' as a shorthand for ' $*\{\text{Gen, Acc}\}$ ' and ' $*\{\text{Gen, Erg}\}$ '.

Second, I propose two types of **faithfulness constraints** in (9), which compete against the markedness constraints in (8): (9a) requires that each case function is realized by some case morpheme, while (9b) requires that case values are the same in the input and output: ⁴

- (9) **Faithfulness Constraints**
 a. MAX [Case (=Gen, Acc/Erg, Dat)]
 b. IDENT [Case (=Gen, Acc/Erg, Dat)]

1981), while Djaru (Pama-Nyungan) marks adnominal alienable and a few inalienable possessors with the dative and leaves most of adnominal inalienable possessors nominative-marked (Tsunoda 1981: 194-197).

⁴ It may be tempting to follow the spirit of de Lacy (2006) in proposing 'IDENT [Gen]' and 'IDENT [Gen, Acc/Erg]' in addition to (9b), but I don't introduce the above-mentioned two IDENT constraints here, since they don't accommodate the parallelism between the accusative/ergative and genitive case morpheme.

The main difference between MAX and IDENT constraints is that the former allow no feature deletion but feature changing, while the latter allow no feature changing but feature deletion.

It is important to note at this juncture that the genitive, accusative, and ergative case morpheme are more marked than the dative case morpheme by one degree (as shown in (6)) and that the genitive is opposed to the accusative and ergative, in that the former occurs in the nominal domain, while the latter occur in the propositional domain. Given these observations, I propose to supplement (9b) with (10a,b):

- (10) a. IDENT [Gen/Acc, Dat] & IDENT [Gen/Erg, Dat]
 Shorthand: IDENT [Gen/Acc/Erg, Dat]
 b. IDENT [\pm Nominal] ([+N]=Gen, [--N]=Acc, Erg)

(10a,b) are based on the assumption that the genitive, accusative, and ergative case morpheme form a natural category (as opposed to the dative) in terms of degree of markedness (cf. Béjar and Hall 1999) and represent a two-stage decomposition of markedness relations among the genitive, accusative, ergative, and dative case morpheme.

Specifically, (10a) is a locally conjoined constraint (Smolensky 1995) that is violated only when both of the subconstraints are violated and requires that the degree of markedness is the same in the input and output.⁵ (10a) treats the accusative and ergative separately, since a distinct genitive case morpheme implies a distinct accusative or ergative case morpheme.⁶ In contrast to (10a), which treats the genitive on a par with the accusative and ergative, (10b) distinguishes between the genitive and accusative/ergative on the basis of the binary feature [\pm N] and dictates that the value of the [N] feature is the same in the input and output.

I will use (8)-(10) to describe the syncretic patterns illustrated in the next section and will use ‘*{Gen, Acc/Erg}’ and ‘IDENT [Gen/Acc/Erg, Dat]’, respectively, as a shorthand for (8b1, 8b2) (when they constitute a block in the constraint ranking) and (10a).

3 Examples of Absolute Case Syncretism

I will illustrate the typological variety of the ACS in (11). (11a)-(11f) exhaust all the logically possible patterns of syncretism among the core case morphemes (given the CH):

- (11) **Typological Variation of Absolute Case Syncretism**⁷
- | | | |
|----|--------------------------|---------------------------|
| a. | DAT=ERG(/ACC)=GEN, NOM | (e.g. Kabardian, Yagnob) |
| b. | DAT=GEN, NOM, ACC or ERG | (e.g. Bengali, Djaru) |
| c. | ACC=GEN, NOM, DAT | (e.g. Estonian, Finnish) |
| d. | ERG=GEN, NOM, DAT | (e.g. Inuktitut, Tagalog) |
| e. | DAT=ACC, NOM, ERG, GEN | (e.g. Hindi) |
| f. | DAT=ERG, NOM, ACC, GEN | (e.g. Nyungar) |

We already saw in Section 1 that Kabardian and Yagnob instantiate the ACS in (11a).

⁵ (10a) allows the genitive case function to be mapped to the accusative, ergative, or genitive case morpheme and leaves it up to the other constraints which case morpheme is chosen to represent the genitive case function.

⁶ For example, Hindi (Indo-Aryan) has a distinct ergative case clitic *-ne*, but lacks a distinct accusative case clitic because of the dative-accusative syncretism, while Nyungar (Pama-Nyungan) has a distinct accusative case suffix, but lacks a distinct ergative case suffix because of the dative-ergative syncretism.

⁷ The dative-ergative syncretism in Nyungar (Pama-Nyungan) involves the following three complications. First, some adnominal possessors (including pronominal possessors) are dative-marked, while others are genitive-marked (Symmons 1842, Dixon 2002). Second, Nyungar maintains a morphological distinction between the ergative and dative in first-person singular pronouns (Dixon 2002: 313). The third complication is that there are two opposing views on whether or not there is a dative-ergative syncretism in Nyungar. Symmons (1842) and Blake (1977) claim that there is, while Dixon (2002) claims that the Nyungar ergative suffix (which he analyzes as *-al*) is distinct from the dative suffix *-ak*. I tentatively follow Symmons (1842) and Blake (1977) in this paper.

Examples (12a)-(12c) come from Bengali (Indo-Aryan) (Klaiman 1981: 3, 4, 20):

- (12) a. aami-Ø caakor-Ø/tomaake khũjchi.
I-NOM servant-NOM/you.ACC am.seeking
“I am looking for a servant”.
- b. raastaay ekti meye-Ø/meye-ke dekhlaam.
road.LOC a girl-NOM/girl-ACC saw.1stPers
“I saw a girl on the street”.
- c. aamaar tomaake mon-e porbe.
me.DAT you.ACC mind-LOC will.fall
“I shall remember you”.
- d. haṭhaat aamaar maathaay buddhi-Ø elo.
suddenly me.GEN head.LOC idea-NOM came
“I suddenly got an idea”.

(12a,b) show that Bengali has a split-accusative system in which humanness and definiteness play an important role. (12c,d) show that the dative and genitive are realized by the same case morpheme in Bengali. The Bengali syncretism illustrated in (12) is similar to the Kabardian syncretism illustrated in (1), in that both of them exhibit a syncretism involving the dative case morpheme: Bengali exhibits the dative-genitive syncretism, while Kabardian exhibits the dative-ergative-genitive syncretism.

Furthermore, consider (13a,b) from Inuktitut (Eskimo-Aleut: Johns 1987: 12, 15):

- (13) a. Jaani-up natsiq kapi-ja-a.
John-REL seal stab-DEC.TR-3SG.3SG
“John is stabbing/stabbed the seal”.
- b. Jaani-up aggaa-nga
John-REL glove-POSS.3SG
“John’s glove”

These examples show that ergative and genitive are realized by the same case morpheme (termed the “relative case” in the Eskimo linguistics literature) in Inuktitut. An analogous ergative-genitive syncretism is observed in Tagalog (Austronesian: Kroeger 1993).

Examples (14)-(16) come from Estonian (Finno-Ugric), which involves a syncretism between accusative and genitive; the accusative/genitive case morpheme encodes a nominal or aspectual boundedness (as illustrated by the alternations in (14a,b)-(16a,b)) in addition to encoding adnominal possessors as in (14c) (Matsumura 2001):

- (14) a. Üliõpilased ehita-vad ise ühiselamu.
students build-3PL themselves hall.of.residence.GEN
“Students build a hall of residence for themselves”. (complete action)
- b. Üliõpilased ehita-vad ühiselamu-t.
students build-3PL hall.of.residence-PART
“Students are building a hall of residence”. (incomplete action)
- c. noore tüdruk-u kleit
young girl-GEN dress
“young girl’s dress”
- (15) a. Arvo ost-is-Ø jalgratta.
Arvo buy-PAST-3SG bicycle.GEN
“Arvo bought a bicycle”.

- b. Arvo ei ost-nud jalgratas-t.
Arvo NEG buy-PAST.PART bicycle-PART
“Arvo didn’t buy a bicycle (Lit. Arvo hasn’t bought a bicycle)”.
- (16) a. Ma telli-n tee ja koogi.
I order-1SG tea.GEN and cake.GEN
“I order tea and cake (for one person)”.
- b. Ma telli-n tee-d ja kook-i.
I order-1SG tea-PART and cake-PART
“I order (an unspecified amount of) tea and cake”.

This accusative-genitive syncretism holds across the morphology of Estonian; it is observed in both lexical nouns and pronouns.

Examples (17a,b) come from Finnish (Finno-Ugric: Vainikka 1993: 130, 142, 143):

- (17) a. Riita-n auto on ulkona.
Riita-GEN car.NOM is outside
“Riita’s car is outside”.
- b. Riita luki kirja-n
Riita.NOM read.PAST.3SG book-GEN
“Riita read the book”.
- c. Riita luki kirja-a
Riita.NOM read.PAST.3SG book-PART
“Riita was reading a/the book”.
- d. Riita ei luki kirja-a/*kirja-n
Riita.NOM NEG read.PAST.3SG book-PART/*book-GEN
“Riita didn’t read the book”.

Like Estonian, Finnish displays an alternation between accusative-genitive and partitive that is sensitive to the nominal/aspectual boundedness. What distinguishes the Finnish syncretism from the Estonian counterpart is that the accusative-genitive syncretism holds in lexical nouns alone in Finnish (Karlsson 2008).

Finally, Hindi exhibits a dative-accusative syncretism while having a distinct ergative and genitive case morpheme (Mohan 1994: 59, 60, 80): ⁸

- (18) a. bacce-ne kitaab paḍʰii.
child-ERG book.NOM read.PERF
“The child read a book”.
- b. raam-ne bacce-kaa naam pukaaraa.
Ram-ERG child-GEN name.NOM call.PERF
“Ram called the child’s name”.
- c. ilaa-ne haar-ko utʰaayaa.
Ila-ERG necklace-ACC lift.PERF
“Ila lifted the/*a necklace”. ⁹
- d. ilaa-ne bacce-ko/*baccaa utʰaayaa.
Ila-ERG child-ACC/child.NOM lift.PERF
“Ila lifted a/the child”.
- e. niinaa-ne bacce-ko kitaab dii.
Nina-ERG child-DAT book.NOM give.PERF
“Nina gave the child a book”.

⁸ Hindi has an aspect-based split-ergative system in which the ergative clitic *-ne* marks transitive actors in perfective clauses. Other Indo-Aryan languages (e.g. Marathi, Punjabi, Kashmiri) exhibit an analogous dative-accusative syncretism (Bhatia 1993, Wali, Koul, and Kaula 1997, Dhongde and Wali 2009).

⁹ Hindi allows bare nouns to be interpreted as generic, definite, or indefinite (Mohan 1994: 79).

Hindi assigns the dative clitic *-ko* to recipients in ditransitive constructions and animate and/or specific undergoers in transitive constructions (see Mohanan 1994: 79-90 for more examples and discussion of the interaction between animacy and specificity/definiteness).¹⁰ These Hindi data illustrate that when both the accusative and ergative case function are case-marked in a language with a distinct genitive case morpheme, either of them may be realized by the less marked case morpheme (dative).

Finally, Nyungar (Pama-Nyungan) uses the same case suffix *-ak* to represent the ERG, DAT, and LOC and mark some adnominal possessors (including pronominal possessors) (Symmons 1842, Blake 1977: 65). Nyungar has a distinct accusative and genitive case suffix, the latter of which marks those adnominal possessors that are not marked by the suffix *-ak*.

4 Analysis of Absolute Case Syncretism

This section shows that the Kabardian/Yagnob, Bengali, Inuktitut, Estonian/Finnish, Hindi, and Nyungar case syncretism are derived from a competitive interaction between the set of markedness and faithfulness constraints in (8)-(10).

4.1 Kabardian and Yagnob

Let us begin with the Kabardian case system. Since Kabardian uses the same case suffix to mark transitive undergoers and intransitive subjects to the exclusion of transitive actors, we may safely assume that Kabardian has an ergative case system.

The problem, then, is that the constraint hierarchy (4b) alone cannot assign the same case morpheme to transitive actors, non-macroroles, and adnominal possessors. We need to bridge the gap between the constraint hierarchy (4b) (which yields a full-fledged ergative case system) and the impoverished two-way case-marking system illustrated in (1).

I propose that the constraint hierarchy (19) is responsible for such a drastic reduction and maps the set of case functions output by the constraint hierarchy (4b) to the dative and nominative case morpheme. Ranking ‘MAX [Case]’ above ‘IDENT [Case]’ leaves some room for non-nominative case values to change. Tables 2(a,b) show how both the genitive and ergative case function are mapped to the dative case morpheme:

(19) Syncretism in Kabardian

MAX [Case] >> *{Gen, Acc/Erg} >> IDENT [Case], IDENT [Gen/Acc/Erg, Dat],
IDENT [±N], *{Gen, Acc/Erg, Dat}, {Gen}

Table 2(a): GENITIVE mapped to Dative in Kabardian¹¹

Input: GEN	MAX [Case]	*{G, A/E}	ID [Case]	ID [G/A/E, D]	ID [±N]
Nominative	*!			*	
☞ Dative			*	*	
Ergative		*!	*		*
Genitive		*!			

¹⁰ Hindi has an inflectional case-marking system with “direct (i.e. nominative) case”, “oblique (i.e. genitive/ergative/accusative/dative) case”, and “vocative case”. The inflectional case system and the postpositional clitic system illustrated in (18) constitute different layers in the Hindi case-marking system (Masica 1991: Ch.8). See Section 4.4 for further discussion.

¹¹ ‘ID’ in Tables 2(a,b) is an abbreviation for ‘IDENT’. The two markedness constraints, ‘*{Gen, Acc/Erg, Dat}’ and ‘*{Gen}’, are omitted from Tables 2(a,b) for reasons of space. These markedness constraints and the three IDENT constraints constitute a block in which the constraints are not crucially ranked with respect to each other.

Table 2(b): ERGATIVE mapped to Dative in Kabardian

Input: ERG	MAX [Case]	*{G, A/E}	ID [Case]	ID [G/A/E, D]	ID [±N]
Nominative	*!			*	
☞ Dative			*	*	
Ergative		*!			
Genitive		*!	*		*

Let us see how the evaluation proceeds in Tables 2(a,b). The top constraint requires the input has a correspondent in the output and rules out the first candidate (nominative). The third and fourth candidate violate the second-highest ranking constraint, which bans appearance of a genitive, ergative, or accusative case morpheme. This is how the dative emerges as the winner when the genitive or ergative case function is given as input.

The constraint hierarchy in (19) also accommodates a more radical reduction in case-marking system with no modification. For example, Yagnob (Indo-Iranian) goes a step further and displays a broader range of syncretism (Comrie 1981: 169-170); the same case suffix marks transitive actors in ergative constructions, all the oblique NPs, adnominal possessors, and (definite) transitive undergoers in accusative constructions.

4.2 Bengali

Let us proceed to the Bengali case system, in which the same case morpheme marks non-macroroles and adnominal possessors. (20) is the constraint hierarchy for Bengali:

(20) Syncretism in Bengali

MAX [Case] >> *{Gen} >> IDENT [±N] >> IDENT [Gen/Acc/Erg, Dat] >>
IDENT [Case], *{Gen, Acc/Erg}, *{Gen, Acc/Erg, Dat}

Ranking ‘*{Gen}’ between ‘MAX [Case]’ and the IDENT constraints ensures that adnominal possessors receive a non-nominative case morpheme other than the genitive. The difference between Kabardian and Bengali comes down to two factors: the relative ranking of the two markedness constraints, ‘*{Gen}’ and ‘*{Gen, Acc/Erg}’, and of the three IDENT constraints, ‘IDENT [±N]’, ‘IDENT [Gen/Acc/Erg, Dat]’, and ‘IDENT [Case]’.

Tables 3(a,b) show that the genitive and accusative case function are correctly mapped to the dative and accusative case morpheme, respectively:

Table 3(a): GENITIVE mapped to Dative in Bengali

Input: GEN	MAX [Case]	*{G}	ID [±N]	ID [G/A/E, D]	ID [Case]	*{G, A/E}
☞ Dative				*	*	
Accusative			*!		*	*
Genitive		*!	*			*

Table 3(b): ACCUSATIVE mapped to Accusative in Bengali

Input: ACC	MAX [Case]	*{G}	ID [±N]	ID [G/A/E, D]	ID [Case]	*{G, A/E}
Dative				*!	*	
☞ Accusative						*
Genitive		*!	*		*	*

Ranking ‘*{Gen}’ between ‘MAX [Case]’, on the one hand, and ‘IDENT [±N]’ and ‘IDENT [Gen/Acc/Erg, Dat]’, on the other, ensures that Bengali assigns the dative case morpheme to adnominal possessors (GEN). Specifically, Table 3(b) shows that the dative is underspecified with respect to the [N] feature and thereby satisfies ‘IDENT [±N]’, while the accusative fails to satisfy ‘IDENT [±N]’ since it has the [+N] value.

4.3 Inuktitut and Estonian/Finnish

I propose that (21) is the constraint hierarchy responsible for the genitive-ergative syncretism in Inuktitut:

(21) Syncretism in Inuktitut

MAX [Case] >> *{Gen} >> IDENT [Gen/Acc/Erg, Dat] >> IDENT [±N] >>
IDENT [Case] >> *{Gen, Acc/Erg}, *{Gen, Acc/Erg, Dat}

The difference between (20) (Bengali) and (21) (Inuktitut) comes down to the relative ranking of ‘IDENT [±N]’ and ‘IDENT [Gen/Acc/Erg, Dat]’. The consequence of their re-ranking is that when the GEN is given as input, the ergative case morpheme emerges as the winner:

Table 4(a): GENITIVE mapped to Ergative in Inuktitut

Input: GEN	MAX [Case]	*{G}	ID [G/A/E, D]	ID [±N]	ID [Case]	*{G, A/E}
Dative			*!		*	
☞Ergative				*	*	*
Genitive		*!				*

Table 4(b): ERGATIVE mapped to Ergative in Inuktitut

Input: ERG	MAX [Case]	*{G}	ID [G/A/E, D]	ID [±N]	ID [Case]	*{G, A/E}
Dative			*!		*	
☞Ergative						*
Genitive		*!		*	*	*

The dative case morpheme cannot be the optimal candidate in Tables 4(a,b), since it involves markedness reduction and thereby violates ‘IDENT [Gen/Acc/Erg, Dat]’.

I propose that (21) also holds for Estonian and Finnish (except for pronouns), since (21) treats the accusative and ergative together. For example, Finnish has the accusative-genitive syncretism only in lexical nouns. We are able to accommodate the split between pronouns and lexical nouns by proposing a conjoined constraint ‘*{Gen} & *{Lex}’ (under the assumption that lexical nouns are more marked than pronouns) and replacing ‘*{Gen}’ in Tables (4a,b) with the conjoined markedness constraint, as in Table 5:¹²

Table 5: GENITIVE on lexical nouns mapped to Accusative in Finnish

Input: GEN	MAX [Case]	*{G} & *{Lex}	ID [G/A/E, D]	ID [±N]	ID [Case]
Dative			*!		*
☞Accusative				*	*
Genitive		*!			

¹² (8a)-(8c) are ranked lower than ‘IDENT [Case]’ and are omitted from Table 5. We may likewise use ‘*{Gen, Acc/Erg} & *{Lex}’ to describe a case-marking system (e.g. Halkomelem Salish) in which the four-way case-marking system (nom/acc/dat/gen) in pronouns is reduced into the two-way system (nom/dat) in lexical nouns.

4.4 Hindi and Nyungar

What is notable about Hindi is that it displays a clitic-based case-marking system ('Layer II'), composed of a nominative clitic $-\emptyset$, a genitive clitic *-kaa*, a dative/accusative clitic *-ko*, and an ergative clitic *-ne*, on top of its three-way inflectional case-marking system ('Layer I'), illustrated in Table 6 (Masica 1991):¹³

Table 6: Hindi Inflectional Declension (Mohanen 1994: 61, Kachru 2006: 52)

	Word-level Inflection				Phrasal Clitic
	Masculine		Feminine		
	Singular	Plural	Singular	Plural	
Direct (=Nom)	<i>baccaa</i> ('child')	<i>bacce</i>	<i>kanya</i> ('girl')	<i>kanya-ẽ</i>	-Ø
Oblique	<i>bacce</i>	<i>baccô</i>	<i>kanya</i>	<i>kanya-ô</i>	-ko, -ne, -kaa, ...
Vocative	<i>bacce</i>	<i>bacco</i>	<i>kanya</i>	<i>kanya-ô</i>	

(18a)-(18e) show that the oblique forms of nouns (e.g. *bacce* 'child') are used when the whole NPs are marked by a non-nominative clitic.¹⁴ This allows us to take the case clitics as an elaboration on the minimal case-marking system that comprises the nominative and dative:¹⁵

(22) Two-Tiered Case-Marking System in Hindi

Case Function	Case Morpheme	
	Inflection (Layer I)	Phrasal Clitic (Layer II)
NOM	Direct (=Nom)	$-\emptyset$
DAT/ACC	Oblique (=Dat)	<i>-ko</i>
ERG		<i>-ne</i>
GEN		<i>-kaa</i>

Given the dative-accusative syncretism, I propose (23) as the constraint hierarchy for the Hindi case-marking system:

(23) Syncretism in Hindi¹⁶

MAX [Case] >> IDENT [\pm N] >> IDENT [Gen/Acc/Erg, Dat] >> *{Gen, Acc} >>
IDENT [Case] >> *{Gen, Erg}, *{Gen}, *{Gen, Acc/Erg, Dat}

Three points are worth making about (23). First, ranking 'MAX [Case]' above '*{Gen, Acc}' requires that the genitive and accusative case function should be realized by the less marked case clitic (dative). Second, 'IDENT [Gen/Acc/Erg, Dat]' prohibits realization of the genitive case function by the dative case clitic *-ko*, since it would lead to a violation of both of the subconstraints (i.e. 'IDENT [Gen/Acc, Dat]' and 'IDENT [Gen/Erg, Dat]'). This suggests that the top four constraints require the accusative case function to be realized by the dative case clitic, while leaving the genitive case function to be realized faithfully. Third, the ergative case function is realized by the ergative case clitic *-ne*, since this faithful mapping involves no violation of all the constraints except the lowest-ranking one in Tables 7(a-c).

¹³ The oblique forms of nouns in Hindi and other Indo-Aryan languages usually cannot appear alone; they have to co-occur with one of the case clitics (Masica 1991: 239). This seems to suggest the need to treat the nominal declension and the case clitics together as a single (albeit expanded) case-marking system.

¹⁴ The singular direct (nominative) form of 'child' is *baccaa* in (18d).

¹⁵ There has been a controversy over whether the case clitics reviewed above may be analyzed as case markers and whether the genitive clitic *-kaa*, which (unlike the other case clitics) agrees with the possesum in number, gender, and inflectional case-marking, may be analyzed as a case marker (see Mohanen 1994, Payne 1995, and Spencer 2007 for discussion). My view (irrespective of whether to analyze the genitive clitic as a case marker or not) is that the nominal declension illustrated in Table 6 and the clitics listed in (22) combine to yield a complex case-marking system with some kind of **multiple exponence** to be left for future research.

¹⁶ The two markedness constraints, '*{Gen}' and '*{Gen, Acc/Erg, Dat}', are omitted from Tables 7(a-c).

Table 7(a): ACCUSATIVE mapped to Dative in Hindi

Input: ACC	MAX [Case]	ID [\pm N]	ID [G/A/E, D]	*{G, A}	ID [Case]	*{G, E}
☞Dative					*	
Accusative				*!		
Ergative					*	*!
Genitive		*!		*	*	*

Table 7(b): ERGATIVE mapped to Ergative in Hindi

Input: ERG	MAX [Case]	ID [\pm N]	ID [G/A/E, D]	*{G, A}	ID [Case]	*{G, E}
Dative					*!	
Accusative				*!	*	
☞Ergative						*
Genitive		*!		*	*	*

Table 7(c): GENITIVE mapped to Genitive in Hindi

Input: GEN	MAX [Case]	ID [\pm N]	ID [G/A/E, D]	*{G, A}	ID [Case]	*{G, E}
Dative			*!		*	
Accusative		*!		*	*	
Ergative		*!			*	*
☞Genitive				*		*

The Hindi and Nyungar case-marking system are different only with respect to how the accusative and ergative case function are realized. Hindi realizes the accusative case function with the dative case clitic *-ko*, while retaining a distinct ergative case clitic *-ne*. In contrast, Nyungar realizes the ergative case function with the dative case suffix *-ak*, while retaining a distinct accusative suffix. This observation leads us to reverse the relative ranking of ‘*{Gen, Acc}’ and ‘*{Gen, Erg}’ in (23) as in (24):

(24) Syncretism in Nyungar

MAX [Case] >> IDENT [\pm N] >> IDENT [Gen/Acc/Erg, Dat] >> *{Gen, Erg} >>
IDENT [Case] >> *{Gen, Acc}, *{Gen}, *{Gen, Acc/Erg, Dat}

Table 8 shows how (24) leads the ergative case function to be realized by the dative suffix:

Table 8: ERGATIVE mapped to Dative in Nyungar

Input: ERG	MAX [Case]	ID [\pm N]	ID [G/A/E, D]	*{G, E}	ID [Case]	*{G, A}
☞Dative					*	
Accusative					*	*!
Ergative				*!		
Genitive		*!		*	*	*

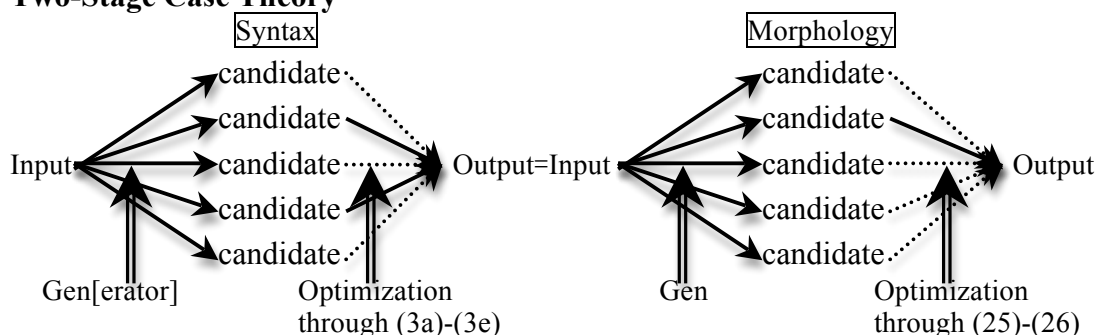
4.5 Summary

I have shown that (8)-(10) allow us to describe the variety of ACS in (11) by attributing the variety of ACS to the relative ranking of the markedness constraints in (8) and the faithfulness constraints in (9) and (10). They are recapitulated in (25) and (26):

- (25) **Markedness Constraints**
- *{Gen}
 - *{Gen, Acc}, *{Gen, Erg} (Shorthand: *{Gen, Acc/Erg})
 - *{Gen, Acc/Erg, Dat}
- (26) **Faithfulness Constraints**
- MAX [Case (=Gen, Acc/Erg, Dat)]
 - IDENT [Case (=Gen, Acc/Erg, Dat)]
 - IDENT [Gen/Acc, Dat] & IDENT [Gen/Erg, Dat]
(Shorthand: IDENT [Gen/Acc/Erg, Dat])
 - IDENT [\pm N]

(27) presents the whole picture of the two-stage case theory proposed in this paper: the left-hand side OT computation outputs the set of case functions available in a given language, which are mapped to their morphological forms by the right-hand side OT computation:

(27) **Two-Stage Case Theory**



5. Extension to Contextual (Case) Syncretism

5.1 The Determiner and Strong Adjective Declensions in German

I will argue in this section that the OT account proposed in the previous section is extendible to the determiner and strong adjective declensions in German in Tables 9(a-c):

Table 9(a): Determiner Declension 1 (e.g. *der* 'the')

	Singular			Plural		
	Masculine	Feminine	Neuter	Masc	Fem	Neut
Nominative	<i>der</i>	<i>die</i>	<i>das</i>	<i>die</i>		
Accusative	<i>den</i>					
Dative	<i>dem</i>	<i>der</i>	<i>dem</i>	<i>den</i>		
Genitive	<i>des</i>		<i>des</i>	<i>der</i>		

Table 9(b): Determiner Declension 2 (e.g. *kein* 'no')

	Singular			Plural		
	Masculine	Feminine	Neuter	Masc	Fem	Neut
Nominative	<i>kein</i>	<i>kein-e</i>	<i>kein</i>	<i>kein-e</i>		
Accusative	<i>kein-en</i>					
Dative	<i>kein-em</i>	<i>kein-er</i>	<i>kein-em</i>	<i>kein-en</i>		
Genitive	<i>kein-es</i>		<i>kein-es</i>	<i>kein-er</i>		

Table 9(c): Strong Adjective Declension (e.g. *gut* 'good')

	Singular			Plural		
	Masculine	Feminine	Neuter	Masc	Fem	Neut
Nominative	<i>gut-er</i>	<i>gut-e</i>	<i>gut-es</i>	<i>gut-e</i>		
Accusative	<i>gut-en</i>					
Dative	<i>gut-em</i>	<i>gut-er</i>	<i>gut-em</i>	<i>gut-en</i>		
Genitive	<i>gut-en</i>		<i>gut-en</i>	<i>gut-er</i>		

These declensions are subject to contextual syncretism not only in case, but also in number and gender and have attracted considerable attention in the literature (e.g. Bierwisch 1967, Wiese 1996, Cahill and Gazdar 1997, Blevins 2000, Müller 2002, 2008, Krifka 2009). The contextual syncretism in Tables 9(a-c) provide an interesting testing ground for an extension of the proposed OT account of the ACS to syncretism in general.

Four observations about Tables 9(a-c) are in order. First, there is no gender distinction in the plural declension. Second, there is no distinct accusative form except in the singular masculine declension. Third, there is no distinction between the dative and genitive in the singular feminine declension. Fourth, there is a parallelism between the singular masculine and singular neuter declension with respect to the dative and genitive form. Finally, there is a parallelism between the singular feminine and plural declension, which is disrupted by the plural dative marked by the weak suffix. These five observations hold for all of Tables 9(a-c):

- (28) Five Observations about Tables 9(a-c)
- a. No gender distinction in the plural declension
 - b. No distinct accusative form except in the singular masculine declension
 - c. Identity of the dative and genitive form in the singular feminine declension
 - d. Parallelism between the singular masculine and singular neuter declension with respect to their dative and genitive form
 - e. Parallelism between the singular feminine and plural declension (disrupted by the plural dative form)

Furthermore, Tables 9(a-c) stand in contrast with respect to four shaded cells: the singular masculine/neuter genitive (represented by the darker shading) and the singular masculine/neuter nominative (represented by the lighter shading):¹⁷

- (29) Two Differences among Tables 9(a-c)
- a. Table 9(b) uses the same form to represent the singular masculine/neuter nominative, while Tables 9(a,c) do not.
 - b. Table 9(a,b) use the *-es* suffix to represent the singular masculine/neuter genitive, while Table 9(c) uses the *-en* (weak) suffix to do so.

These seven observations call for a principled explanation.

5.2 Constraints for Contextual Syncretism in Number and Gender

In order to describe the determiner and adjective declensions in Tables 9(a-c), I first introduce two markedness hierarchies in (30a,b) as the starting point and propose to derive two sets of markedness constraints in (31a,b) from (30a,b):

- (30) a. **Gender Hierarchy [GH]** (Steinmetz 1985, 2006)
Masc[uline] < Fem[inine] < Neut[er]
b. **Number Hierarchy [NH]** (Corbett 2000)
Sing[ular] < Pl[ural]
- (31) **Markedness Constraints** (derived from the GH and NH)
- a.
 1. *{Neut}
 2. *{Neut, Fem}
 3. *{Neut, Fem, Masc}
 - b.
 1. *{Pl}
 2. *{Pl, Sing}

¹⁷ It is beyond the scope of this paper to give an OT account of the mixed adjective declension (which appears when an adjective occurs with a noun and a determiner such as *ein* ‘a/an’ and *kein* ‘no’) and the weak adjective declension (which appears when it occurs with a noun and a determiner such as *der* ‘the’).

Second, I propose two types of faithfulness constraints in (32), which compete against the markedness constraints in (31):

- (32) **Faithfulness Constraints** (Gender and Number)
- a. MAX [Gender], MAX [Number]
 - b. IDENT [Gender], IDENT [Number]

Third, in order to account for the fact that German exhibits a split-marking in which only singular, masculine NPs have a distinct accusative form, I follow Krifka (2009: 152-158) (cf. Wunderlich 2004) in assuming that the German adjective and determiner declension involve a morphologized, animacy-based and number-based split.¹⁸ Under this assumption, I propose two **harmony scales** in (33):

- (33) **Harmony Scales** (derived through the harmonic alignment)
- a. U[ndergoer]/Neut > U/Fem > U/Masc
 - b. U[ndergoer]/Pl > U/Sing

(33a,b) are derived from an alignment of the **macrorole hierarchy** ('Actor > Undergoer') (Van Valin and LaPolla 1997) with the GH (which morphologizes the animacy hierarchy) and the NH. We may turn these harmony scales into markedness constraints in (34a,b):¹⁹

- (34) **Markedness Constraints** (derived from the harmony scales in (33))
- a. *U/Masc >> *U/Fem >> *U/Neut
 - b. *U/Sing >> *U/Pl

I propose to conjoin (34a,b) with (8c) into (35a)-(35c):

- (35) **Complex Markedness Constraints** (derived through constraint conjunction)
- a. *{U/Neut} & *{Gen, Acc/Erg, Dat}
 - b. *{U/Fem} & *{Gen, Acc/Erg, Dat}
 - c. *{U/Pl} & *{Gen, Acc/Erg, Dat}

(35a)-(35c) are complex markedness constraints that are violated only when both of the sub-constraints are violated. They ensure that non-masculine and plural undergoers receive nominative case, given that their left sub-constraints, i.e. '*{U/Neut}', '*{U/Fem}', and '*{U/Plural}', cannot be violated in German (cf. Aissen 2003).²⁰

Finally, I propose another set of complex markedness constraints in (36), which select each one of (8a)-(8c), (31a1)-(31a3), and/or (31b1)-(31b2) and combine them in terms of constraint conjunction (Smolensky 1995):²¹

- (36) a. *{Gen} & *{Neut, Fem}
- b. *{Gen} & *{Pl}
 - c. *{Gen, Acc/Erg, Dat} & *{Neut}

¹⁸ Krifka (2009: 158) argues that the functional need for case distinction between nominative and accusative was far less pressing for feminines than for masculines. See Jäger (2004) for a suggestion of how an initially animacy-based split is morphologized.

¹⁹ See Hopper and Thompson (1980) for a proposal to view the number opposition as prominence-related. These hierarchies are prominence hierarchies and this justifies deriving (33a,b) from their harmonic alignments.

²⁰ I assume that these constraints are derivable from a bidirectional interaction between a set of discourse constraints (e.g. '*{U/Animate}', '*{U/Definite}', '*{U/LocalPerson}')) (cf. Jäger 2004) and the set of case assignment constraints in (3). I will leave it to another occasion to describe the split marking with no use of constraint conjunction as illustrated in (35a)-(35c).

²¹ Logically, it is possible to combine two (or three) markedness constraints, each of which belongs to either (8), (31a), or (31b) through constraint conjunction, on a language-particular basis.

These and other similar conjoined constraints identify the “worst-of-the-worst” combinations of the case, number, and/or gender value and leave it up to the other constraints to decide how to avoid the “worst-of-the-worst”. They recast the language-particular aspects of syncretic patterns as differential combinations of the markedness constraints in (8) and (31a,b).

Taken together, (8), (9), (31), (32), (35), and (36) (recapitulated in (37)-(39) below) constitute a set of constraints for describing the contextual syncretism in Tables 9(a-c):

- (37) **Markedness Constraints** (= (8) and (31))
- a. *{Gen}, *{Gen, Acc}, *{Gen, Erg}, *{Gen, Acc/Erg, Dat}
 - b. *{Neut}, *{Neut, Fem}, *{Neut, Fem, Masc}
 - c. *{Pl}, *{Pl, Sing}
- (38) **Complex Markedness Constraints** (= (35) and (36))
- a.
 - 1. *{U/Neut} & *{Gen, Acc/Erg, Dat}
 - 2. *{U/Fem} & *{Gen, Acc/Erg, Dat}
 - 3. *{U/Plural} & *{Gen, Acc/Erg, Dat}
 - b.
 - 1. *{Gen} & *{Neut, Fem}
 - 2. *{Gen} & *{Pl}
 - 3. *{Gen, Acc/Erg, Dat} & *{Neut}
- (39) **Faithfulness Constraints** (= (9) and (32))
- a. MAX [Case], IDENT [Case]
 - c. MAX [Gender], IDENT [Gender]
 - c. MAX [Number], IDENT [Number]

In the next subsection, I will refer to ‘IDENT [Case]’ in (9b) (repeated here as part of (39a)), but not to (10a,b), since the German declension data don’t require us to refer to (10a,b).

5.3 An OT Account of the Strong Adjective and Determiner Declension

5.3.1 Domain of Optimization

I will first propose an OT account of the strong adjective declension in Table 9(c) and will extend the OT account to the determiner declensions in Tables 9(a,b).

As a groundwork for the OT account to be proposed, it is worthwhile having a look at the nominal declensions in German:

Tables 10(a-c): Nominal Declensions of Masculine, Feminine, and Neuter Nouns

a. <i>der Vater</i> ‘father’			b. <i>die Mutter</i> ‘mother’		c. <i>das Kind</i> ‘child’	
	Singular	Plural	Singular	Plural	Singular	Plural
NOM	<i>Vater</i>	<i>Väter</i>	<i>Mutter</i>	<i>Mütter</i>	<i>Kind</i>	<i>Kind-er</i>
ACC	<i>Vater</i>	<i>Väter</i>	<i>Mutter</i>	<i>Mütter</i>	<i>Kind</i>	<i>Kind-er</i>
DAT	<i>Vater</i>	<i>Väter-n</i>	<i>Mutter</i>	<i>Mütter-n</i>	<i>Kind</i>	<i>Kind-er-n</i>
GEN	<i>Vater-s</i>	<i>Väter</i>	<i>Mutter</i>	<i>Mütter</i>	<i>Kind-(e)s</i>	<i>Kind-er</i>

It is important to observe here that both the singular masculine/neuter genitive and the plural masculine/feminine/neuter dative form of nouns exhibit both a number and case index and that these indices alone suffice to identify the singular genitiveness and plural dativeness.

Table 9(c): Strong Adjective Declension (e.g. *gut* ‘good’)

	Singular			Plural		
	Masculine	Feminine	Neuter	Masc	Fem	Neut
Nominative	<i>gut-er</i>	<i>gut-e</i>	<i>gut-es</i>	<i>gut-e</i>		
Accusative	<i>gut-en</i>					
Dative	<i>gut-em</i>	<i>gut-er</i>	<i>gut-em</i>	<i>gut-en</i>		
Genitive	<i>gut-en</i>		<i>gut-en</i>	<i>gut-er</i>		

The fact that the weak suffix appears in Table 9(c) where the co-occurring noun involves its case index allows us to propose that the adjective and noun combine to form a phrasal domain of optimization to which the constraint hierarchy to be proposed below applies (cf. Hughes 2003). This proposal obviates the need for the singular masculine/neuter genitive and plural dative form of the strong adjective declension to bear any case value, since the phrasal domain may receive the case value from either the adjectival or nominal declension.

Let us next consider how the gender and number values are distributed over an adjective and a noun. First, the gender value of the noun belongs to a class of **controller genders**, the genders into which nouns are divided, while that of the adjective belongs to a class of **target genders**, the genders that are marked on adjectives (Corbett 1991). Likewise, the number value of the noun belongs to a class of **controller numbers**, while that of the adjective belongs to a class of **target numbers** (Corbett 2000: 171-188).²² This means that the adjective and noun form two distinct domains for the gender/number assignment and that the adjectival domain (i.e. **target domain**) alone is subject to the optimization process:²³

Table 11: Domains of Optimization for the Case, Number, and Gender Assignment

	Case	Number	Gender
Adjective	Phrasal	Target Number	Target Gender
Noun		Controller Number	Controller Gender

The shaded portions in Table 11 represent the domains for the case, gender, and number assignment in an NP composed of an adjective and a noun: the case values are assigned to the phrasal domain, while the gender and number values are assigned to the adjectival domain.

The consequence of this is that the faithfulness constraints in (39) have to be specified for the domains to which they apply. I will use the case-related faithfulness constraints in (40a) and the gender/number-related faithfulness constraints in (40c,d) in the description of the strong adjective declension:

(40) **Faithfulness Constraints** (Revised from (39))

- a. MAX_{Phrasal} [Case], IDENT_{Phrasal} [Case]
- b. MAX_{Lexical} [Case], IDENT_{Lexical} [Case]
- c. MAX [Gender], IDENT [Gender]
- d. MAX [Number], IDENT [Number]

5.3.2 The Constraint Hierarchy for the Strong Adjective Declension

Given (37), (38), and (40), I propose that Tables 12(a,b) are, respectively, an input and output of the constraint hierarchy in (41). The underlined values in Table 12(b) have changed as the result of the optimization, while the encircled case values (the singular masculine/neuter genitive and the plural dative) in Table 12(b) come from the nominal declension:

Table 12(a): **Input** [Syntactic Feature Bundles]

	Singular			Plural		
	Masc	Fem	Neut	Masc	Fem	Neut
Nom	SG/M/Ø	SG/F/Ø	SG/N/Ø	PL/M/Ø	PL/F/Ø	PL/N/Ø
Acc	SG/M/ACC	SG/F/ACC	SG/N/ACC	PL/M/ACC	PL/F/ACC	PL/N/ACC
Dat	SG/M/DAT	SG/F/DAT	SG/N/DAT	PL/M/DAT	PL/F/DAT	PL/N/DAT
Gen	SG/M/GEN	SG/F/GEN	SG/N/GEN	PL/M/GEN	PL/F/GEN	PL/N/GEN

²² The controller gender and number don't always coincide with the target gender and number, respectively. Romanian neuter nouns take the masculine value in the singular, while taking the feminine value in the plural (Hall 1965). See Corbett (2006: 153) for examples of the number mismatch from Jingulu (Pensalfini 2003).

²³ The controller gender and number stay the same and therefore are not subject to optimization. I also take the nominal declension, especially its singular non-feminine genitive forms (e.g. *Văter-s*) and plural dative forms (e.g. *Văter-n*), as something given that is beyond the scope of this paper.

Constraint Hierarchy in (41)



Table 12(b): **Output** [Morphological Feature Bundles]

	Singular			Plural		
	Masc	Fem	Neut	Masc	Fem	Neut
Nom	SG/M/Ø	SG/F/Ø	SG/N/Ø	PL/M/Ø	PL/F/Ø	PL/N/Ø
Acc	SG/M/ACC	SG/F/Ø	SG/N/Ø	PL/M/Ø	PL/F/Ø	PL/N/Ø
Dat	SG/M/DAT	SG/F/DAT	SG/M/DAT	PL/M/DAT	PL/F/DAT	PL/M/DAT
Gen	SG/M/GEN	SG/F/DAT	SG/M/GEN	PL/M/DAT	PL/F/DAT	PL/M/DAT

(41) Constraint Hierarchy for the Strong Adjective Declension in Table 9(c)

MAX [Gender], MAX [Number], IDENT [Number], (38a1), (38a2), (38a3),
*{Gen} & *{Neut, Fem}, *{Gen} & *{Pl}, *{Gen, Acc/Erg, Dat} & *{Neut}



MAX_{Phrasal} [Case], *{Neut, Fem, Masc}, *{Pl}, *{Pl, Sing}



IDENT [Gender], *{Gen, Acc/Erg, Dat}



IDENT_{Phrasal} [Case], *{Neut, Fem}, *{Neut}



*{Gen}, *{Gen, Acc/Erg}

Table 12(c) represents the morphological feature bundles borne by the adjective, which are obtained by deleting from Table 12(b) the case values that come from the nominal declension and filling in the nominative where no other case value is available in the phrasal domain:

Table 12(c): Morphological Feature Bundles Borne by the Adjective

	Singular			Plural		
	Masc	Fem	Neut	Masc	Fem	Neut
Nom	SG/M/NOM	SG/F/NOM	SG/N/NOM	PL/M/NOM	PL/F/NOM	PL/N/NOM
Acc	SG/M/ACC	SG/F/NOM	SG/N/NOM	PL/M/NOM	PL/F/NOM	PL/N/NOM
Dat	SG/M/DAT	SG/F/DAT	SG/M/DAT	PL/M/Ø	PL/F/Ø	PL/M/Ø
Gen	SG/M/Ø	SG/F/DAT	SG/M/Ø	PL/M/DAT	PL/F/DAT	PL/M/DAT

The constraint ranking in (41) accounts for (28b)-(28d). Specifically, (28b) is derived from the set of conjoined constraints in (38a), which realize a split marking determined by animacy and number, (28c) is derived from the conjoined constraint ‘*{Gen} & *{Neut, Fem}’, which turns the combination of the genitive and feminine into that of the dative and feminine. Finally, (28d) is derived from the conjoined constraint ‘*{Gen, Acc/Erg, Dat} & *{Neut}’

Given Table 12(c), I propose that the morphological feature bundles in Table 12(c) are mapped to the following phonological exponents:

(42) Phonological Exponents for the Strong Adjective Declension

- a. *-er₁* [Sing, Masc, Nom]
- b. *-em* [Sing, Masc, Dat]
- c. *-es* [Sing, Neut, Nom]
- d. *-e* [Ø, Ø, Nom]
- e. *-er₂* [Ø, Ø, Dat]
- f. *-en* [Ø, Ø, Ø]

(42a)-(42c) are straightforward and require no explanation. (42d) covers the nominative forms in the singular feminine and plural declension. Likewise, (42e) covers the dative forms in the singular feminine and plural declension. Finally, (42f) is an elsewhere exponent and applies to

those six shaded cells in Table 12(c) that are not covered by (42a)-(42e) and share no case, number, or gender value: the singular masculine/neuter genitive, the plural dative, and the singular masculine accusative.

It is important to note that (42a)-(42e), taken together, account for (28a,e). Specifically, the fact that (42a,c) are more specific than (42d) leaves no choice but for (42d) to apply to the singular feminine and plural declension under the assumption of the **morphological blocking principle** (Andrews 1990). Likewise, (42b) forces (42e) to apply to both of the singular feminine and plural declension. All this shows that (28a,e) are attributable to the interaction between (42a)-(42c) (which apply to the singular masculine and neuter declension) and (42d,e) (which apply to the singular feminine and plural declension).

5.3.3 The Constraint Hierarchies for the Determiner Declensions

The determiner declension in Table 9(a) and the adjective declension in Table 9(c) differ only in one respect: the former uses the *-es* suffix to mark the singular non-feminine genitive, while the latter uses the *-en* (weak) suffix to do so. We may take this contrast as an indication that a determiner and a noun constitute a phrasal domain for the case assignment in the plural declension, while they do not for the case assignment in the singular declension. Table 13 indicates the domains for the case, number, and gender assignment for *der* ‘the’:

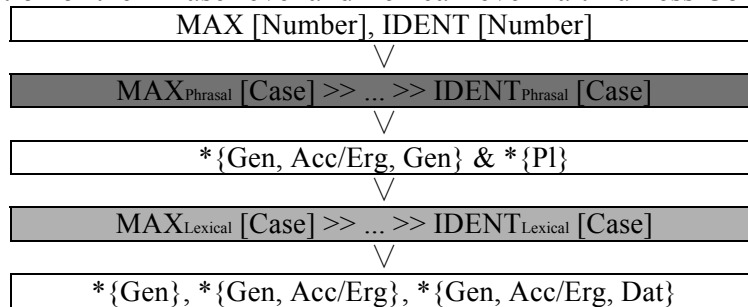
Table 13: Domains of Optimization for the Case, Number, and Gender Assignment

	Case		Number	Gender
	Singular	Plural		
Determiner	Lexical	Phrasal		
Noun				

The question is how to capture the contrast between the singular and plural declension with respect to the case assignment in terms of constraint ranking. There are two observations to be made with respect to the case assignment of *der* ‘the’. First, the plural declension is more marked than the singular declension. Second, the case values in the plural declension of *der* ‘the’ are reduced to the nominative and dative in Table 9(a).

These two observations lead us to propose a conjoined markedness constraint ‘*{Gen, Acc/Erg, Dat} & *{Pl}’, which bans a combination of the dative and plural, and to interpolate the conjoined constraint between the phrasal-level faithfulness constraints in (40a) and the lexical-level faithfulness constraints in (40b), as in (43):

(43) Interaction of the Phrase-level and Lexical-level Faithfulness Constraints



The top stratum dictates that the number distinction is maintained under any circumstance. The second stratum (‘MAX_{Phrasal} [Case] >> ... >> IDENT_{Phrasal} [Case]’) requires that a certain case value is available in the phrasal domain and leaves it open whether the case value comes from the nominal or adjectival declension. These two strata lead the third stratum (‘*{Gen, Acc/Erg, Dat} & *{Pl}’) to ban the occurrence of any non-nominative case value in the plural when a certain case value is available from the nominal declension; the adjectival declension

bears no case value in the plural context when the dative case value comes from the nominal domain.²⁴ The fourth stratum (‘MAX_{Lexical} [Case] >> ... >> IDENT_{Lexical} [Case]’) outranks all the case-related markedness constraints in the bottom stratum and dictate that the adjectival declension bears a certain case value in the singular.

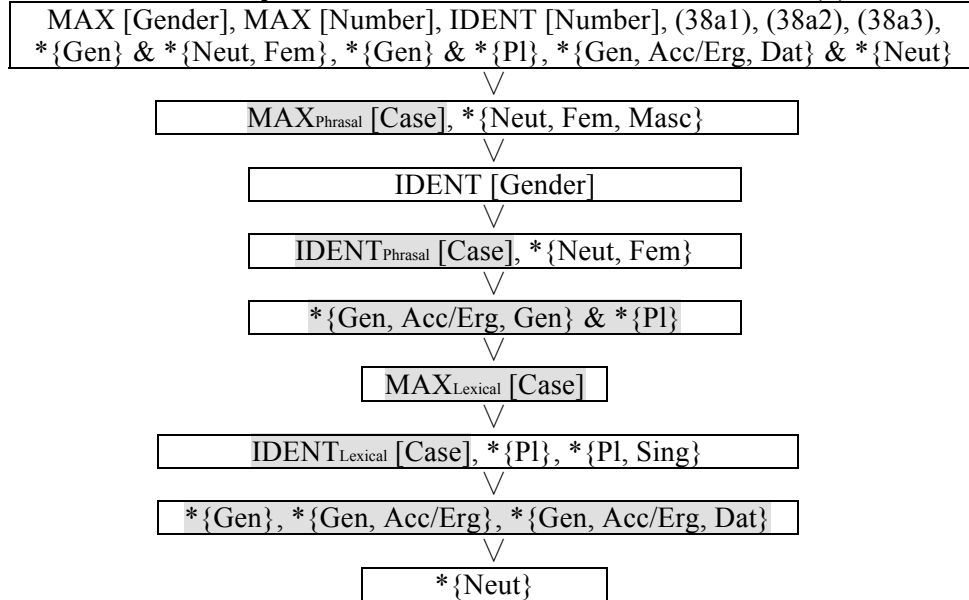
Given the above discussion, we are ready to account for (29b), repeated below:

- (29) b. Table 9(a,b) use the *-es* suffix to represent the singular masculine/neuter genitive, while Table 9(c) uses the *-en* (weak) suffix to do so.

The contrast between Tables 9(a,b) and Table 9(c) with respect to the singular non-feminine genitive comes down to the position of the lexical-level faithfulness constraints, ‘MAX_{Lexical} [Case] >> ... >> IDENT_{Lexical} [Case]’. These two constraints outrank the three case-related markedness constraints in the determiner declensions (Table 9(a,b)), while they are outranked by the same markedness constraints in the adjectival declension (Table 9(c)).

Interdigitating (43) with (41) brings about (44), a constraint ranking for the determiner declension in Table 9(a). Those constraints that appear in (43) are shaded lightly:

- (44) Constraint Hierarchy for the Determiner Declension in Table 9(a)²⁵



(44) receives the set of syntactic feature bundles in Table 12(a) as input and outputs the set of morphological feature bundles borne by the determiner *der* ‘the’ in Table 14(a):²⁶

Table 14(a): Morphological Feature Bundles Borne by the Determiner *der* ‘the’

	Singular			Plural		
	Masc	Fem	Neut	Masc	Fem	Neut
Nom	SG/M/NOM	SG/F/NOM	SG/N/NOM	PL/M/NOM	PL/F/NOM	PL/N/NOM
Acc	SG/M/ACC	SG/F/NOM	SG/N/NOM	PL/M/NOM	PL/F/NOM	PL/N/NOM
Dat	SG/M/DAT	SG/F/DAT	SG/M/DAT	PL/M/Ø	PL/F/Ø	PL/M/Ø
Gen	SG/M/GEN	SG/F/DAT	SG/M/GEN	PL/M/DAT	PL/F/DAT	PL/M/DAT

²⁴ If no case value is obtained from the nominal declension in the plural context (e.g. the plural genitive), the adjectival declension is forced to bear a case value in compliance with ‘MAX_{Phrasal} [Case]’, which outranks the conjoined markedness constraint ‘*{Gen, Acc/Erg, Gen} & *{Pl}’.

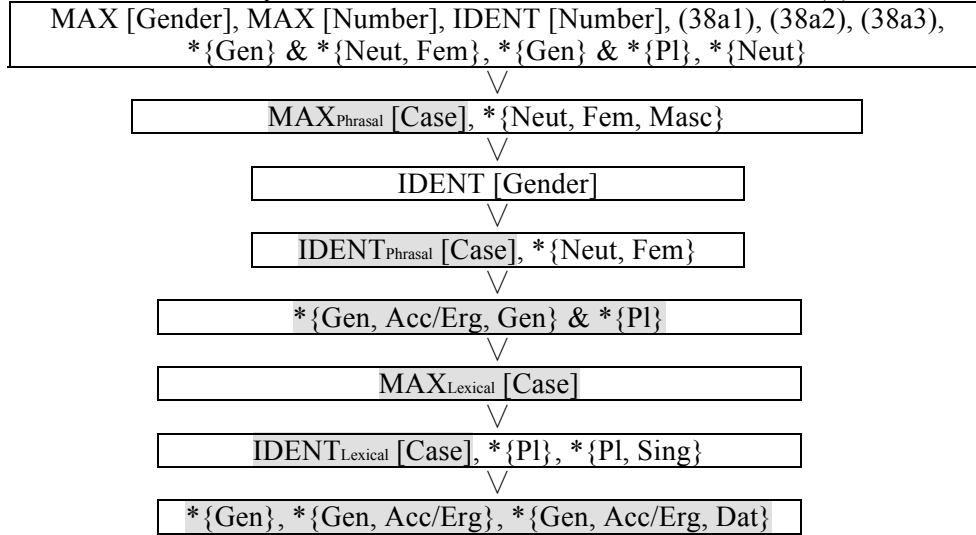
²⁵ ‘*{Gen, Acc/Erg, Dat}’, ‘*{Pl}’, and ‘*{Pl, Sing}’ in (43) are moved from their original positions in (41). Their movement is necessitated by an assumption made by Smolensky (1995) that a locally conjoined constraint (‘*{Gen, Acc/Erg, Dat} & *{Pl}’) has to outrank their subconstraints (‘*{Gen, Acc/Erg, Dat}’, ‘*{Pl}’).

²⁶ (44) outputs the set of morphological feature bundles in Table 14(a) PLUS the dative case value in the plural declension that comes from the nominal domain.

The two shaded cells in Table 14(a) are what distinguish the set of morphological feature bundles borne by the determiner *der* ‘the’ from that borne by the adjective.

Finally, we are ready to account for (29a). My proposal is that the difference between Table 9(a) and Table 9(b) comes down to the relative ranking of ‘*{Neut}’; it is placed at the bottom stratum in Table 9(a), while it is at the top stratum in Table 9(b). (45) is a constraint ranking for the determiner declension in Table 9(b):

(45) Constraint Hierarchy for the Determiner Declension in Table 9(b)



The movement of ‘*{Neut}’ to the top stratum and its replacement of ‘*{Gen, Acc/Erg, Dat} & *{Neut}’ results from generalization: the ban on the appearance of the neuter value is restricted to the genitive, accusative, and dative in the declension of *der* ‘the’, while it is extended to include the nominative in the declension of *kein* ‘no’.

The consequence of this extension is that the neuter value is not available in the singular declension of *kein* ‘no’. The five shaded cells in Tables 14(b) are what distinguish the set of morphological feature bundles borne by *kein* ‘no’ from that borne by the adjective:

Table 14(b): Morphological Feature Bundles Borne by the Determiner *kein* ‘no’

	Singular			Plural		
	Masc	Fem	Neut	Masc	Fem	Neut
Nom	SG/M/NOM	SG/F/NOM	SG/M/NOM	PL/M/NOM	PL/F/NOM	PL/N/NOM
Acc	SG/M/ACC	SG/F/NOM	SG/M/NOM	PL/M/NOM	PL/F/NOM	PL/N/NOM
Dat	SG/M/DAT	SG/F/DAT	SG/M/DAT	PL/M/Ø	PL/F/Ø	PL/M/Ø
Gen	SG/M/GEN	SG/F/DAT	SG/M/GEN	PL/M/DAT	PL/F/DAT	PL/M/DAT

Given Tables 14(a,b), I propose that the sets of morphological feature bundles in Table 14(a,b) are mapped to a set of phonological exponents in (46):

(46) Phonological Exponents for the Determiner Declensions

- | | | |
|----|-------------------------|-------------------|
| a. | kein/der ₁ | [Sing, Masc, Nom] |
| b. | keinem/dem | [Sing, Masc, Dat] |
| c. | keines/des | [Sing, Masc, Gen] |
| d. | das | [Sing, Neut, Nom] |
| e. | keine/die | [Ø, Ø, Nom] |
| f. | keiner/der ₂ | [Ø, Ø, Dat] |
| g. | keinen/den | [Ø, Ø, Ø] |

We may combine (42) and (46) into (47):

(47) Phonological Exponents for the Determiner and Strong Adjective Declensions

- a. *ein/der₁/-er₁* [Sing, Masc, Nom]
- b. *keinem/dem/-em* [Sing, Masc, Dat]
- c. *keines/des* [Sing, Masc, Gen]
- d. *das/-es* [Sing, Neut, Nom]
- e. *keine/die/-e* [Ø, Ø, Nom]
- f. *keiner/der₂/-er₂* [Ø, Ø, Dat]
- g. *keinen/den/-en* [Ø, Ø, Ø]

Given (47), we may be able to summarize the syntax-morphology-phonology mapping in the German strong adjective and determiner declensions, as in Table 15: ²⁷

Table 15: Syntax-Morphology-Phonology Mapping in the Three German Declensions

Syntax	⇒	Constraint Ranking		⇒	Morphology	⇒	Phonology
(4a)=Table 12(a)	→	Strong Adj.	(41)	→	Table 12(c)	(47)	Table 9(c)
		<i>der</i> ‘the’	(44)	→	Table 14(a)		Table 9(a)
		<i>kein</i> ‘no’	(45)	→	Table 14(b)		Table 9(b)

6. Conclusion

I have provided a unified OT account of the variety of absolute case syncretism in (11) and the German strong adjective and declensional paradigm in Tables 9(a-c), an oft-discussed example of contextual syncretism.

Specifically, I have attempted to attribute both the absolute case syncretism in (11) and the contextual syncretism in Tables 9(a-c) to the interaction among the set of stringently formulated markedness constraints in (37) derived directly from the CH, GH, and NH, the set of corresponding faithfulness constraints (i.e. MAX and IDENT constraints) in (39), the set of complex markedness constraints in (38a) that are derived through constraint conjunction of each one constraint from (37a), (37b), and/or (37c), and the set of complex markedness constraints in (38b) derived from conjoining the harmonically aligned constraints in (34) and one of the markedness constraints in (37a) that bans the appearance of any non-nominative case morpheme.

²⁷ It is worth noting in this connection that the singular non-feminine genitive of the strong adjective declension is marked by the *-es* suffix in Middle High German (Walshe 1974). This observation allows us to speculate that the German strong adjective declension has been integrated into the phrasal domain (as far as the case assignment is concerned), while the determiner declensions are in the process of being integrated into the phrasal domain. It is also interesting to note in this connection that some German determiners (e.g. *jeder* ‘each’) may bear either the *-es* suffix (corresponding to (47c)) or *-en* suffix (corresponding to (47g)) when they co-occur with singular non-feminine genitive NPs (Gallmann 1998).

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**The layered structure of the Modern Irish word:
An RRG account of derivational morphology based on lexeme
constructional schemata**

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Abstract

This paper examines derivation in Modern Irish within a layered structure of the word (LSW) in a way analogous to the layered structure of the noun phrase and the layered structure of the clause in RRG. In addition to characterising elements of derivational morphology of Irish, we examine the role of the lexicon and the need for a morpheme inventory and lexeme store in the lexicon. We consider derivation within an account that addresses the formation of nominals and other lexical categories.

Under derivation, we discuss how a new member of a lexical category is formed, and how lexical meaning may be modified within the LSW in RRG. We indicate in our conceptualisation of the layered structure of the word how it would operate in support of derivation. We discuss the need for an inventory of morphological constructional schemata for lexemes, similar to the syntactic inventory, such that morphemes that carry semantic or conceptual meaning might be suitably represented in a lexeme store within the lexicon. That is, we argue that morphemes with a meaningful semantics or a concept definition, that is, lexemes, are to be found within the lexicon and formulated as concepts of a specific category type compatible with Qualia Theory, and the recent Lexical Constructional templates of Mairal et al (Mairal Usón, and Ruiz de Mendoza 2008, 2009), and connect with the RRG linking system.

The basic theory of RRG is to be found in Van Valin and LaPolla (1997) and Van Valin (2005), including accounts of the layered structure of the clause (LSC), the layered structure of the noun phrase (LSNP) and Qualia Theory (Pustejovsky 1995). We intend that our account of the Modern Irish data in the layered structure of the word be compatible with the LSNP and the LSC, within RRG.

1. Introduction

This paper examines elements of the layered structure of the word of Modern Irish. While characterising elements of the morphology of Irish we also motivate that part of RRG concerned with morphology and its relationship to the lexicon and the morpheme inventory. We extend the RRG theory specifically by partially proposing a sub-theory of morphology, that is functionally oriented through the use of morphological constructional templates ('schemata'), and that is intended to connect in a compatible way with the main RRG model. While examining the Irish data for derivation, we explore the general question: 'What should be included in an RRG theory of morphology?'

The basic theory of RRG is to be found in Van Valin and LaPolla (1997) and Van Valin (2005), including accounts of the layer structure of the clause (LSC), the layer structure of the noun phrase (LSNP) and qualia theory (Van Valin 2005: 51ff). We intend that our account of the layered structure of the word (LSW) be compatible with the LSNP and the LSC.

Any well-motivated theory based account of morphological processes and phenomena should be at least able to account for (1).

- (1) An RRG theory of morphology must account for
 - a. Derivation and morphological category changing devices
 - b. The role of the RRG lexicon within a morphological perspective
 - c. A means of representing the semantic meaning of lexemes in the lexicon
 - d. Inflection processes in support of grammatical phenomena
 - e. A language specific morpheme inventory within the grammar
 - f. Compounding and incorporation in grammar
 - g. Word formation in Semitic languages
 - h. The phonological word and clitics

In this paper, however, we concern ourselves solely with an RRG account of morphological derivation within the scope boundaries of that provided by the Irish data. That is, we are concerned with (1a) to (1c) in the list above. We consider lexemes in the lexicon and the status of the morpheme inventory. We touch upon compounding (1f), considered as an instance of derivation.

2. The role of morphology in grammar

Morphology is the part of linguistics that deals with word structure, word formation, the internal structure of words, and the identification and study of morphemes. As such, it has interfaces to semantics, syntax and phonology. A definition of a word is that it is the smallest free form found in a language. A single word can have multiple uses and interpretations and will have a lexical category. Identical sounding words may belong to multiple categories.

Lexical information is basic information about a word. RRG expresses this information in the lexicon using, for example, logical structures to represent a verb and qualia theory to denote a lexicon entry for a noun. Sentences are formed compositionally by combining words according to a pattern determined by the rules of syntax of a particular language. We can define a word syntactically as: ‘the smallest unit of a language that can stand alone’. We recognise the ability of words to stand-alone by saying that they are free forms. Units that are incapable for standing alone (i.e., affixes) are called bound forms. Some morphologically relevant terminology is introduced as follows.

A morpheme is a word or meaningful piece of a word that cannot be divided into smaller meaningful parts. An alternative definition would claim that a morpheme is a pairing between meaning and sound. A lexeme is a morpheme having lexical meaning rather than simple grammatical purpose. Morphemes that are not words (i.e. those that are bound) are called affixes.

Depending on their position, we can have a prefix, suffix, infix (2), and circumfix. An affix can be category-sensitive (3). Circumfixes come in two parts -one part attaches to the front of the word and the other to the back. It is possible to analyse these as a prefix and a suffix that apply to a stem simultaneously (4). A stem, therefore, is the part of a word to which affixes attach. Affixes attach to stems and the most embedded stem in a complex word is the root (i.e. it is a simple stem). Roots belong to lexical categories i.e. nouns, verbs, adjectives,

prepositions (5). We indicate these affixes in bold in examples (2) – (5), to highlight them. Morphological inflection involves the formation of grammatical forms (past, present, future, singular, plural, masculine, feminine, neuter, etc. of a single lexeme). The use of these grammatical forms is generally dictated by the sentence structure, for example, active vs. passive clause. One way inflection is realised is through affixes (2) while derivation involves the creation of one lexeme from another (3), (4) and (5).

- (2) gluaisteán ‘car’ (N.sg) – gluaisteáin ‘cars’ (N.pl)
- (3) a. banc ‘bank’ (N.sg) – baincéir ‘banker’ (N.sg)
 b. baincéir ‘banker’ (N.sg) – baincéireacht ‘banking’ (VN)
 c. bÁCáil ‘bake’ (V.past) – bÁCéir ‘baker’ (N.sg)
 d. scríobh ‘write’ (V.past) – scríbhneoir ‘writer’ (N.sg)
 e. cáiréis ‘care’ (N) – cáiréiseach ‘careful’ (Adj, stem)
- (4) easaontas ‘disagreement’:
 a. aontaigh ‘agree’ V.past
 b. easaontas ‘dis+agree+ment’ N
 c. easaontaigh ‘dis-agree’ V.past
 d. aontú ‘agree-ment’ N
- (5) Examples of words and derivational affixes.
- | | | |
|-----------|---------------------|--------------------------|
| N → N | iasc → iascaireacht | fish → fishery |
| | freagra → freagrach | answer → answerable |
| | oileán → oileánach | island → islander |
| V → V | íoc → reamhioc | pay → prepay |
| | chéimí → fóchéimí | graduate → undergraduate |
| Adj → Adj | gné → fóghne | species → subspecies |
| N → Adj | tarbh → tarbhach | bull → bullish |
| | anam → anamach | soul → soulful |
| V → N | damhsaigh → damsa | dance → dance |
| Adj → Adv | brón → brónach | sad → sadly |

Word formation and lexeme formation both refer to derivation. Inflection is usually distinguished from derivation by application of the following general criteria.

- (6) Criteria for distinguishing inflection from derivation
- The application (or non-application) of inflectional morphology usually depends on the syntactic context (i.e., is the subject of a verb sg or pl, m or f, 1/2/3rd?).
 - The application of derivational morphology does not depend on the syntactic context.
 - Derivation generally results in i) a change in lexical meaning, or ii) the lexical category is changed for a particular word.

We examine derivation first in the next section, and propose a model of the layered structure of the word (LSW) to support the discussion.

3. Derivation - Morphological category changing devices

3.1 The nature of derivation

In derivation, a category may be regarded as a morphological constructional or ‘device’ that provides the ‘part of speech’ category type of the word that it creates. Derivational affixes (lexemes) have semantics, are recorded in the lexicon, and work with the linking system of RRG. Derivational category affixes have a structure where the input morphological lexeme argument is morphologically fused with the category affix to produce a new lexeme as output. Derivation creates new lexemes and usually changes the lexeme class whereas inflection creates different forms of the same lexeme, for grammatical purposes. The input to derivation is a single lexeme.

We make some key assumptions (7) while motivating our account.

- (7) Assumptions regarding derivational morphology in RRG
1. The derivational category affix may be considered as a construction that contains skeletal structure (a ‘slot’) for an input lexeme in a sort changing derivation. By sort changing we mean that the ‘part of speech’ is usually changed from one *type* to another.
 2. Derivation operates over one argument ‘slot’ per derivation, while allowing for multiple derivations.
 3. Compounds can be treated as equivalent to derivation (including both endocentric and exocentric compounds)

In our discussion (see Figures 1), we use the symbol ϕ to denote some morphological constructional template whose function is to change the type of the lexeme input to it to a specific type. This morphological constructional template takes another lexeme as an input argument. A lexeme is a morpheme that is semantically meaningful and is therefore encoded as a lexical entry using a morphologically relevant version of a logical structure and represented with qualia appropriately.

We discuss this qualia representation with respect to Irish in more detail in section 3.1. We generalise this morphological constructional template with its morphological logical structure, within a lexeme frame template, as:

$$(8) \quad [[\alpha_{\text{ArgLexeme}}] \oplus [\beta_{\text{Category_Lexeme}}]]\phi_{\text{type}}$$

The input argument lexeme ($[\alpha_{\text{ArgLexeme}}]$) may occur in a pre- or –post position, indeed any affix position, according to the language under study. The \oplus operator in the morphological constructional template in (8) represents morphological fusion of the α lexeme with the β lexeme yielding a lexeme with ϕ type. A general working assumption is that affixes that are not inflectional must be derivational. Derivational morphology is word formation that either results in a new word class or a new instance of the same word class. Affixes attach to roots or stems to form new words. Sometimes we may not see an *overt morpheme*, in which case we speak of a zero-derivation (9). Zero-derivation is a word-formation process that changes the lexical category of a word without changing its phonological shape. It may happen that,

over time, a word formed by a zero-derivation or other productive process becomes lexicalised.

It is well understood that, crosslinguistically, morphemes are applied over a fixed order in which the attachment order is significant. We present a generalised representation in (10) where the meaning of the whole within the set of derivations is determined by the meaning of its parts according to a principle of compositionality.

- | | | Adj | ➔ | Adv |
|------|----|------------------------------|---|-------------------------------------|
| (9) | a. | <i>crua</i> ‘hard’ (Adj) | ➔ | <i>go cruu</i> ‘hard’ (Adv) |
| | b. | <i>dona</i> ‘bad’ (Adj) | ➔ | <i>an dona</i> ‘very bad’ (Adv) |
| | b. | <i>tapaidh</i> ‘quick’ (Adj) | ➔ | <i>an tapaidh</i> ‘very quick (Adv) |
| (10) | a. | Derivation: | [prefix ₁ – [[[ROOT] –suffix ₁] –suffix ₂]] | |
| | b. | Inflection: | [prefix ₁ – [[[ROOT] –suffix ₁] –suffix ₂] –suffix ₃] | |

We present in Figure 2 a generalised view of the grammar and the lexicon, indicating the relationship between the lexeme store of morphemes with semantic meaning (i.e., lexemes), and the repertoire of morphemes that encode grammatical information within morphological inventory.

We view the morphological elements in the grammar, which are language specific, as having internal structure and divided into the areas of lexeme store (if they are conceptually meaningful) and the morpheme store (for those morphemes that provide grammatical function). Additionally, the lexemes have structured entries in the lexicon.

In Figure 1, we suggest an initial conceptualisation of the structural representation of the layered structure of the word. The morphological constituent projection in the layered structure of the word is important for derivation and the constituents here include the input argument lexeme and the type-changing lexeme. One category denoting lexeme (represented by ϕ) will determine the word type, irrespective of the lexeme input to the ‘slot’ in the morphological template.

The output of one derivation may be input to the next. The fact that speakers of the languages of the world add phonological material to either end of a word can lead to complex words and complex structures. We discuss some derivation processes of Irish next.

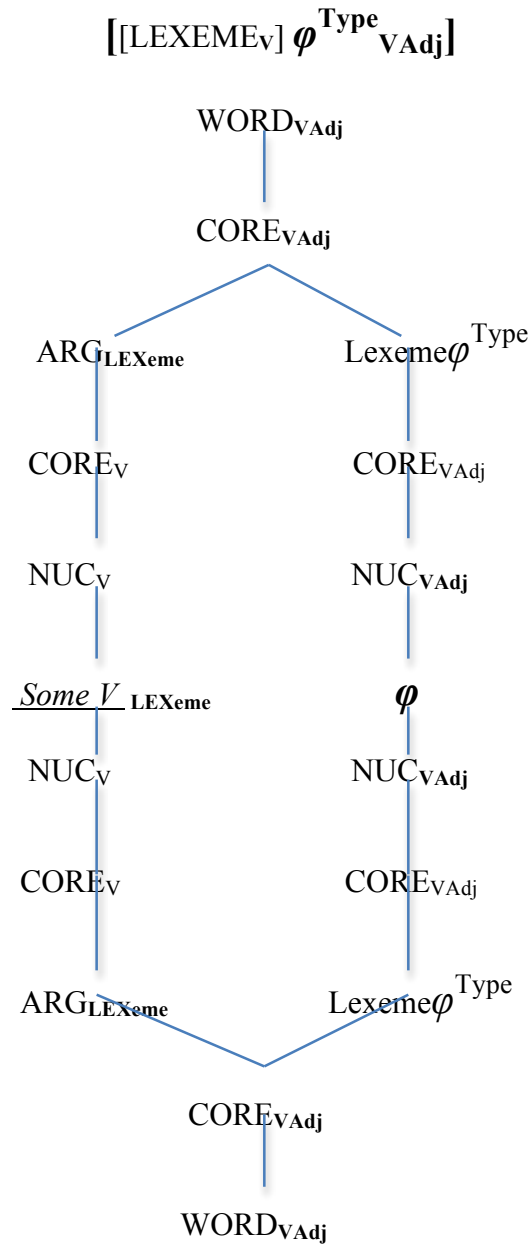


Figure 1: The RRG layered structure of the word in a derivation of $V \rightarrow V_{Adj}$

3.2 Derivation processes and adjectives

Languages have been reported to use different kinds of morphological strategies. In this section we examine the morphological strategies that Irish employs for deriving adjectives from lexical items belonging to other categories like nouns and verbs, and also from adjectives themselves. Adverbs too can also be derived from adjectives. Irish derivational processes (Nolan 2009) are regular and productive. In Irish we can find derivational processes involving the following strategies (11).

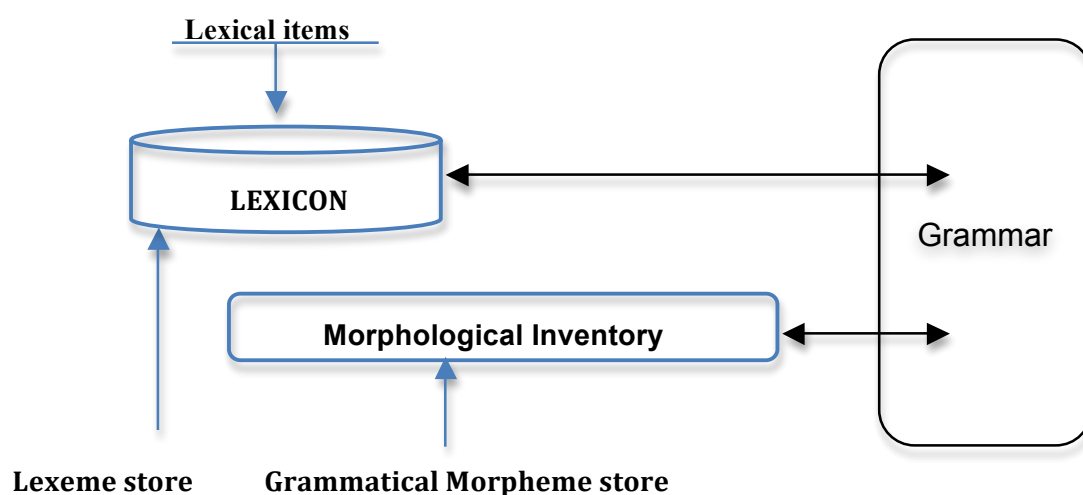


Figure 2: The morphological inventory and the lexicon in grammar

The lexeme template inventory for these in the lexeme store is indicated in (12). The type determining lexeme template schematically has the format of $[[\alpha] \oplus [\beta]]\phi_{\text{type}}$, where the input argument is denoted by α . We indicate how these lexemes morphologically fuse with an argument in a type changing derivation in (12), and we provide examples in the subsections following. As before, the \oplus operator represents the fusion within the derivation of lexeme representing some concept plus the category type to yield a specific output type of lexeme, the derived lexeme.

- | | | | | | | |
|------|----|-----|---|-----------------|---|--|
| (11) | a. | Adj | ← | intensifier+Adj | : | adjective plus intensifier prefix |
| | b. | VA | ← | V | : | verbal adjective |
| | c. | Adj | ← | Adj +Adj | : | adjective + adjective compound |
| | d. | N | ← | Adj +N | : | adjective + noun compound |
| | e. | Adv | ← | Adj | : | adverb |
| | | | | | | <u>Lexeme constructional template</u> |
| (12) | a. | Adj | ← | intensifier+Adj | : | $[\text{intensifier_}] \oplus [\text{Adj}]]\phi_{\text{Adj}}$ |
| | b. | VA | ← | V | : | $[[\text{V}] \oplus [\text{_suffix}]]\phi_{\text{VA}}$ |
| | c. | Adj | ← | Adj +Adj | : | $[[\text{Adj}] \oplus [\text{Adj}]]\phi_{\text{Adj}}$ |
| | d. | N | ← | Adj +N | : | $[[\text{Adj}] \oplus [\text{N}]]\phi_{\text{N}}$ |
| | e. | Adv | ← | Adj | : | $[[\text{Adj}] \oplus [\text{_}]]\phi_{\text{Adv}}$ |

3.3 Adjectives from intensifier + adjective derivation

An intensifier can prefix an adjective with the resulting form being another adjective. That is, the sortal type of adjective is retained on output from the derivation.

- | | | | | | |
|------|----|--|--|----|--|
| (13) | a. | <i>láidir</i>
strong: Adj
'Strong' | | b. | <i>ró-láidir</i>
too: Intensifier+strong: Adj
'Too strong' |
|------|----|--|--|----|--|

3.4 Adjectives from verbal derivation

Adjectives can be derived from verbs in several languages by changing the verbs into participles or verbal adjectives. We can see an example (14) of the perfective passive, and the schema of its syntactic pattern. We see an additional example of this in (15) where the (verbal) adjective, derived originally from a verb, is deployed in adjectival function.

(14) Perfective Passive

- a. *Bhí an leabhar leite agam.*
 Be:AuxV.past the book:N.m read.VA at:Prep+me.PN
 ‘The book was read by me.’ (Lit. ‘Be the book read at me’)
- b. Syntactic schema for perfective passive
 [AuxV NP_{undergoer} VA (ag_{Prep} NP_{actor}) ...]

- (15) *Thuit sneachta fríd an oidhche agus bhí sé curtha glan anois.*
Thuit sneachta₁ fríd an oidhche agus
 Fall:V.past snow:N.m through:ADV the:DET night:N.f and:CONJ
- bhí sé₁ curtha glan anois.*
 be:AuxV.past it:PN₁ spread:VA clean:Adj now:ADVtime
 Snow fell through the night and it was spread clean now.

Table 1 shows some of the verbal and verbal adjective forms.

3.5 Adjective from adjective + adjective compounding

Adjectives can compound with other adjectives where the resulting form is still an adjective.

- (16) a. *bán* ‘white’ + *dearg* ‘red’ → *bán-dearg* ‘pink’
 a’. Lexeme constructional template: [[Adj] ⊕ [Adj]]_{φ_{Adj}}
- b. *Chuir sí cóiriughadh úr-nuaidh ar an dreisiúr.*

Chuir sí cóiriughadh úr-nuaidh
 Put:V.past she:PN.f ornament:N.m fresh:Adj+new:Adj

ar an dreisiúr.
 on:Prep the:DET dresser:N
 She put a fresh ornament on the dresser.

3.6 Nouns derived from adjective + noun compounding

Adjectives can form compounds with nouns where the resulting form is a nominal (17) and (18). The function of qualifying a noun may be accomplished by either using an independent adjective with the noun or by forming an adjective-noun compound.

When the adjective is compounded with a noun, the adjective always appears as a prefix on the noun, according to the lexeme constructional template in (17).

(17) Lexeme constructional template: $[[Adj] \oplus [N]]\phi_N$

- (18) *Chuir eagna an tseanduíne cúl mór orm.*
Chuir eagna an tseanduíne cúl
 Put:V.past prudence:N.m the:DET old:Adj+person:N.m back:N.m
mór orm.
 large:Adj on:Prep+me:PN
 LIT: 'The prudence of the old person put huge reserves on me'.
 The old folk's prudence made me very resourceful.

Basic verb	Verb meaning	Verbal adjectives	VA Gloss
<i>ól</i>	drink	<i>ólta</i>	drunk
<i>dún</i>	close	<i>dunta</i>	closed
<i>las</i>	light	<i>lasta</i>	lit
<i>croch</i>	hang	<i>crochta</i>	hung
<i>stad</i>	stop	<i>stadta</i>	stopped
<i>buail</i>	hit	<i>buailte</i>	beaten
<i>sín</i>	stretch	<i>sínte</i>	stretched
<i>bris</i>	break	<i>briste</i>	broken
<i>goid</i>	steal	<i>goidte</i>	stolen
<i>ite</i>	eat	<i>ite</i>	eaten
<i>rith</i>	run	<i>rite</i>	run
<i>caith</i>	spend	<i>caite</i>	spent
<i>bog</i>	move	<i>boghta</i>	moved
<i>ceap</i>	catch	<i>ceapta</i>	caught
<i>fág</i>	leave	<i>fágtha</i>	left
<i>léim</i>	jump	<i>léimthe</i>	jumped
<i>beir</i>	catch	<i>beirthe</i>	caught
<i>lig</i>	let	<i>lighte</i>	let
<i>aithraigh</i>	change	<i>aithraite</i>	changed
<i>ceannaigh</i>	buy	<i>ceannaithe</i>	bought
<i>coinnigh</i>	keep	<i>coinnithe</i>	kept
<i>imigh</i>	go	<i>imithe</i>	gone

Table 1. Some verbal adjectives with lexeme construction template: $[[V] \oplus [\text{suffix}]]\phi_{VA}$

3.7 Adverbs derived from adjectives

Adjectives lose some of their prototypical characteristics when used as adverbs. Adjectives in Irish may be used as adverbs without modification but their connotation changes (19) in that adjectives indicate a permanent or normal state whereas, when used as adverbials in functions in relation to a verb, or to denote the manner of some action, they indicate a temporary or abnormal state. Some adverbs have the same form as adjectives when used in an adverbial function. We illustrate in (20) the composition of the lexeme constructional templates for the adverbs in (19).

- (19) a. *Tá sé ag obair [go crua].*
 Be.AuxV.pres he:PN.3sg.m at:PP work:VN [to:PP hard:Adj]Adv
 'He is working hard.'
- b. *Bhí sí saidhbhir go deo.*
 Be.AuxV.past she:PN.3sg.f rich:Adj [to:Prep ever:Adj]Adv
 She was always rich.
- c. *Chodhail mé cuiosach maith.*
 Sleep:V.past I:PN.1sg [fairly:Adv well:Adj]Adv
 I slept fairly well.
- (20) Lexeme constructional template: a. $[[PP] \oplus [Adj]]\phi_{Adv}$
 Lexeme constructional template: b. $[[PP] \oplus [Adj]]\phi_{Adv}$
 Lexeme constructional template: c. $[[Adv] \oplus [Adj]]\phi_{Adv}$

3.8 Motivating the semantics of lexemes

The semantics of derived lexemes is an issue of interest to morphology. One approach to dealing with complex issues (such as, for example, over-extension, under-extension, polysemy and homophony) in the context of the morphology-semantics interface is given in Pustejovsky (1995) and Van Valin (2005). Pustejovsky (1995) proposes an account of nouns in the lexicon in terms of qualia theory. The headings under which Pustejovsky attempts to capture the attributes of nominals are: constitutive, formal, telic, and agentive. The manner in which they relate together is indicated in (21).

- (21) Qualia theory
- a. Constitutive role Q_C : The relation between an object and its constituents, or proper parts.
1. Material
 2. Weight
 3. Parts and components
- b. Formal role Q_F : That which distinguishes the object within a larger domain
1. Orientation
 2. Magnitude
 3. Shape
 4. Dimensionality
 5. Colour
 6. Position
- c. Telic role Q_T : Purpose and function of the object
1. Purpose that an agent has in performing an act
 2. Built-in function or aim that specifies certain activities
- d. Agentive role Q_A : Factors involved in the origin or "bringing about" of an object
1. Creator
 2. Artefact
 3. Natural kind
 4. Causal chain

We might remember at this point that a ‘word’ is a morpheme that is in the lexicon, a lexeme with semantic meaning, which will be expressed as a word in syntax. In contrast, an inflectional morpheme of grammatical consequence and relevance to syntax is a simple morpheme in the morpheme store in the morphological inventory.

- (22) a. ‘The door opened’.
b. BECOME **be**’(open’(the door(x), {Q_C, Q_F, Q_T, Q_A}))

- (23) a. **Persons:** baker, dancer, gambler, driver
b. **Animals:** pointer, retriever
c. **Material objects:** blotter, eraser, fertilizer, shutter
d. **Immaterial objects:** reminder, thriller, eye-opener
where: a: denotes a type of actor
b: denotes a type of creature
c: denotes a type of material entity in the lexicon
d: denotes a type of immaterial entity in the lexicon

All of these have their respective underlying lexemes and descriptive qualia as represented in a lexicon entry. We can also note the different event types involved in the verb creation by the English agentive suffix ‘-er’. In RRG, we represent the event types using various aktionsarten types (24).

- (24) Aktionsarten Types

Verb Class	Logical Structure
State	predicate ’ (x) or (x, y)
Activity	do ’ (x, [predicate (x) or (x, y)])
Achievement	INGR predicate ’ (x) or (x, y)
Accomplishment	BECOME predicate ’ (x) or (x, y)

The Irish data is quite different (25) with respect to variation across the agentive suffix. To illustrate these differences, we take similar categories of person, animal, and objects, where ‘a’ denotes a type of actor, ‘b’ denotes a type of creature, ‘c’ denotes a type of material entity in the lexicon, and ‘d’ denotes a type of immaterial entity in the lexicon.

Immediately we can see the variation across the agentive suffices. This variation is in virtue of the declension class membership of the respective Ns and their morphological gender. We can intuitively state the behaviour of the English agentive suffix, ‘-er’, as a rule (26).

Indications of the rules and their important distinctions for Irish are provided in (27). The logical structure of a clause that uses the *bacáil* ‘bake’ verb is given in (28), and *báicéir* ‘baker’ then elaborates the x argument. The logical structures operate according to the Actor-Undergoer Hierarchy, indicated in (29).

(25) a. Persons:	<i>Bolscaire</i> ‘announcer’	__ <i>aire</i> is suffix
	<i>Spásaire</i> ‘astronaut’	__ <i>aire</i>
	<i>Fuascailteoir</i> ‘liberator’	__ <i>oir</i>
	<i>Léachtóir</i> ‘lecturer’	__ <i>óir</i>
b. Animals:	<i>Báicéir</i> ‘baker’	__ <i>éir</i>
	<i>Rinceoir</i> ‘dancer’	__ <i>oir</i>
	<i>Damhsóir</i> ‘dancer’	__ <i>óir</i>
	<i>Cearrbhach</i> ‘gambler’	__ <i>ach</i>
c. Material objects	<i>Tiománaí</i> ‘driver’	__ <i>aí</i>
	<i>Treoir</i> ‘pointer’	__ <i>oir</i>
	<i>Snáthaid</i> ‘pointer’	__ <i>aid</i>
	<i>Gadhar</i> ‘retriever’	__ <i>ar</i>
d. Immaterial objects	<i>páipear suite</i> ‘blotter’	Phrase, no suffix
	<i>scriosán</i> ‘eraser’	__ <i>án</i>
	<i>leasachán</i> ‘fertilizer’	__ <i>án</i>
	<i>comhla</i> ‘shutter’	__ <i>a</i>
	<i>Cuimhneachán</i> ‘reminder’	__ <i>án</i>
	<i>Scéinséir</i> ‘thriller’	__ <i>éir</i>
	<i>oscailt súl</i> ‘eye-opener’	Phrase, no suffix

- (26) **Rule:** V of category type + English suffix ‘-er’
→ Agentive N to do with action of V
Which represents ‘*somebody or something whose function or characteristic is to perform a particular act*’.

The rule in (26), for English, can be contrasted with the more complex and detailed rule (27) for Irish, where different distinctions are made.

- (27) a. **Rule:** V of category type + Irish suffix set ‘-{*aire|eoir|óir|éir|oir|ach|aí|...*}’
→ Agentive N [+anim, +human] to do with action of V
Which represents: ‘*some person whose function or characteristic is to perform a particular act*’.
- b. **Rule:** V of category type + Irish suffix set ‘-{*oir|id|ar|...*}’
→ Agentive N [+anim, -human] to do with action of V
Which represents: ‘*some creature whose function or characteristic is to perform a particular act*’.
- c. **Rule:** V of category type + Irish suffix set ‘-{*án|a|éir|...*}’
→ Agentive N [-anim, -human] to do with action of V
Which represents: ‘*some thing whose function or characteristic is to perform a particular act*’.

(28) **Semantic Logical Structure**

bacáil ‘bake’ V.past

[**do**’(ACT: x, 0)] CAUSE [BECOME **baked** (UND: y)]

(29) **The Actor-Undergoer Hierarchy (Van Valin and LaPolla 1997)**

The Actor-Undergoer Hierarchy				
Actor		Undergoer		
Argument of DO	1 st Argument of do' (x...	1 st argument of pred' (x, y)	2 nd argument of pred' (x, y)	Argument of state pred' (x)
Agent	Effector	Location	Theme	Patient
	Mover	Perceiver	Stimulus	Entity
	Emitter	Cogniser	Content	
	Performer	Wanter	Desire	
	Consumer	Judger	Judgement	
	Creator	Possessor	Possessed	
	Speaker	Experiencer	Sensation	
	Observer	Emoter	Target	
	User	Attributant	Attribute	
			Performance	
			Consumed	
			Creation	
			Locus	
			Implement	

When lexemes combine to form a derivation, for example, involving type coercion then the lexemes combine according to the particular morphological constructional schemata found in the lexeme store in the lexicon. These morphological constructional schemata, we posit, are in the lexeme inventory within the lexicon, with a morphologically relevant logical structure as shown in (30), schematically. For an instance where an actor N is formed as one who does the action of a specific V, we have the following in (31), based on the constructional schema in (30). We suggest that qualia theory might usefully be extended into, and be motivated by, a language-oriented conceptual ontology with a deep grain size of appropriate relevance to human language.

(30) Lexeme constructional schema
 $[[\varphi\alpha_{\text{Arg_Lexeme}}] \oplus [\varphi\beta_{\text{Lexeme}}]]\varphi_{\text{type}}$

- (31) a. $[[\alpha:V] \oplus [_éir]]\varphi_{\text{type:N}} \rightarrow \varpi:\varphi$, representing some agentive word of type N and meaning ‘doer of V’
- b. $[[bácúil:V] \oplus [_éir]]\varphi_{\text{type:N}} \rightarrow bácéir$ ‘baker’ (N.sg)
- c. $[[scriobh:V] \oplus [_éoir]]\varphi_{\text{type:N}} \rightarrow scríbhneoir$ ‘writer’ (N.sg)

The frame-based lexeme templates and lexemes constructional schemata proposed within the lexeme store part of the lexicon for derivational lexemes is intended to be compatible with this use of an ontology. An input argument lexeme, employed in derivation within a morphological constructional template, will have a fully generalised specification in qualia theory terms.

4. Discussion

We have outlined some considerations applicable to a characterisation of an derivational morphology of the Irish word, situated within an RRG layered structure of the word (LSW), that is compatible with the layered structure of the noun phrase and the layered structure of the clause. We considered derivation within an account that we discussed examples of how a new lexical category was formed, or how the lexical meaning was modified in some way, within the LSW in RRG. We have indicated in our conceptualisation of the layered structure of the word and how it would cater for derivation. We discussed the need for an inventory of morphemes, similar to the syntactic inventory.

We claim that lexemes are to be found within the lexicon, in a lexeme store, and formulated as concepts connected to qualia theory (see also the related work on a linguistic conceptual ontologies and Lexical Constructional templates of Mairal and Ruiz de Mendoza (2008, 2009)). In contrast to lexemes, morphemes will be stored as part of a language specific morpheme inventory.

We have looked at the idea of a lexeme store and a morphological inventory for morphemes, and proposed a layered structure of the word for Irish, for derivation. We have also motivated a lexeme constructional template, that is, a frame-based entry in the relevant part of the lexeme store in the lexicon, and illustrated derivation type changing processes via a collection of generalised morphological constructional schemata for lexemes. We have shown, for the layered structure of the word, how derivation relates a lexeme to another lexeme. We represented lexemes as frame-based morphological constructions with their own inherent logical form, classified by type, where the types are assumed to inherit generalised properties in the lexicon. We provided considerable examples of Irish data to support our discussion of the layer structure of the word in respect of morphological derivation within RRG.

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UniArab: An RRG Arabic-to-English machine translation software

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Abstract

This paper presents a machine translation system (Hutchins 2003) called UniArab (Salem, Hensman and Nolan 2008). It is a proof-of-concept system supporting the fundamental aspects of Arabic, such as the parts of speech, agreement and tenses. UniArab is based on the linking algorithm of RRG (syntax to semantics and vice versa). UniArab takes MSA Arabic as input in the native orthography, parses the sentence(s) into a logical meta-representation based on the fully expanded RRG logical structures and, using this, generates perfectly grammatical English output with full agreement and morphological resolution. UniArab utilizes an XML-based implementation of elements of the Role and Reference Grammar theory in software. In order to analyse Arabic by computer we first extract the lexical properties of the Arabic words (Al-Sughaiyer and Al-Kharashi 2004). From the parse, it then creates a computer-based representation for the logical structure of the Arabic sentence(s). We use the RRG theory to motivate the computational implementation of the architecture of the lexicon in software. We also implement in software the RRG bidirectional linking system to build the parse and generate functions between the syntax-semantic interfaces. Through seven input phases, including the morphological and syntactic unpacking, UniArab extracts the logical structure of an Arabic sentence. Using the XML-based metadata representing the RRG logical structure, UniArab then accurately generates an equivalent grammatical sentence in the target language through four output phases. We discuss the technologies used to support its development and also the user interface that allows for the addition of lexical items directly to the lexicon in real time. The UniArab system has been tested and evaluated generating equivalent grammatical sentences, in English, via the logical structure of Arabic sentences, based on MSA Arabic input with very significant and accurate results (Izwaini 2006). At present we are working to greatly extend the coverage by the addition of more verbs to the lexicon. We have demonstrated in this research that RRG is a viable linguistic model for building accurate rule-based semantically oriented machine translation software. Role and Reference Grammar (RRG) is a functional theory of grammar that posits a direct mapping between the semantic representation of a sentence and its syntactic representation. The theory allows a sentence in a specific language to be described in terms of its logical structure and grammatical procedures. RRG creates a linking relationship between syntax and semantics, and can account for how semantic representations are mapped into syntactic representations. We claim that RRG is very suitable for machine translation of Arabic, notwithstanding well-documented difficulties found within Arabic MT (Izwaini, S. 2006), and that RRG can be implemented in software as the rule-based kernel of an Interlingua bridge MT engine. The version of Arabic (Ryding 2005, Alosch 2005, Schulz 2005), we consider in this paper is Modern Standard Arabic (MSA), which is distinct from classical Arabic. In the Arabic linguistic tradition there is not a clear-cut, well defined analysis of the inventory of parts of speech in Arabic.

Keywords: Arabic Machine Translation, Role and Reference Grammar, RRG, Java programming, XML

1 Introduction

This paper reports on recent work the development of a rule-based semantically oriented Interlingua bridge framework for machine translation of Arabic language processing using the Role and Reference Grammar (RRG) linguistic model. Machine translation is a sub-field of computational linguistics that investigates the use of computer software to translate text (or speech) from one natural language to another. Our system has been developed and is able to analyse Arabic sentences in native orthography, and extract their logical structure. Through a detailed study of the Arabic language, we have been able to develop an analyser that can successfully process many of the unique features and challenges present in Arabic. This logical structure is then used in the generation phase, where the sentence(s) is translated into another language, in this case, English.

The Arabic language is written from right to left, it has complex, language-specific grammar rules, and a relatively free word order. These distinguishing features pose a major challenge in processing Arabic text for linguistic analysis. Our framework demonstrates that RRG is a feasible foundation for building multi-language machine translations systems. Arabic is a Semitic language originating in the area presently known as the Arabian Peninsula. The Arabic language is one of six major world languages, and one of the six official languages of the United Nations. The version of Arabic we consider in this work is Modern Standard Arabic (MSA). When we mention Arabic throughout this paper we mean MSA, which is a distinct, modernized form of Classical Arabic (Alosh 2005). MSA is the universal written language of the Arabic-speaking population, printed in most books, newspapers, magazines, official documents, and reading primers for children. Most of the oral Arabic spoken today is more divergent than the written Arabic language, because of dialectal interference. However MSA is the literary and standard variety of Arabic used in writing and formal speeches today (Schulz 2005).

In this paper we discuss the RRG UniArab MT research project and the Interlingua model of Arabic MT that we designed and built using Java and XML. With this we discuss the challenges inherent within Arabic MT and the part that RRG played in helping to overcome many of the challenges. The architecture of the lexicon and its design and implementation in XML is discussed, along with a presentation of the results produced by the UniArab software evaluation

2 The Role and Reference Grammar (RRG) Linguistic Model

Role and Reference Grammar (RRG) is a model of grammar that posits a direct mapping between the semantic representation of a sentence and its syntactic representation (Van Valin 2005). We claim that RRG is very suitable for machine translation of Arabic via an Interlingua bridge implementation model. RRG is a mono strata-theory, positing only one level of syntactic representation, the actual form of the sentence and its linking algorithm can work in both directions from syntactic representation to semantic representation, or vice versa. In RRG, semantic decomposition of predicates and their semantic argument structures are represented as logical structures. The lexicon in RRG takes the position that lexical entries for verbs should contain unique information only, with as much information as possible derived from general lexical rules.

The main features of RRG are the use of lexical decomposition, based upon predicate semantics, an analysis of clause structure and the use of a set of thematic roles organized into a hierarchy in which the highest-ranking roles are ‘Actor’ (for the most active participant) and ‘Undergoer’ (Van Valin 2005). RRG characterises the relationship between syntax and semantics and can account for how semantic representations are mapped into syntactic representations. RRG also accounts for the very different process of mapping syntactic representations to semantic representations. Of the two directions, syntactic representation to semantic representation is the more difficult since it involves interpreting the morphosyntactic form of a sentence and inferring the semantic functions of the sentence from it. Accordingly, we have chosen to implement Arabic to English as the translation direction and the basis of the parse and generate functions in this version of our software.

3 Interlingua approach of Arabic MT

The Interlingua approach is to develop a universal language-representation for text. In effect, in an Interlingua there is no transfer map, and the MT model thus has two main stages: input-PARSE-analysis and output-GENERATE.

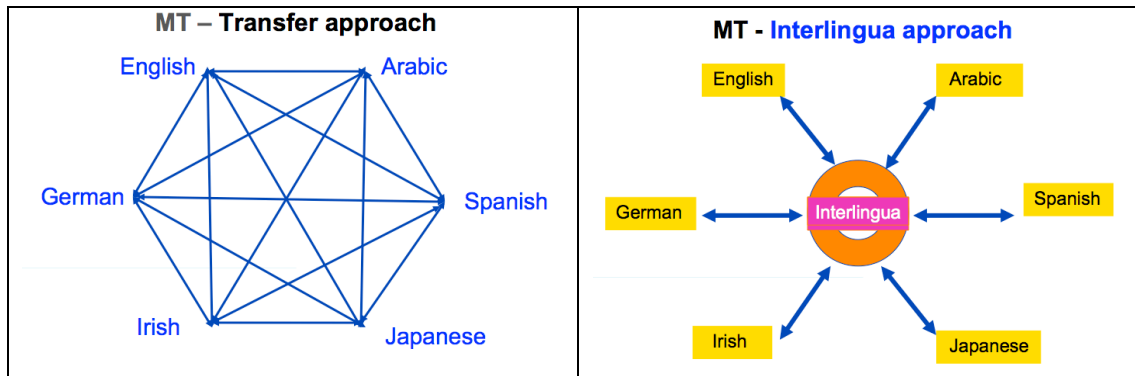


Figure 1: MT – Transfer vs. Interlingua approach

Interlingua-based MT is done via an intermediate semantic representation, based on RRG logical structures, of the source language text. An Interlingua is designed to be a language independent representation from which translations can be generated to different target languages.

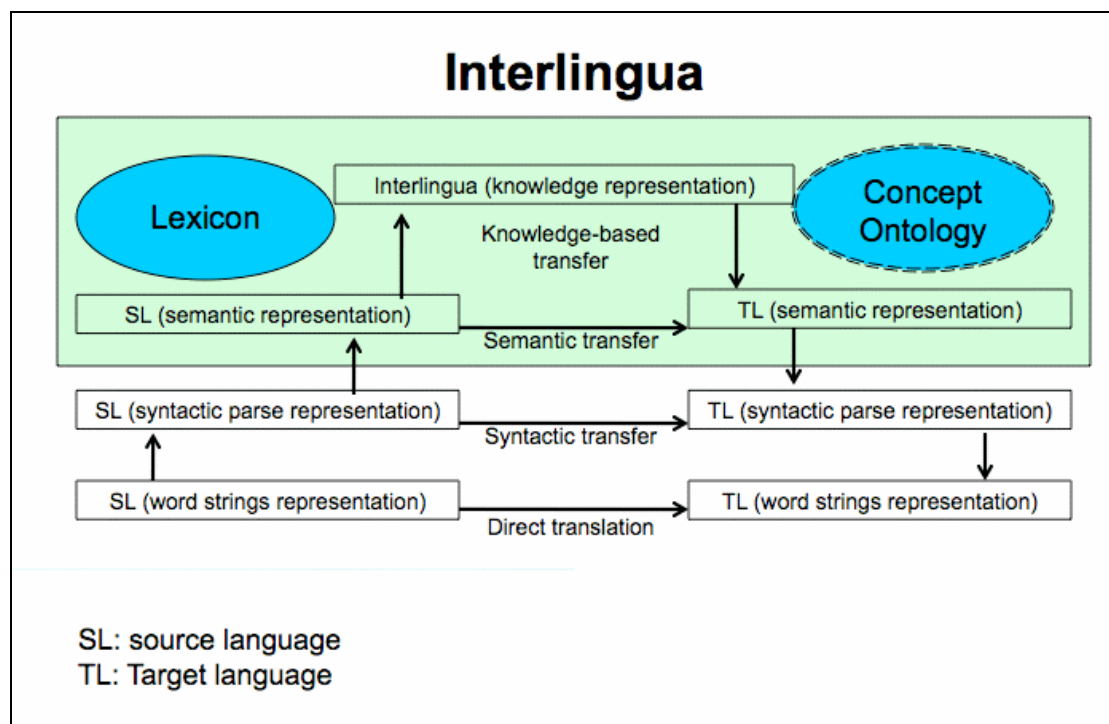


Figure 2: MT – Our Interlingua approach

3.1 UniArab: Lexical representation in an Interlingua system

Transfer oriented translation systems (Figure 1) do not scale up when additional languages are added beyond the initial source (SL1) and target (TL1) language pairs, and very quickly this leads to a translation complexity problem between languages. Additionally, of course, in simple transfer-based systems there are no problems if, for

a particular language pair, there are morphosyntactic one-to-one equivalents; problems do arise, however, when there is more than one target word for a single source word.

Implementation of an Interlingua bridge architecture solves (Figure 2) the translation complexity problem as automatic language translation is made from a source language into a kernel meta representation (the input PARSE phase) and generates to a target language from the meta representation (the GENERATION phase). Ambiguity problems for an Interlingua in a multilingual system are still likely if one of the languages involved has two or more potential forms for a single given word in one of the other languages. A semantically oriented approach to MT can potentially disambiguate more easily than other strategies. For an Interlingua to be completely language-neutral, it must represent not the words of one or another of the languages, but language-independent lexical units. Any distinction that can be expressed lexically in the languages of the system must be represented explicitly in the Interlingua representation (Hutchins 2003). We use the RRG logical structures as the basis of our meta-representation in the Interlingua Bridge with a lexicon encoded in XML.

The UniArab system can generate a target language through classifying every Arabic word in the input source text by creating a meta-representation of the sentence(s) input as a text in a fully populated RRG-style logical structure including its various nominals and their associated features of [def+, masc+], etc.. There are six major parts of speech in Arabic. These are verbs, nouns, adjectives, proper nouns, demonstratives, adverbs and we create a seventh for purposes of our software, which we have simply called the 'other' category for Arabic words that do not fit into any of previous six categories. The major parts of speech in the Arabic language have their own attributes, and we use these attributes within the UniArab system. For example, verbs in the Arabic language agree with their subjects in gender. Arabic words are masculine and feminine; there is no neutral gender. In the UniArab system we record the gender associated with a verb in the syntax for a particular subject NP. Adjectives and demonstratives also agree with the subject in gender too. In Arabic, words come into three categories with regards to number. They are:

- (1) *Singular*, indicating one
- (2) *Dual*, indicating two
- (3) *Plural*, indicating three or more.

The UniArab system records these attributes of gender and number. It is important to understand that source language specific features may not be used, or may be significantly different, in the target language. For example, the Arabic number category of *dual* is not relevant in English. The UniArab system is directly based on RRG and uses logical structures for each verb in the lexicon.

3.2 Challenges of Arabic to English MT

Arabic words can often be ambiguous due to the three-letter root system. Most words are derived from a three-letter root that is modified to create the different derivations. In some morphological derivations one or more of the root letters is dropped, resulting in possible ambiguity. Arabic has a large set of morphological features (Al-Sughaiyer and Al-Kharashi 2004). These features are normally in the form of prefixes

or suffixes that can completely change the meaning of the word (see Figures 3 and 4). This means an MT may need to apply a thorough analysis in order to obtain the root or to deduce that in one ‘word’ there is in fact a full sentential proposition.

- **Root:** a relatively invariable discontinuous bound morpheme, typically three consonants in a certain order, which interlocks with a pattern to form a stem and which has **lexical** meaning.
- **Pattern:** a bound (maybe discontinuous) morpheme consisting of one or more vowels and slots for root phonemes, which either alone or in combination with one to three derivational **affixes**, interlocks with a root to form a stem, and which generally has **grammatical meaning**.
- **Patterns** signify grammatical or language-internal information, distinguishing word types and classes.
- These patterns can differentiate between nouns, verbs and adjectives.

Arabic	Example	POS
كَتَبَ <i>kataba</i>	he wrote	verb
كَاتَبَ <i>kātaba</i>	he corresponded	verb
كُتِبَ <i>kutiba</i>	it was written	verb
كِتَابَ <i>kīāb</i>	book	noun
كُتُبَ <i>kutub</i>	books	noun
كَاتِبَ <i>kātib</i>	writer; (adj) writing	noun
كُتَّابَ <i>kutāb</i>	writers	noun
مَكْتَبَ <i>maktab</i>	desk; office	noun
مَكَاتِبَ <i>makātib</i>	desks; offices	noun
مَكْتَبَةَ <i>maktabah</i>	library	noun

root: k.t.b. + pattern: a.a.a → kataba
.C.C.C. V.V.V

Figure 3: The root and pattern characteristics of Arabic

- The **root and pattern word formation** patterns in the Semitic languages have been treated by segmenting morphemes on different auto-segmental ‘tiers’ or ‘planes’ (cf. McCarthy 1982).
- Tri-consonantal **roots** which bear the basic lexical meaning of the verb occupy one tier while vocalic melodies (the **pattern**) occupy a separate tier.
- The two tiers are organised by association with a ‘template’ or ‘skeleton’ consisting of syllables of prosodic structure within words.

Figure 4: The tri-consonantal roots and word formation in Arabic

Arabic has a relatively free word order (Figure 5) and this poses a significant challenge to MT due to the vast possibilities to express the same sentence in Arabic. For the elements of subject (S), verb (V) and object (O), Arabic's relatively free word order allows the combinations of SVO, VSO, VOS and OVS. For example, consider the following word orders: (1) V N N and (2) N V N. This means that we have a challenge to identify exactly which are the **subject** and the object. An example of the RRG layered structure of the Arabic clause is presented in Figure 6.

- ▶ Arabic has **free word order**:

▶ **Verb** Noun Noun

▶ Noun **Verb** Noun

Brian rides the bus.	براين يركب الحافلة <i>brāyn yrkb ālhāflh</i>
Brian rides the bus.	الْحافِلَة يَرْكَبُ براين <i>yrkb brāyn alhāflh</i>

- ▶ Arabic has SVO, VSO, VOS and OVS orders in sentences.

- ▶ No copula verb in Arabic; 'to be' or 'to have'

I am Irish.	أنا أيرلندي <i>anā āyrlndy</i>
we are students.	نحن تلاميذ <i>nḥn tlāmyd</i>
he is an engineer.	هو مهندس <i>hw mhnds</i>

Figure 5: The challenges of Arabic for MT

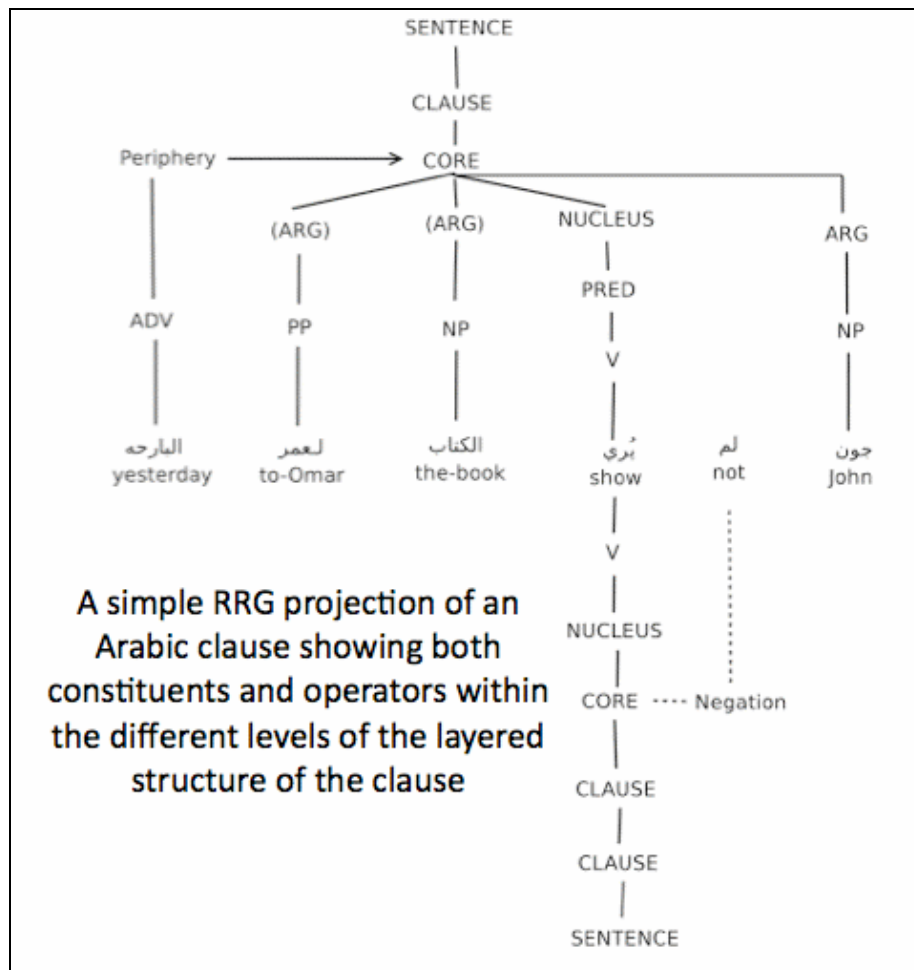


Figure 6: The layered structure of the Arabic clause

4 The UniArab System

UniArab is a proof-of-concept system supporting the fundamental aspects of Arabic, such as the parts of speech, agreement and tenses. UniArab stands for Universal Arabic machine translator system. UniArab is based on the linking algorithm of RRG (syntax to semantics and vice versa). The conceptual structure of the UniArab system is shown in Figure 7. The system accepts Arabic as its source language. The morphology parser and word tokenizer have a connection to the lexicon, which holds all attributes of a word. UniArab was developed in the Java programming language with the lexicon encoded in XML.

UniArab stores all data in XML format. This data can then be queried, exported and serialized into any format the developer wishes. The system can understand the part of speech of a word, agreement features, number, gender and the word type. The syntactic parse unpacks the agreement features between elements of the Arabic sentence into a semantic representation (the logical structure) with the 'state of affairs' of the sentence. In UniArab we have a strong analysis system that can extract all attributes from the words in a sentence.

The structure of the UniArab system in Figure 7 breaks down into the several phases, which are described following.

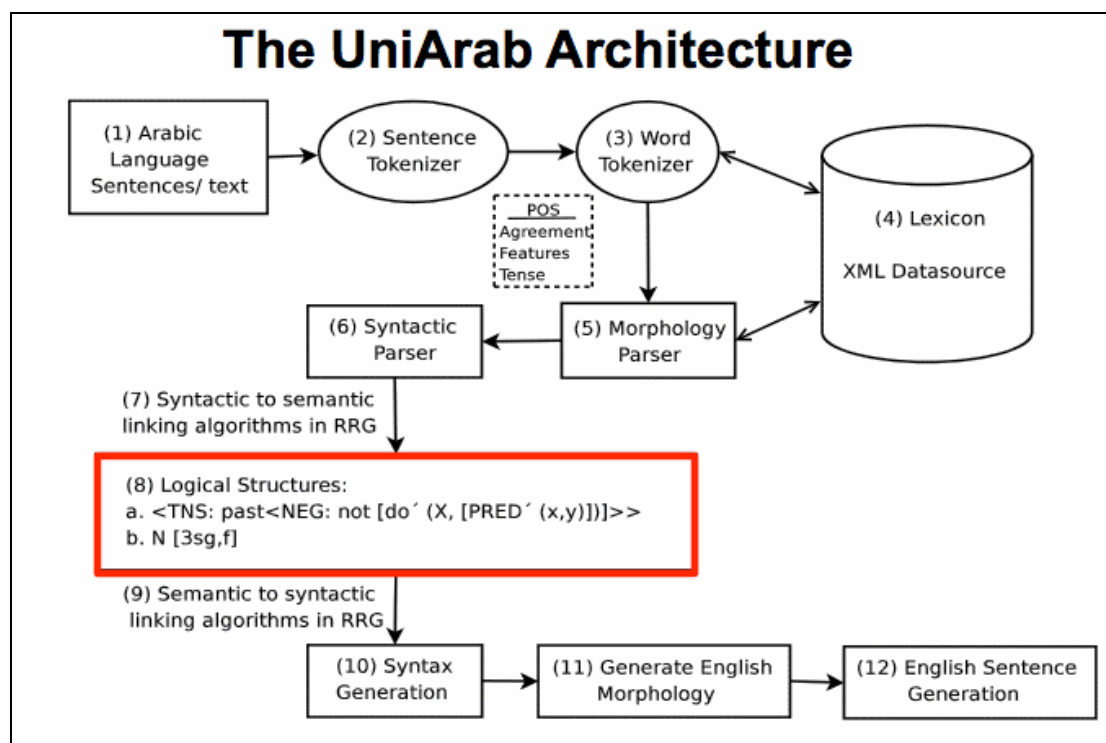


Figure 7: The conceptual architecture of the UniArab system

Phase (1) Input of Arabic language sentence: The input to the system consists of one or more sentences in Arabic.

Phase (2) Sentence Tokenizer: Tokenization is the process of demarcating and classifying sections of a string of input characters. In this phase the system splits the

text into sentence *tokens*. The resulting tokens are then passed to the word tokenizer phase.

Phase (3) Word Tokenizer: In this phase sentences are split into tokens. For example, for the Arabic sentence (4a), read from right to left, the output (4b) of phase 3 is as follows.

- (4) a. qr'a ḥāld ālktāb '*Khalid read the book*'.
 b.

```
<sentence>
      <word$> qr'a </word>
      <word$> ḥāld</word>
      <word$> ālktāb </word>
    </sentence>
```

Phase (4) Lexicon XML Data-source: A set of XML documents for each component category of Arabic. More details will be in sections 6 and 7.

Phase (5) Morphology Parser: Directly works with both the Lexicon and Tokenizer to produce the word order. A connection is made to the data-source of phase 4, which has been implemented as a set of XML documents. The use of XML has the added advantage of portability. UniArab will effectively work the same regardless of the operating system. To understand the morphology of each word, we first tokenize each sentence and determine the word relationships. Phase 5 of the system holds all attributes specific to each word of the source sentence.

Phase (6) Syntactic Parser: Determines the precise phrasal structure and category of the Arabic sentence. At this point, the types and attributes of all words in the sentence are known.

Phase (7) Syntactic linking (RRG) We must first develop the link from syntax to semantics out of the phrasal structure created in Phase 6, if we are to create a logical structure that will generate a target language and also act as the link in the opposite direction from semantics to syntax. The system should answer the main question in this phase, **who does what?** In this case the actor is *Khalid* and the undergoer is *the book*, as in (4) above.

Phase (8) Logical Structure: The creation of logical structure is the most crucial phase. An accurate representation of the logical structure of an Arabic sentence is the primary strength of UniArab. The results of the parse can be seen in the following logical structure for the verb 'read'

- (5) a. <TNS:PAST[do'(x,[read'(x,(y))])]>
 b. Verb 'read': sg 3rd.m PAST qr'a
 where :the Proper Noun is: *Khalid* sg unspec.m: ḥāld
 and the Noun is: *the book* sg def.m: ālktāb.

We also have the challenge of inferring the indefinite article, from the information unpacked in phase (5) and phase (6), as this does not exist in Arabic. All of the unique information for each word can thus be taken from the lexicon to aid in the creation of

a logical structure of the target language.

Phase (9) Semantic to Syntax: Assuming we have an input and have produced a structured syntactic representation of it, the grammar can map this structure from a semantic representation. In this phase the system uses a linking algorithm provided by RRG, to determine actor and undergoer assignments, assign the core arguments and assign the predicate in the nucleus. We determine the grammatical subject by analysing the agreement marking on the verb and the various nominals. The system uses the semantic arguments of logical structures.

Phase (10) Syntax Generation: The generation phase from the Interlingua Bridge meta-representation to the morphosyntax of a particular target language will, of course, depend on the characteristics of the target language. In our proof-of-concept software, we generate to grammatically correct English (see also phases 11 and 12, below). The generation phase implements the RRG semantics-to-syntax linking system.

Phase (11) Generate English Morphology: The system generates English morphology in an innovative way, generating the tenses that are not existent in Arabic but which do exist in English as well as the copula verb of ‘to be’ correctly, as appropriate. Our solution is to recognize the difference between morphological features and syntactic functional categories. The tense features must be determined analytically, and expressed correctly for the target language, in this instance, English.

Phase (12) English Sentence Generation: The process of generating an English sentence can be as simple as keeping a list of rules and these rules can be extended through the life of the MT system. The system will apply some operations in English such as vowel change in the lexical item of English to denote sg vs. pl, for example, *man* vs. *men*. Sometimes this accompanies affixations: *break/broke/broken* (=broke+en) to denote various tense and aspect distinctions.

Having described the various Interlingua phases, we now discuss in more detail, in the next section, the GENERATION from meta-representation (i.e., the logical structure) to target language.

5 UniArab - Generation

The target language generation phases in the UniArab system follow the syntactic realization model. Generation takes as input, the universal logical structure of the input sentence(s) and produces, as output, the grammatically correct morphosyntax of the target language. The UniArab system is a universal machine translator, which means that it can translate Arabic into any other natural language. The UniArab system is evaluated using Arabic as source language into English as the target language.

In the UniArab system phases 9, 10, 11 and 12 are for generation of the target languages, in our case this is English. First, the *Semantic to Syntactic* phase determines the actor and undergoer assignments, assigns the core arguments and assigns the predicate in the nucleus. The system uses semantic arguments of logical structure. In the UniArab system we keep all word attributes whether they are used in the target language or not. In this case, the gender of the noun *the book*, in Arabic is

masculine, but in English *book* has neutral gender. In Phase 10, *Syntax Generation*, and Phase 11, *Generate English Morphology*, UniArab uses target language rules to generate the syntax. The verb's logical structure indicates to UniArab how many arguments the verb takes. For example, the logical structure will be as in (6a), from the lexicon. Now the UniArab system replaces *x* with *Khalid*, and *y* with *the book*, after which it now holds the following (6b):

- (6) a. **Read:** [do'(x, [read'(x, (y))])]
 b. **Read:** [do'(Khalid, [read'(Khalid, the book)])]

In the last phase, *English Sentence Generation*, the UniArab system builds the final shape of a sentence: *Khalid read the book*. Moreover, there are some special cases, like the UniArab system adding the copula verb 'to be' into the English copula sentence, or changing the source language verb's tense to an appropriate and grammatically correct tense in the target language, depending on the tense distinction in the target language. Also, the word order in the target language must be considered and applied correctly.

6 An XML-based lexicon

In order to build this system and represent the data sources, we use the Java with the XML language (Bray et al., 2008). XML has become the default standard for data exchange among heterogeneous data sources (Arciniegas, 2000). The UniArab system allows data to be stored in XML format. This data can then be queried, exported and serialized into any format the developer wishes. We choose to create our data source as XML, for optimum support on different platforms. It was also easier as we used Arabic letters, not Unicode, inside the data source, and XML fully supports Arabic. We created our search engine for the lexicon using Java. The lexicon is represented as an XML data object

6.1 Advantages of XML

XML gives us a generalized way to store data, which is not married to any particular technology. This makes it easy to store information, and retrieve and manage it later, as required. Using XML to manage information offers a number of advantages, including the following:

- (7)
1. **Easily build:** A well formed data element must be enclosed between tags. The XML document can be parsed without prior knowledge of the tags. XML allows one the possibility of defining ones own application relevant tags, such as tags representing data description or data relationships, in our situation to do with lexical items.
 2. **Human readable:** Using intelligible tag names make it possible for the XML to be easily read by people as well as software.
 3. **Machine-readable:** XML was designed to be easy for computers to process. XML is completely compatible with Java, and is portable. Any application can process XML on any platform, as it is a platform-independent language.

4. **XML fully supports Arabic:** We chose to create our data-source as XML files, for optimum support of different platforms. It was also easier as we used Arabic letters rather than Unicode inside the data-source.
5. **XML search engine:** It is easy to extend the search sample to display more information about the search. Search via the Java API Document Object Model (DOM) was found to be the ideal tool for searching collections of XML documents, that is, our lexicon.

6.2 Lexicon interface

In order to allow for robust user interaction with the lexicon, we use a graphical interface to capture the information for each part of speech. The user selects the part of speech of the word to be added, and is then presented with only the attributes relevant to the selected part of speech. The interface also limits the user's selections to acceptable values and ensures that all attributes are filled.

With this technique, we minimize the risk of human errors, and therefore the information is more accurate. The graphical interface is quicker and easier when a user adds a new word in the lexicon within the XML data source. Figure 8 shows the entry interface that is implemented as part of the UniArab system.

Figure 8: The Lexicon Interface of UniArab

7 Lexical representation in UniArab

Lexical frames represent the language-dependent lexicon. We use an XML data source to represent the UniArab lexicon. The lexicon creates pointing references to corresponding conceptual frames with associated attributes for each word. These frames also have relations which link them to verb class frames, which are organized hierarchically according to the particular language, here, Arabic and English.

In Phase 3 of our Interlingua Bridge PARSE→GENERATE framework, the UniArab system tokenizes a sentence into words, and then sends each word to the search engine within the Lexicon to query the category of each word plus determine all attributes associated with that word. The Lexicon returns the corresponding category and its attributes. The Morphology Parser, Phase 5, receives the word metadata and ensures that the properties of the words are consistent. The verb attributes, in particular, are of critical importance in correctly extracting sentence logical structure

further down the processing chain, helping to answer the basic question 'Who does what to whom?'

In free word order sentences of Arabic, multiple orders are possible including VSO, VOS or SVO (Figure 9). The attributes of the verb define the gender of the subject. Given a masculine gender of the verb, for example, the Syntactic Parser will look for a masculine proper noun to make the actor for this sentence. If there is more than one masculine proper noun in such a case, then Modern Standard Arabic defines the first proper noun as the actor. The Morphology Parser will, in future research, be extended so that it can deal with words that are defined in multiple categories, deciding which should be processed. Meanwhile the Syntactic Parser, so far, has only been implemented for extracting word order, though it will be extended to deal with word ambiguities in future versions.

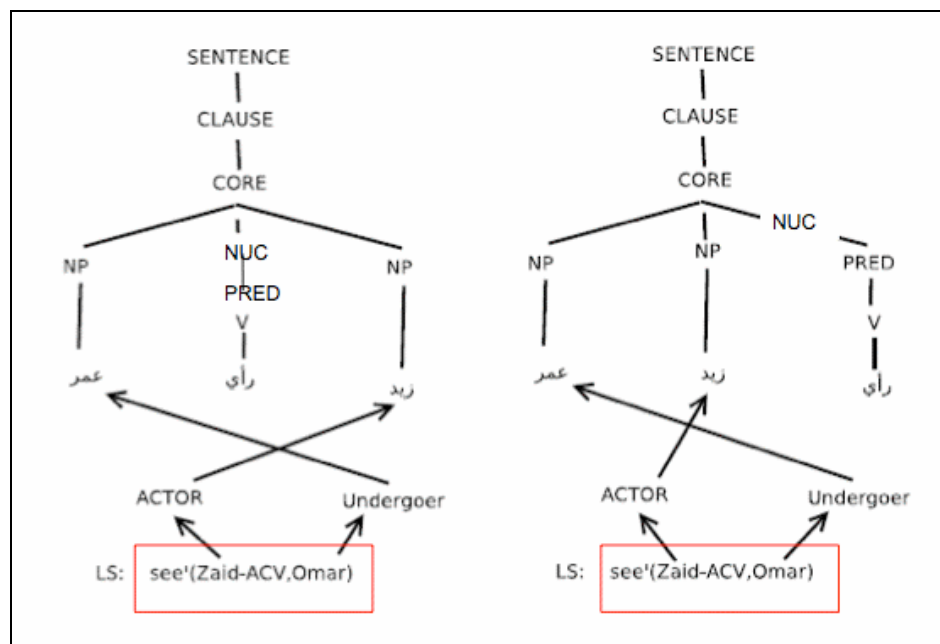


Figure 9: The linking of the Arabic clause under free word order

7.1 Lexical properties

The structure of the Lexicon including the properties stored for each word category is indicated in Figure 10. For all categories, an Arabic word is stored along with its English representation. There is an isomorphic mapping, importantly at the semantic level via the Interlingua Bridge (RRG) logical structures, from the source to the target language of non-complex sentences that UniArab processes up to now. A level of word ambiguity is supported in the structure, with each possible case stored as a separate record. All search results will be passed to the Morphology Parser to decide which is taken.

Since the verb is the key component when analysing using RRG, each verb has an associated logical structure (Figure 11), which is later used to determine the logical structure of the full sentence. The tense of the verb is also stored within its metadata along with the person.

قرأ

EnglishTranslate="read"

LogicalStructures= "<TNS:PAST[do'(x,[read'(x,y)])]>"

NumberVerb="sg"

P.O.S="Verb"

genderVerb="M"

personVerb="3rd"

tenseVerb="PAST"

/>

Figure 10: Fragment - RRG lexical entry in XML for verb read

The verb type also stores the gender, which in Arabic must be either masculine or feminine; there is no neutral gender. The number property in Arabic can be singular, dual or plural. These properties help the Syntactic Parser analyse the sentence, since there must be agreement with the subject and verb, among other rules.

Verb lexicon - fragment as XML

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<Verbs>
  <EnglishTranslate="read" LogicalStructures="&lt;TNS:PASS[do{'x',[read{'x,y'}}]&gt; NumberVerb="sg" P.O.S="Verb" genderVerb="M" personVerb="3rd" tenseVerb="PAST" حُرِفَ
  <EnglishTranslate="wrote" LogicalStructures="&lt;TNS:PASS[do{'x',[write{'x,y'}}]&gt; NumberVerb="sg" P.O.S="Verb" genderVerb="F" personVerb="3rd" tenseVerb="PAST" كُتِبَ
  <EnglishTranslate="played" LogicalStructures="&lt;TNS:PASS[played{'x,y'}]&gt; NumberVerb="sg" P.O.S="Verb" genderVerb="M" personVerb="3rd" tenseVerb="PAST" لَعِبَ
  <EnglishTranslate="wrote" LogicalStructures="&lt;TNS:PASS[do{'x',[write{'x,y'}}]&gt; NumberVerb="sg" P.O.S="Verb" genderVerb="M" personVerb="3rd" tenseVerb="PAST" كُتِبَ
  <EnglishTranslate="loves" LogicalStructures="&lt;TNS:PRES[do{'x',[love{'x,y'}}]&gt; NumberVerb="sg" P.O.S="Verb" genderVerb="M" personVerb="3rd" tenseVerb="PRES" أَحِبَّ
  <EnglishTranslate="loves" LogicalStructures="&lt;TNS:PRES[do{'x',[love{'x,y'}}]&gt; NumberVerb="sg" P.O.S="Verb" genderVerb="F" personVerb="3rd" tenseVerb="PRES" أَحَبَّتْ
  <EnglishTranslate="drank" LogicalStructures="&lt;TNS:PASS[do{'x',[drink{'x,y'}}]&gt; NumberVerb="sg" P.O.S="Verb" genderVerb="M" personVerb="3rd" tenseVerb="PAST" شَرِبَ

```

Noun lexicon - fragment as XML

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<Nouns>
  <EnglishTranslate="book" Number="sg" PartOfSpeech="Noun" gender="M" type="Indef" كِتَاب
  <EnglishTranslate="the book" Number="sg" PartOfSpeech="Noun" gender="M" type="def" الْكِتَاب
  <EnglishTranslate="books" Number="pl" PartOfSpeech="Noun" gender="M" type="Indef" كُتُب
  <EnglishTranslate="the books" Number="pl" PartOfSpeech="Noun" gender="M" type="def" الْكُتُب
  <EnglishTranslate="free" Number="sg" PartOfSpeech="Noun" gender="M" type="Indef" حُر
  <EnglishTranslate="the food" Number="pl" PartOfSpeech="Noun" gender="M" type="def" الطَّعَام
  <EnglishTranslate="his food" Number="sg" PartOfSpeech="Noun" gender="M" type="def" طَعَامُهُ
  <EnglishTranslate="his hair" Number="sg" PartOfSpeech="Noun" gender="M" type="def" شَعْرُهُ
  <EnglishTranslate="his teeth" Number="pl" PartOfSpeech="Noun" gender="M" type="def" أَسْنَانُهُ
  <EnglishTranslate="his clothes" Number="pl" PartOfSpeech="Noun" gender="M" type="def" ثِيَابُهُ
  <EnglishTranslate="his shoes" Number="sg" PartOfSpeech="Noun" gender="M" type="def" حُجَّاتُهُ
  <EnglishTranslate="the television" Number="sg" PartOfSpeech="Noun" gender="M" type="def" التِّلْفَاز

```

Figure 11: RRG lexicon in XML

We show a Java code fragment, in Figure 12, which determines the appropriate gender marking on an argument.

8 UniArab Evaluations

Evaluation of MT software is necessary in order to improve system performance and analyse potential problems and, of course, its accuracy and effectiveness. In the evaluation of UniArab we considered many different aspects of the MT system including quality of translation, time for translation, ability to add a new word in the lexicon of the system and resource utilization.

The evaluation of MT systems is a difficult task. This is not only because many different metrics are involved, but also because translation is itself difficult. The first important aspect for a potential test is to determine the translational capability.

Therefore, we needed to draw up a complete overview of the translational process, in all its different aspects.

A good translation has to effectively capture the meaning. This involves establishing the size of the translation task, is it machine legible and if so, according to which standards? Current general function MT systems cannot translate all texts consistently. Output can have very poor quality. It is to be mentioned that the ‘*subsequent editing required*’ increases, as translation quality gets poorer (Turian et al. 2003).

```
public static String verbGender = "NON";
public static String translate = "";
public static String LS1 = "";
public static String LS0 = "";
//public
//static String toBe1 = "";
static String [] allAttribute2;

public static void GenerationLS1(String [] allAttribute, String [] ArabicSentence)
{
    allAttribute2 = allAttribute;
    int numSubject = 0;
    //who do what
    for(int n = 0 ; n < allAttribute.length; n++)
    {
        if (allAttribute[n].equals("Verb"))
        {
            // there is a verb
            if (allAttribute[n+1].equals("M"))
            {
                //the gender of verb = M
                verbGender = "M";
                //Add LS to string LS
                LS0 = allAttribute[n+2];
            }
            else if (allAttribute[n+1].equals("F"))
            {
                // the gender of verb = F
                verbGender = "F";
                LS0 = allAttribute[n+2];
            }
            else if (allAttribute[n+1].equals("NoGender"))
            {
                // the gender of verb = F
                verbGender = "NoGender";
                LS0 = allAttribute[n+2];
            }
        }
    }
    } // end loop who do what
```

Figure 12: Java code fragment that determines the appropriate gender marking

Given the scale of the lexicon implemented in this work so far, we evaluate the effectiveness and accuracy of UniArab by comparison of output results against an ideal output produced by hand by a native Arabic L1 speaker. We created variants of Arabic sentences that represent all possible structures of the sentences that UniArab can translate. We then make a comparison between human-translated and machine-translated versions. At the moment, the lexicon is categorised into seven parts of

speech. We have designed the GUI so that when adding a specific word to the lexicon, only the related options are presented to the user for that part of speech. This minimises errors when entering data. As our research extends, we expect to modify the categorisation of the lexicon to allow for more complicated word types.

UniArab does not process ambiguous words or complex sentences, so far, in this research. This research focussed first on discovering whether the logical structure of a sentence, based on RRG can be used for translation. Hence, we decided to limit the scope of the project to exclude ambiguity resolution, since this is work in a new area that has not been investigated before. We fully expect to expand the system to allow it to cope with ambiguity in the future. The system's reliability and accuracy depends on the content of the lexicon in the XML data source and cannot handle words not in the lexicon. However, it manages this intelligently by determining the 'x' and 'y' argument slots in the logical structure and inserting the (unknown) Arabic nominal into the correct slot. This native Arabic word is then carried through to the English translation. to handle unknown words. UniArab does not process single words, even if those words are in its lexicon, because UniArab is built on the logical structure of verbs. The missing or unknown word can then be easily inserted into the lexicon.

Therefore, for the processing of unrecognised Arabic words, where a word is not available in the lexicon, but the logic structure is recognised, then UniArab will output a correctly structured translation, but with the unknown Arabic word in its position within the English sentence (Figure 13). This makes the system resilient to slight misspellings (in nominals), which can be recognised and corrected by the human translator.

The screenshot shows the UniArab System 2009 interface. It has two main text areas at the top. The left area, titled 'Here is your translation', displays 'Adam drove' and 'السيارة' (the car). The right area, titled 'Enter an Arabic Sentence', contains the Arabic text 'آدم قاد السيارة' (Adam drove the car). Below these are 'Clear / امح' and 'Enter / أدخل' buttons. A central text box shows the logical structure: `<TNS:PAST[do'(Adam,drive'(Adam,y))]>`. Below this is a message in Arabic and English: 'إذا اردت ان تضيف كلمات جديدة باللغة العربية: اختر القسم المناسب ثم ابدأ جميع الحقول' and 'If you need to add new Arabic words in the database: click on the appropriate tab'. At the bottom, there are several tabs for adding new words: 'Add Arabic Demonstratives / أضف اسم إشارة جديد', 'Add Arabic Adverb / أضف ظرف جديد', 'Add other Arabic Word / أضف أي كلمة أخرى', 'Add Arabic Verb / أضف فعل جديد', 'Add Arabic Noun / أضف اسم جديد', 'Add Arabic Adjective / أضف صفة جديدة', and 'Add Arabic Proper nouns / أضف اسم علم جديد'. Below the tabs are input fields for 'Add Arabic Verb / أضف الفعل', 'English translate / الترجمة', 'Logical structures / الهياكل المنطقية', 'Add number / العدد', 'Add Person / أضف نوع الضمائر', 'Add tense / الزمن', and 'Add gender / النائية والذكور'. At the very bottom are 'Enter / أدخل' and 'Clear / امح' buttons.

Figure 13: Processing unrecognised Arabic words

In our comparison with other translation systems we have used non-complex sentences. While UniArab is limited to non-complex sentences and has appropriate coverage within these, we believe it is essential to reach high quality translation of

these sentences in the first instance, in order to be able to expand to high quality translations of more complex sentences. We can see that the existing tools from Google and Microsoft cannot even achieve reasonable translations of simplex sentences, so how can we expect them to give high quality translations of larger text? We have found that small errors in the initial analysis of a sentence can cause huge errors in the final translation, so high quality analysis is very important.

We have MT processing of non-complex sentences in Arabic and their equivalent translations in English. By non-complex we mean any clause that does not have a juncture relation, of any kind, in RRG terms. We have covered a representative broad selection of verbs across intransitive, transitive and ditransitive constructions in simplex sentences in active voice. Complex sentences are beyond the research scope to date, but we intend to address this in the next version. However, we do address copula-like nominative clauses in Arabic. We tested UniArab in many ways. We tested single sentences and multiple sentences. UniArab easily deals with more than one sentence as input and its output matches. That is, UniArab can accept and translate a text consisting of many sentences. Additionally, we entered random sentences together in one input or as individual sentences.

In our testing and evaluation of UniArab, we subjected the UniArab System to a series of tests in a wide range of sentence categories. For each test we compared the results obtained through UniArab to those obtained when using translation engines from Google and Microsoft. We also presented a human-translated equivalent to each. In contrast, the Google and Microsoft translators gave mixed results. In many cases, sentence meaning was lacking, and even some basic constructs could not be translated.

This, perhaps, is due to their focus on translating long sentences and paragraphs via statistical means rather than using semantically oriented linguistic structured to drive the translation. We highlighted this by comparing them to UniArab for longer compound sentences and found that they did indeed convey more of the meaning. These results suggest that RRG is a promising candidate for Arabic to English machine translation, and as the grammar is developed, the system should begin to cope with more complicated sentences. For non-complex sentences (intransitive, transitive and ditransitive) it clearly outperforms existing systems for the production of grammatically correct translations.

In summary then, with respect to our evaluation, given the proof of concept work implemented so far, we were very careful to rigorously test and evaluate the performance of UniArab, and its accuracy in the fast production of grammatically correct sentences in the target language. We created a testbed of sets of sentences in Arabic to represent all of the possible combinations of structures and possibilities for the sentences that we wanted UniArab to be able to translate. We then executed UniArab for these and compared our results with that of a human L1 Arabic translator. We also tested the Google and Microsoft automatic machine translation services with our data set of sentences to compare our UniArab results against all of these, with some very interesting and surprising results.

Our testbed of grammatically correct sentences in Arabic and their equivalent translations in English have a good coverage and we tested UniArab with these. We additionally tested inputs of both single sentences and multiple sentences (as in a

paragraph of Arabic text). UniArab is designed to easily deal with more than one sentence as input and its output correctly and grammatically matches.

9 The accuracy of the translations

In this section we review the accuracy of the translations and compare the results of our system, UniArab based on the RRG linguistic model, with results from Google and Microsoft. While not rehearsing the complete set of evaluations here, in summary, our testing has include the following (8) testing criteria:

- (8) UniArab Evaluation tests
 - 1. Evaluation test-1: Copula with present progressive
 - 2. Evaluation test-3: Verb noun - one argument in different tenses
 - 3. Evaluation test-3: Generating the English copula verb ‘to be’
 - 4. Evaluation test-4: Free word order (V N N - first possibility)
 - 5. Evaluation test-5: Free word order (V N N - second possibility)
 - 6. Evaluation test-6: Free word order (N V N - third possibility)
 - 7. Evaluation test-7: Pro-drop sentence
 - 8. Evaluation test-8: Intransitive sentences
 - 9. Evaluation test-9: DTV word order
 - 10. Evaluation test-10: DTV word order (with prepositional phrase)

We provide indicative sample outputs, plus a screen capture that demonstrates the actual results, for a number of these in Appendix 1.

9 Summary

In this paper we have presented an Arabic-to-English machine translation system called UniArab, based on our implementation of an Interlingua Bridge framework that was programmed in Java with the lexicon built in XML, and which is based on the Rule and Reference Grammar model. We detailed the design of the system and how it was built to accommodate specifics of the Arabic language and the generation of English translations. We presented a high-level view of the system framework and defined our evaluation criteria for measuring system performance. We also talked about the challenges of machine translation, with a specific focus on those specific to the Arabic language. The main topic of investigation is the development of a framework for translating Arabic to English based on RRG. The framework is designed to demonstrate the capabilities of RRG as a base for machine translation. This work has shown that RRG facilitates the translation process from a specific source human language to other target languages.

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Appendix-1: Evaluation test results

Evaluation Test-1: Copula with present progressive

In Table 1, the output of the Google translator is faulty in respect of the tense and the marking of the *V-ing* form in English, and the non-use of the copula verb *to be*. Microsoft's MT failed to translate most of the sentence with respect to tense, copula vs. matrix verb and word order. UniArab successfully translates the sentence entirely. Figure 13 shows this sentence output in the UniArab system.

Arabic	يشرب عمر اللبن <i>yšrb mr āllbn</i>
Human	Omar is drinking the milk.
Google	Omar drink milk
Microsoft	drink milk Omar
UniArab	Omar is drinking the milk .

UniArab System 09

Here is your translation: Omar is drinking the milk.

Enter an Arabic Sentence: يشرب عمر اللبن

Clear / امسح Enter / أدخل

<TNS:PRES[do'(Omar,[drink'(Omar,milk)])]>

إذا أردت أن تضيف كلمات جديدة باللغة العربية: اختار القسم المناسب ثم أضف جميع الحقول.
 If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Demonstratives / أضف اسم إشارة جديد / أضف أي كلمة أخرى / Add other Arabic Word
 Add Arabic Verb / أضف فعل جديد / Add Arabic Noun / أضف اسم جديد / Add Arabic Adjective / أضف صفة جديدة / Add Arabic Proper nouns / أضف اسم علم جديد

Add Arabic Verb/الفعل / English translate/الترجمة
 Logical structures/الهياكل المنطقية / Add number / العدد / Add Person / أضف نوع الضمائر

Add tense/الزمن / Add gender / النائية والذكور / Enter / أدخل / Clear / امسح

Evaluation Test-2: Verb noun - one argument in different tenses

Arabic	شرب عمر اللبن <i>šrb mr allbn</i>
Human	Omar drank the milk
Google	Omar drinking milk
Microsoft	drinking milk Omar
UniArab	Omar drank the milk.

UniArab System 09

Here is your translation: Omar drank the milk.

Enter an Arabic Sentence: شرب عمر اللبن

Clear / امسح Enter / ادخل

<TNS:PAST[do'(Omar,[drink'(Omar,milk)])]>

إذا أردت أن تضيف كلمات جديدة باللغة العربية: اختار القسم المناسب ثم أضف جميع الحقول
If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Demonstratives / أضف اسم إشارة جديد / Add Arabic Adverb / أضف ظرف جديد / Add other Arabic Word / أضف أي كلمة أخرى / Add Arabic Verb / أضف فعل جديد / Add Arabic Noun / أضف اسم جديد / Add Arabic Adjective / أضف صفة جديدة / Add Arabic Proper nouns / أضف اسم علم جديد

Add Arabic Verb / أضف الفعل / English translate / أضف الترجمة / Logical structures / الهياكل المنطقية / Add number / العدد / Add Person / أضف نوع الضمائر

Add tense / الزمن / Add gender / الأنثى والمذكر / Enter / ادخل / Clear / امسح

Evaluation Test-3: Copula Verb 'to be'

Arabic	هو مهندس <i>hw mhnds</i>
human-translated	He is an engineer.
Google	Is the architect of
Microsoft	is the engineer
UniArab	he is an engineer.

UniArab System 09

Here is your translation: **He is an engineer.**

Enter an Arabic Sentence: هو مهندس

Clear / امسح Enter / أدخل

be'(he,[engineer'])

إذا أردت أن تضيف كلمات جديدة باللغة العربية: اختار القسم المناسب ثم أضف جميع الحقول
If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Verb/الفعل: English translate/الترجمة:

Logical structures/المنطقية: Add number / العدد: Add Person / أضف نوع الصمائر:

Add tense/ الزمن: Add gender / التأنيث والتذكير: Enter / أدخل: Clear / امسح:

Evaluation Test-4: Free word order (V N N - first possibility)

Arabic	يحب قيس ليلي <i>yhb qys lylā</i>
human-translated	Qays loves Laila
Google	Qais likes of Laila
Microsoft	Love Qais laili
UniArab	Qays loves Laila

UniArab System 09

Here is your translation: Qays loves Laila.

Enter an Arabic Sentence: يحب قيس ليلي

Clear / امسح Enter / ادخل

<TNS:PRES[do'(Qays,[love'(Qays,Laila)])]>

إذا أردت أن تضيف كلمات جديدة باللغة العربية: اختار القسم المناسب ثم اضغط جميع الحقول
If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Demonstratives / أضف اسم إشارة جديد Add Arabic Adverb / أضف ظرف جديد Add other Arabic Word / أضف أي كلمة أخرى

Add Arabic Verb / أضف فعل جديد Add Arabic Noun / أضف اسم جديد Add Arabic Adjective / أضف صفة جديد Add Arabic Proper nouns / أضف اسم علم جديد

Add Arabic Verb/الفعل English translate/الترجمة

Logical structures/الهياكل Add number / العدد Add Person / أضف نوع الضمائر

Add tense / الزمن Add gender / التانيث والتذكير Enter / ادخل Clear / امسح

Evaluation Test-5: Free word order (V N N - second possibility)

Arabic	يحب ليلي قيس <i>yḥb lylā qys</i>
human-translated	Qays loves Laila
Google	Leila loves measured
Microsoft	Love laili Qais
UniArab	Qays loves Laila

UniArab System 09

Here is your translation

Qays loves Laila.

Enter an Arabic Sentence

يحب ليلي قيس

Clear / امسح

Enter / ادخل

<TNS:PRES[do'('Qays,[love'('Qays,Laila)])]>

إذا أردت أن تضيف كلمات جديدة باللغة العربية: اختار القسم المناسب ثم ابدأ جميع الحقول
If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Demonstratives / أضف اسم إشارة جديد

Add Arabic Adverb / أضف ظرف جديد

Add other Arabic Word / أضف أي كلمة أخرى

Add Arabic Verb / أضف فعل جديد

Add Arabic Noun / أضف اسم جديد

Add Arabic Adjective / أضف صفة جديدة

Add Arabic Proper nouns / أضف اسم علم جديد

Add Arabic Verb / أضف الفعل

English translate / أضف الترجمة

Logical structures / الهياكل المنطقية

Add number / العدد

Add Person / أضف نوع الضمائر

Add tense / الزمن

Add gender / الأنثى والذكور

Enter / ادخل

Clear / امسح

Evaluation Test-6: Free word order (V N N - third possibility)

Arabic	قيس يحب ليلي <i>qys yhb lylā</i>
human-translated	Qays loves Laila
Google	Qais likes of Laila
Microsoft	Qais love laili
UniArab	Qays loves Laila

UniArab System 09

Here is your translation

Qays loves Laila.

Enter an Arabic Sentence

قيس يحب ليلي

Clear / امسح

Enter / أدخل

<TNS:PRES[do'(Qays,[love'(Qays,Laila))]>

إذا أردت أن تضيف كلمات جديدة بالكتابة اليدوية: اختار القسم المناسب ثم ابدأ بجمع الحروف
If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Demonstratives / أضف اسم إشارة جديد

Add Arabic Adverb / أضف ظرف جديد

Add other Arabic Word / أضف أي كلمة أخرى

Add Arabic Verb / أضف فعل جديد

Add Arabic Noun / أضف اسم جديد

Add Arabic Adjective / أضف صفة جديدة

Add Arabic Proper nouns / أضف اسم علم جديد

Add Arabic Verb/الفعل

English translate/الترجمة

Logical structures/الهيكل المنطقي

Add number / العدد

Add Person / أضف نوع الضمائر

Add tense/ الزمن

Add gender / التانيث والتذكير

Enter / أدخل

Clear / امسح

Evaluation Test-7: Pro-Drop

Arabic	فاتتني الطائرة <i>fāttny ālṭā'yrh</i>
human-translated	I missed the plane.
Google	Missed the plane
Microsoft	فاتتني <i>fāttny</i> plane
UniArab	I missed the plane.

UniArab System 09

Here is your translation: **I missed the plane.**

Enter an Arabic Sentence: فاتتني الطائرة

Clear / امسح Enter / ادخل

<TNS:PAST[do'(I,[miss'(I,plane)])]>

إذا أردت ان تضيف كلمات جديدة باللغة العربية: اختار القسم المناسب ثم املأ جميع الحقول
If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Demonstratives / أضف اسم إشارة جديد / أضف اى كلمة اخرى / Add Arabic Adverb / أضف ظرف جديد / Add other Arabic Word / أضف اسم علم جديد / Add Arabic Proper nouns / أضف اسم تلم جديد / Add Arabic Verb / أضف فعل جديد / Add Arabic Noun / أضف اسم جديد / Add Arabic Adjective / أضف صفة جديد / Add Arabic Verb / أضف الفعل / English translate / أضف الترجمة

Logical structures / الهياكل المنطقية

Add tense / الزمن Add gender / النائية والتذكير Enter / ادخل Clear / امسح

Evaluation Test-8: Intransitive sentences

Arabic	صهيب يقرأ <i>shyb yqra</i>
human-translated	Suhaib reads.
Google	Souhaib read
Microsoft	suhaib reads
UniArab	Suhaib reads.

UniArab System 09

Here is your translation: Suhaib reads.

Enter an Arabic Sentence: صهيب يقرأ

Clear / امسح Enter / ادخل

<TNS:PRES<<[do'(Suhaib,[read'(Suhaib)])]>>>

إذا أردت أن تضيف كلمات جديدة باللغة العربية: اختار القسم المناسب ثم املأ جميع الحقول
If you need to add new Arabic words in the database: click on the appropriate tab

Add Arabic Demonstratives / أضف اسم إشارة جديد Add Arabic Adverb / أضف ظرف جديد Add other Arabic Word / أضف أي كلمة أخرى

Add Arabic Verb / أضف فعل جديد Add Arabic Noun / أضف اسم جديد Add Arabic Adjective / أضف صفة جديدة Add Arabic Proper nouns / أضف اسم تعلم جديد

Add Arabic Verb/الفعل English translate/الترجمة

Logical structures/الهياكل المنطقية Add number / العدد Add Person / أضف نوع الضمائر

Add tense/ الزمن Add gender / النائية والذكور Enter / ادخل Clear / امسح

Evaluation Test-9: DTV word order

Arabic	عمر أعطى خالد الكتاب <i>mr uṭā ḥāld ālktāb</i>
human-translated	Omar gave Khalid the book.
Google	Omar Khalid gave the book
Microsoft	Omar gave Khaled book
UniArab	Omar gave Khalid the book.

UniArab System 09

Here is your translation

Omar gave Khalid the book.

Enter an Arabic Sentence

عمر أعطى خالد الكتاب

Clear / امسح

Enter / أدخل

<TNS:PAST[do'(Omar,0)CAUSE[BECOME_have'(Khalid,book)]]>

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Add gender / الأنثى والذكور

Enter / أدخل

Clear / امسح

Evaluation Test-10: DTV word order (with prepositional phrase)

Arabic	عمر أعطى لخالد كتاب <i>mr aṭā lhāld ktāb</i>
human-translated	Omar gave a book to Khalid.
Google	Omar Khaled gave a book
Microsoft	Omar gave Khalid book
UniArab	Omar gave a book to Khalid.

UniArab System 09

Here is your translation

Enter an Arabic Sentence

Omar gave a book to Khalid.

عمر أعطى لخالد كتاب

Clear / امسح

Enter / أدخل

<TNS:PAST[do'(Omar,0)CAUSE[BECOME_have'(to Khalid,book)]]>

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Logical structures/الهياكل المنطقية

Add number / العدد

Add Person / أضف نوع الضمائر

Add tense/الزمن

Add gender / النائيب والتذكير

Enter / أدخل

Clear / امسح

Serial verb constructions in three-participant Events: Argument Structure and Lexical-syntactic Interface

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Abstract

This paper explores argument realization in three-place predicates, such as to give/bring/take something to someone, in languages in which three-place predicates are formed by serial verb constructions (henceforth SVC). Differently from languages like English or Italian, in which the syntactic three-place predicate corresponds to a simple predicate involved by the semantic components “X causes Y to receive Z” (Goldberg 1995: 75; Haspelmath 2005: 426), in serializing languages, in order to express a third argument, an additional verb must be introduced to explicit the recipient or other thematic relations.

The proposed analysis allows the description of these constructions and the investigation of several of their syntactic-semantic features, with particular reference to transitivity and degree of syntactic cohesion among serial predicates, by differentiating them from other multiverbal sequences characterized by dissimilar argument structures.

Based on the data, we will show how the argument structure and lexical-syntactic interface as developed by Role and Reference Grammar (RRG) (Van Valin & La Polla 1997; Van Valin 2005) can provide an interesting descriptive and theoretical framework for investigating this type of constructions and the interclausal semantic relations between predicates events.

Keywords: ditransitive verbs, serial verb constructions, argument structure, lexical-syntactic interface, eventhood

1. Semantic classification of three-participant events

The values of three-place constructions, as they are examined in this study, have been grouped into semantic categories (see below), based on the classification of Margetts and Austin (2007), who outline an interesting range of typological variation with respect to how languages realize three-place predicates morphosyntactically, including SVCs, and on earlier classifications (see in particular Croft 1985, Pinker 1989, Goldberg 1995, Levin 1993):

- (a) *Agent causes recipient to receive theme*
 - *Verbs of Change of Possession: Give Verbs*
 - *Verbs of Sending and Carrying: Send verbs; Bring and Take*
 - *Verbs of Throwing: Throw verbs*
- (b) *Agent causes theme to move to location*
 - *Verbs of Putting: Put Verbs*
- (c) *Agent intends to cause recipient to receive theme*
 - *Verbs of Change of Possession: Verbs of Obtaining (Get Verbs)*
 - *Verbs of Creation*
- (d) *Agent acts to communicate information to recipient*
 - *Verbs of Communication: Verbs of Transfer a Message*

According to Margetts and Austin (2007), three-place predicates and other expressions of three-participant events generally take (1) an *agent-like A*, (2) a participant which we will label *R* on the basis of its commonest role as *recipient* (but which may also be a *beneficiary*,

goal, addressee, location or source), and (3) a *theme* (typically some thing or information conveyed by A to R).

The common event performed by the three arguments and referred by the lexico-grammatical descriptions of these predicates consists of a general *transfer-of-possession* in which the agent causes a change of location of something else (usually the theme). In fact, the verb ‘give’ prototypically suggests a transfer event with an actively instigating agent, a transferred patient and an animate recipient¹.

Relating to verbs of communication, such as ‘tell’, ‘ask’, ‘explain’, ‘show’, ‘teach’, ‘read’, ‘cite’, etc., we can speak of “abstract transfer”, since Newman (1996: 136) argues that there is a connection between the situation types underlying ‘give’ and for example ‘tell’, in that the semantics of ‘tell’ as a communication verb is similar to a specific metaphorical extension of (literal) ‘give’. Therefore, in SVCs with a transitive motion-causative verb as, for example, ‘speak’, it is words that move towards an addressee-listener.

3. Defining SVCs

The main areas of diffusion of SVCs are West Africa (in particular the Kwa group and Atlantic Creoles)², South-East Asia (Hmong-Mien, Tai-Kadai and Mon-Khmer groups)³, America (central, southern and northern area)⁴ and Oceania (Austronesian languages, Papuan, Melanesian pidgins⁵ and Australian languages⁶).

¹ The real issue is whether we identify three-place predicates with those that “require” or those that “allow” three syntactic arguments. The latter ones are likely less restricted in the languages of the world. The notion of ditransitivity can be extended to other predicates that have identical, or similar, morphosyntactic behavior such as ‘mail’. ‘Mail’ has three-place participant roles in its lexical representation. The syntax required in sentences in which all participants are realized is identical to that of the verb ‘give’. The only difference is that the argument structure for ‘mail’ also includes an *agent/theme arrangement*, since ‘mail’ is an optional three-place verb. Thus, a sentence such as *The girl mails a letter* is grammatical even without the third argument being present in the syntax. According to Jackendoff (1990: 196), the optional argument is frequent in the presence of spatial predicates that indicate “to put something in motion” such as ‘send’ or ‘throw’ (these verbs basically describe two-participant events in which one entity instantaneously imparts a force on a second). In the sentence *I sent a book to Mary*, the constituent ‘Mary’, traditionally classified as a goal-possessor argument of the verb, corresponds to a semi-argument, or non-nuclear argument that provides optional information. Differently, the English verb ‘put’ is an obligatory three-place predicate (or *verb elaborator*) because all three of its arguments must be represented when it is used, as in: *The boy_{AGENT} put the book_{THEME} on the table_{GOAL}* (however, this is not the case in other languages). Conversely, the verb ‘give’ has only one argument structure arrangement (*agent/theme/goal*) and, therefore, a sentence such as **The girl gives a book* or **She gave to the girl* is ungrammatical. In the latter construction, the theme argument is generally expressed if a path is predicated of it, since it is normally expressed by certain “core” grammatical relations. Nevertheless, it is assumed that the verb *give* which is taken to be the prototypical ditransitive predicate, can also take only two arguments. Goldberg (2005) observes, then, that verbs often actually allow arguments to be omitted under certain discourse conditions. In fact, when it is used with a meaning like that of contribute or donate, it can also appear without an overt theme argument: *He gave to the Foundation*. In this case, the semantic representation is not concomitant with the syntactic representation or vice versa.

² Besides the sources listed in this paper, check also Ansre (1966), Welmers (1968), Stahlke (1970), Bamgboṣe (1974), George (1976), Thomas (1978), Sebba (1987), Lefebvre (1994).

³ See Matisoff (1969), Suwilai (1987), Seuren (1990), Durie (1995), Li & Thompson (1981), Matthews & Yip (1994), Matthews (2006), Diller (2006).

⁴ See Déchaine (1987), Salamanca (1988), Craig & Hale (1988), Zavala (2006); Everett (1986), Payne & Payne (1990); de Reuse (2005).

⁵ See Foley (1991), (2005), Bradshaw (1993); Finney (2004); Durie (1997), Dixon (1998), Lynch (2004), Margetts (2004), Mosel (2004), Naess (2004), Reinig (2004).

⁶ See Foley (1986), Green (1987), Eather (1990), Evans (1995), Green (1995), Mc Kay (2000).

When we look at descriptions of SVCs cross-linguistically, we find very different surface constructions. Hence, various general definitions have been developed for serialization.

Semantically, SVCs describe composite events, which are made up of two or more distinct subevents as part of a single overall plan⁷. In formal terms, a prototypical SVC typically contains only one grammatical subject and shares at least one argument, without any overt marker of coordination, subordination or syntactic dependency. However, neither subject- nor object-sharing is obligatory. For instance, switch-subject serial constructions are those in which the object of a preceding verb becomes the subject of a following verb, generally with cause-and-result semantics. In this case, V1 has a different logical subject. Furthermore, their intonational properties are those of a monoverbal clause (Schachter 1974), since SVCs are grammatically one word. Consequently, they have just one tense, aspect, mood, and polarity value. Each of their grammatical categories can be marked on every component or a category may be marked once per construction (Aikhenvald 2006:1)⁸.

An example of serial verb strategy in which the three-participant events are expressed by two verbs which combine in a complex construction sharing the three arguments between them is given in (1):

- (1) *Rópu ke - wé leng nì*
 book 3SG:NF- take:F give 1SG⁹
 ‘He gave me the book.’ (Skou; Donohue 2006: 390)

In this construction, the action of giving is expressed by the sequence of two verbs, *wé* ‘take’ (V1) and *leng* ‘give’ (V2), which form a complex predicate. The one (*wé*) introduces the direct object *ropu* ‘book’ and the other (*leng*) the pronominal object *nì*. The subject is indicated by the proclitic *ke-* affixed to the serial verb *wé*, a supplementary form which refers to a singular feminine object (F).

In example (2), the three-participant event is differentially expressed by a switch SVC:

- (2) *Aê ka -kêng mo gê -dêng ngoc ngalalê*
 1S 1SR-give taro 3SR-reach GEN1S child
 ‘I gave taro to my child.’ (Jabêm; Brashaw 1993: 151)

This construction shows a syntactic argument missing from the linked core which must be interpreted as being the same as one of the syntactic arguments of the matrix core.

⁷ It is assumed that the speakers of serializing languages perceive events as concatenations of sub-parts or aspects of a single overall event (Lord 1973: 269), the representation of which usually implies an iconic order, which reflects the temporal order of events (Lord 1993: 237). Therefore, the languages differ in the maximum amount of conceptual content that can be naturally packaged within a single clause and hence readily experienced as a macro-event (Talmy 2000: 215).

⁸ There are many definitions given by scholars in literature, reflecting the particular interest reserved for SVCs. One of the first dates back to Christaller (1875) who defined these constructions in Twi (a Sub-Saharan language, Ghana) as an “accidental combination, two or more different predicates expressing successive actions have the same subject and are merely joined together without conjunction (SVCs)”. The term “serial verb constructions” was proposed later by Balmer and Grant (1929) and then reintroduced by Stewart (1963).

⁹ List of abbreviations: 1= first person; 2= second person; 3= third person; AG=agent; ASP= aspect; ABS= absolutive; APPL= applicative; DAT= dative; DET= determiner; CL= classifier; CONV= converb; DIST= distal; ERG= ergative; F= feminine; FUT= future; GEN= genitive; IMPER= imperative; INDEF= indefinite; IR= irrealis; LOC= locative; LOG= logophoric; M= masculine; NF= non-feminine; NOM= nominative; OBJ= object; OR= object reference; P= plural; PST= past tense; REM.PST= remote past tense; PERF= perfective; PL= plural; PRO= pronoun; POSS= possessive; S:S= subject:singular person; SG= singular; SUB= subject; SPEC= specifier; SS= same subject; INSTRUM= instrumental; TOP.NON.A/S= topical non-subject clitic; TR= transitive; VIS= visible.

The matrix core argument interpreted as being the same as the missing syntactic argument in the linked core is the CONTROLLER (in this case, the OBJECT CONTROL *taro*).

These constructions contrast with English or Italian equivalents in that sentences of non-serializing languages need either a relative clause, *He took the book that he gave to me/Prese il libro che diede a me*, or coordinate conjunctions, *He took the book and gave (it) to me/Prese il libro e me (lo) diede*, in order to express the similar meaning of [book he take give him] ‘He gave me the book’ (see the example Skou (1) above).

4. SVCs and other multiverbal constructions

As pointed out above, the high number of supposedly SVCs identified in linguistic descriptions is, partly, due to “some disagreement as to what of construction should be included under this label” (Kroeger 1999: 226).

The boundaries between SVCs and other types of syntactic structures may be more complex than usually recognized in literature. The criteria of demarcation remain questionable, to the point that Crowley (2002) proposed a structural continuum between SVCs and other multiverbal constructions, characterized by a gradual loss of syntactic juncture between the two verbal components. In such *continuum*, SVCs are positioned in between *verbal compounds* and *clause chains*, with *core serial verb* closer to the latter, whereas the *nuclear serial verb* is closer to *verbal compounds*:

Verbal compounds > *Nuclear serial verbs* > *Core serial verb* > *Clause chains* > *subordination clauses* > *Coordination clauses* (Crowley 2002:18)

Nevertheless, it is assumed that these criteria, which can be applied in one language to distinguish SVCs from subordination or compounding, simply may not be applicable to all languages.

In this work, SVCs have been differentiated from clause chaining constructions (henceforth CCC) only (see example (3) below). There is an apparent agreement among linguists that CCCs encode a clausal rather than a verbal sequence, since they involve sequences of two or more clauses. Lehmann’s 1989 “Towards a typology of clause linkage” is to be mentioned as he proposes a wide range of parameters distinguishing between CCCs and SVCs¹⁰.

In example (3), the three-place predicate ‘give’ is similarly expressed by the sequence of two verbs, *mi* ‘take’ (V1) and *mo* ‘give’ (V2), preceded by the direct object, *hama* ‘hammer’. The two clauses are linked by the same-subject marker (or equivalent subject marker) on the first predicate:

- (3) *Hama m i-me da mo-mi!*
 hammer take-SS 1SG give:2SG:IMPER-SG:OR
 ‘Give me the hammer.’ (Koiari; Dutton 1996: 19)

¹⁰ The main differences between CCCs and SVCs could be the following ones: the presence of a subject which can refer to a separate event without the arguments sharing (differently from SVCs that prototypically have a single subject and share at least one internal argument), the categories of tense/aspect/mode, the polarity and/or the expressive modality are specified by the predicate in final position (differently from SVCs in which they are usually expressed in both verbs or in the first of the series), the presence of pronouns whose function is to report a coreferential relation between the verbal propositions (topic again later) (differently from SVCs in which such markers are typically absent) (Kroeger 1999: 250). Furthermore, the basic order in clause chains is SOV (differently from SVCs in which the basic order is SVO (Seuren 1990, Haiman & Thompson 1988), but also OV (Crowley 2002)). For further in-depth investigations on this issue, see also Lynch (1983), Longacre (1985, 1996), Lehmann (1988), Ezard (1997), Haiman & Thompson (1998), Crowley (1998) and Kroeger (1999).

The presence of pronouns has as its main function to report a coreferential relation between the verbal propositions (topic again later), differently from SVCs in which such markers are typically absent (Kroeger 1999: 250).

However, this type of construction raises the question of interpretation of sequential verbs that, unlike in Skou (see example (1)), do not form a complex predicate (meant as a single predicate). Such sequential verbs are two distinct predicates with a different argument representation from that of SVCs, as will be shown later by applying the lexical-syntactic interface developed by Role and Reference Grammar (RRG).

5. The sample

The survey provides an overview of three-place predicates in SVCs, mainly as described in the grammars¹¹ of a sample of languages which, though not necessarily typologically and genetically representative, still permit some interesting observations (see *Appendix*).

SVCs identified in this paper are summarized in Table 1 which includes the main input verbs whose combinations produce the corresponding three-place predicates in SV strategies:

¹¹ Obviously, although the authors of the grammatical descriptions from which the data are drawn are all experienced linguistic fieldworkers, it is important to keep in mind that a research based on this kind of sources could imply a measure of imprecision. In fact, the diachronic study of SVCs shows a strong tendency of these constructions to words lexicalization or grammaticalization (SVCs are semantically bleached). Various studies on SVCs suggest that they developed gradually from independent, finite verbal clauses, through various stages of reduced finiteness, towards eventual full grammaticalization. Lehmann (1989: 217) discussed various implicational relationships among these continua, as follows: all of the continua «extend from a pole of maximal elaboration to a pole of maximal compression ... of lexical and grammatical information». The “expansion-compression” idea refers to a situation, where two verbs are involved in the expression of a single proposition, which could involve some degree of inherent instability, such that which ever of the two is the least semantically salient seems destined to become deverbalized (or grammaticalized) in various ways. In case the pressure towards compression persists, we should expect languages with only core layer serialization to move in the direction of nuclear layer serialization as well. In case nuclear layer serialization already occurs in a language, we should expect the process of incorporation to continue to the extent that serialized verbs increasingly lose their verbal status, and become reanalyzed as adverbials and verbal affixes. For instance, serial strategies may evolve towards applicative strategies (in this case, an independent verb like ‘give’ loses its lexical value and becomes a benefactive marker, or a verb like ‘go’ becomes an allative morpheme), adpositional strategies (in this case, a verb like ‘take’ corresponds to an instrumental pre-/postposition, or a verb like ‘give’ to a dative pre-/postposition), directional strategies (in this case, a motion verb corresponds to a deictic marker). In this regard, see in particular the studies of Lord (1973), Bril & Ozanne-Rivierre (2004) and Ross (2004), who describe various degrees of SVCs grammaticalization in compounds, adpositional coverbs or prepositions which introduce the recipient and/or benefactive, and that of Margetts (2007).

	<i>Input verbs</i>	<i>Output verbs</i>		<i>Input verbs</i>	<i>Output verbs</i>
1.	a) [take+go] b) [take+come] c) [take+give] d) [give+come] e) [give+go] f) [give+reach] g) [take+take-give]	'give'	5.	a) [sell+give] b) [sell+take] c) [take+sell]	'sell'
2.	a) [take+give] b) [take+bring] c) [take+go] d) [take+come] e) [take+arrive] f) [take+put.on] g) [bring+go] h) [take+come-give] i) [take+go-give] j) [take+arrive-go]	'bring'	6.	a) [tell+give] b) [say+go] c) [speak+show]	'tell'
3.	a) [send+give] b) [send+go] c) [send+come]	'send'	7.	a) [put+give] b) [put+lie]	'put'
4.	a) [take+throw] b) [take+throw-give]	'throw'	8.	a) [tall+put] b) [give+know]	'teach'
			9.	a) [give+build] b) [build+give]	'construct/build'
			10.	[go+keep]	'take'
			11.	[take+show]	'show'
			12.	[buy+give]	'buy'
			13.	[promise+tell]	'promise'
			14.	[return+give]	'give back'
			15.	[stab+go-reach]	'write'

Table 1. Input verbs in SV strategy

6. Formal properties: contiguous and non-contiguous SVCs

We can see from Table 1 that the meaning of a three-place predicate can be expressed by different sequences of SVs (see examples (5) and (6) below) and, on the other hand, the same sequences may designate different meanings. In (1c), the combination [take+give] expresses the three-place predicate 'give', whereas in (2a) it indicates a verb of continuous causation of accompanied motion in a deictically specified direction, that is the predicate 'bring' (see examples (5) and (6) below). The V2 in the constructions exemplified below is a three-argument predicate that selects for a goal or location argument in addition to a theme, hence, only one argument follows V2:

- (4) *Nɛ̌k ʔaoy siəvphɿu mɔ̌:k khnom*
2SG take book come 1SG
'You give me a book.' (Khmer; Jacob 1968:78)
- (5) *Emil pan liv la bay Mari*
Emil take book DET give Mari
'Emil gave the book to Mary.' (Haitian Creole language; Andrews & Manning 1999: 105)
- (6) *A dika lidgã n kō (a) Kulgã*
3SG take money give (it) Kulga
'He brought money to Kulga.' (Mooré; Givón 1975: 58)

We may observe, moreover, that in examples (4) and (6) the output predicate is the result of SV components, which are characterized by semantic features different from those of the simple three-place predicate; whereas, in construction (5), the outgoing verb corresponds to one of the two serial constituents [take+give] = 'give', since the SV has to introduce the theme argument.

Therefore, it is necessary to pay particular attention to the type of transitivity that distinguishes SVs. In example (4), there is a syntactic-semantic mismatch between the transitive verb ‘take’ (V1) and the intransitive one ‘come’ (V2).

As regards their formal properties, SVCs illustrated in the previous three examples are non-contiguous, since they allow other constituents to occur between the components; whereas, the following ones (7) and (8) are contiguous, since they do not allow any other constituents to go in between their components:

- (7) *Malí ma dyana ba da pe-déli*
 Mary take banana go give father
 ‘Mary brought banana to her father.’ (Fa d’Ambu; Post 1995: 201)
- (8) *Me -ke -lam*
 3SG-take-come
 ‘He brought it.’ [lit. he took (and) he came] (Sakao; Durie 1988: 10)

In the latter construction, SVs form together one grammatical word (this is also known as “compounding” or “root serialization”). In order to describe these constructions, Foley & Olsen (1985) proposed the terms “nuclear SVC” or “complex verb serializing”. Differently, the components in example (7) consist of independent grammatical words.

7. Semantic properties in SVCs

SVCs analyzed in this paper present a semantic structure called by Aikhenvald (2006: 22) “asymmetrical”, since one of the verbs provides the main semantic content and the other modifies the construction as a whole with respect to a specification (Aikhenvald *ibidem*: 30). As pointed out by Lord (1974), the modifying verb (or “minor verb”) is “always in some sense a further development, result or goal” of the modified one (or “main verb”) in the construction.

Minor verbs are generally described as belonging to limited sets, often verbs of motion or position such as ‘go’, ‘come’, ‘give’, ‘take’, ‘rise’, ‘fall’, ‘throw’, ‘put’ (Masica 1976: 142). Such verbs lose their full semantic value and add benefactive or aspectual meaning or valency to the open class verb.

7.1. R-type serialized P and T-type serialized P

On the basis of their semantic functions, SVCs have been grouped into two categories identified by Margetts & Austin (2007): (1) *R-type serialized P* and (2) *T-type serialized P*.

The first class, also known as “give-serialization” (see Green 1974), includes as minor serial verbs ‘give’, ‘show’, ‘submit’, ‘help’, ‘come’ or ‘go’, as shown in Table 2:

GIVE-serialization	V1	Arg	V2	V(n)	Arg	dV
give*	give	-	come		R	x
	give	T	reach		R	x
	give	T	go		T (switch)	x
sell*	sell	T	give		T	
return (give back)	give back	T	give		T	
bring*	take	T	give		T	
	bring	T	go		L	x
	carry	T	go		?	x
	carry	T	come		?	x
send	send	T	give		R	
	send	T	go		L	x
	send	T	come		R	x
throw*	throw	T	go-	give	R	x
put*	put	T	give		R	
buy	buy	T	give		R/B	
build	give	R	build		T	
	build	T	give		B	
tell*	tell-		give		B	
	say	T	go		R	x
teach	give		know		R	
write	stab	T	go-	reach	R	x

Table 2. R-type serialized P

The asterisk in the table indicates that the same three-participant event can be formed by other SVs; the question mark indicates that no example was found with all the three arguments. The second column contains the main predicates of the SVCs, except for the first combination of ‘build’, in which the main verb is V2. In this latter case, the second argument is the recipient, while in other SVCs it can correspond to a theme argument. The third argument is typically a recipient or a locative which includes recipient, possessor and a host of spatial and temporal locations. It may also be introduced by a third SV as in ‘throw’ and ‘write’. The last column indicates the presence of a deictic verb in the construction.

In the following example (9), the function of the minor verb ‘give’ is a pragmatic extension of the SVC:

- (9) *Mí mandá biífi dá hen*
 1SG send letter give 3SG:F
 ‘I have sent letters to her.’ (Saramaccan; Veenstra 1996:107)

V2 increases the number of core arguments by introducing a core recipient argument (or goal-possessor), since the human participant *hen* ‘her’ (*R-type participant*) cannot be expressed as an argument of the verb *mandá* ‘send’ directly.

In example (10) below, ‘give’ denotes the same function, but it is contiguous to ‘go’, which specifies the path of the moving entity (that is, ‘ball’) towards the addressee:

- (10) *Khwaang luukbən pay hay khaw*
 throw ball go give 3SG
 ‘(S)he threw the ball to him.’ (Thai; [p.c.] in Malchukov *et al.* 2007)

In the second category, *T-type serialized P*, or “take-serialization”, a serialized verb, such as ‘take’ or ‘use’, instead, introduces a thematic or instrumental argument (*T-type participant*), as shown in example (11):

- (11) *Kofi fa -li buluku hə-leli Kasi*
 Kofi take-PST book show-PST Kasi
 ‘Kofi showed the book to Kasi.’ (Anyin; Van Leynseele 1975: 197)

As mentioned earlier, the modifying verb does not retain its full semantic value. The verb *fali* ‘take’ becomes semantically depleted to the extent that it no longer indicates physical grasp (or even a separable action)¹², but it assigns a transitive/causative value to V2 *həleli* ‘show’ which introduces the third argument.

T-type serialized P constructions analyzed in this study show a tendency to present the following kind of structures:

TAKE-serialization	V1	Arg	V2-	V(n)	Arg	dV
give*	take	T	go		R	x
	take	T	come		R	x
	take	T	give		R	
	take	T	take-		R	
	take	T	come		T (switch)	x
sell*	sell	T	take		?	
	take	T	sell		?	
bring*	take	T	give	give	T	
	take	T	go		?	x
	take	T	bring		?	
	take	T	come-		R	x
	take	T	go-		R	x
	take	(T)	arrive-		L?	x
	take	T	put.on		L	
throw*	take	T	throw	give	L	
show	take	T	show	give	R	
	take	T	look	go	R	x

Table 3. T-type serialized P

As already illustrated in Table 2, the presence of a directed manner of motion expression in the constructions is, cross-linguistically, one of the most common patterns of verb serialization. In examples (4), (7) and (8), V1 ‘take’, which itself implies no orientation, is followed by the intransitive intrinsically oriented verbs ‘go, motion away from X’ and ‘come, motion toward X’, which have generalized to function as both “valence-increasing devices”, by specifying the path or location of action event.

Minor verbs can also express an aspectual property of the event identified by the major verb. Foley & Olsen (1985) predict that posture verbs, such as ‘lie’, ‘sit’ or ‘stand’, closely follow directional verbs such as ‘come’ and ‘go’ which are the most favored, in being candidates to serialization. Some of the analyzed constructions, particularly those with the three-participant event ‘put’, are formed by posture verbs which have dynamic semantic features in that they signal continuative aspect, as in example (12):

- (12) *Ka -toc amê kê -kô mäsac*
 1SG-put yam 3SG-lie floor
 ‘I put yams on the floor.’ (Jabêm; Bisang 1986: 146)

¹² In these constructions, the ‘take’ verb can become semantically bleached, syntactically defective, and morphologically eroded while a following intransitive verb acquires a transitive/causative reading, like in [he take book come].

V1 designates an action (literally, a physical action carried out on a patient entity) whereas V2 can be interpreted as the resulting state of an entity (literally, a physical resulting state occurring to the patient entity) indicated by the direct object argument of the V1.

8. RRG: the syntactic representations of SVCs

In the first part of the study, we have examined the main aspects which distinguish SVCs expressing three-participant events, with particular attention to their argument realization. In the second part, we will show how RRG may provide a model of clause structure within serialization.

It has been observed that SVs can be joined together to make a complex predicate with a single set of arguments (that is, a *nuclear serialization*) or, alternatively, groups of verbs + inner arguments can be joined in order to form a *core serialization* (being subject to the constraint that the verbs share at least one inner argument).

The representation below illustrates the constituent and operator projection of the simple three-place predicate ‘give’ in the English sentence *Pat gave a book to Kim* and in its Italian and French translations¹³:

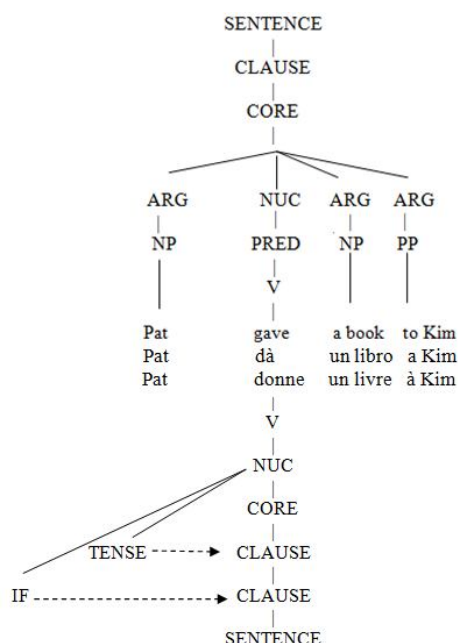


Figure 1. The layered structure of a three-place predicate

The simple predicate is preceded by one argument (the agent ‘Pat’) and followed by two arguments (the theme ‘a book’ and the recipient ‘to Kim’) (Van Valin 2007). The [PP[P+NP]] ‘to Kim’ is classified by RRG as a “core argument-marking” introduced by the marker with no predicative function ‘to’, since the semantics of its argument is a function of the semantics of the verb in the nucleus.

In example (13) below, *mê* ‘come’ (V2) is an intransitive active predicate, and thus it does not add any core argument other than the agent which is, nevertheless, a \emptyset argument

¹³ Haspelmath (2005) classifies the English ditransitive construction as “mixed type”, since it exhibits dative-shift (indirect-object construction, as illustrated in the projection above, and double-object construction, ex. *Pat gave Kim a book*), while Italian and French constructions correspond to indirect-object construction marked by the adpositions *a* and *à*, respectively.

coreferential with the agent argument of V1. Consequently, the composite nucleus and the single set of arguments are grouped in a single core¹⁴:

- (13) *Rri ve mê arròò*
 3PL take come water
 ‘They brought water.’ (Tinrin; Osumi 1995: 213)

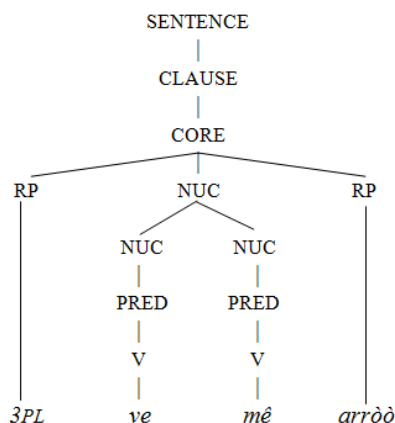


Figure 2. Nuclear SVC

In example (14) below, both verbs *pan* ‘take’ (V1) and *bay* ‘give’ (V2) are controlled by two cores which constitute a core SVC. Their arguments are selected independently, although there does need to be coreferentiality between the subjects of both serial verbs, or between the object of one verb and the subject of the other. In fact, V2 only has the recipient-argument, since its agent and its theme are coreferential with those of V1 by means of the core juncture:

- (14) *Emil pan liv la bay Mari*
 Emil take book DET give Mary
 ‘Emil gave the book to Mary.’ (Haitian Creole; Andrews & Manning 1999: 105)

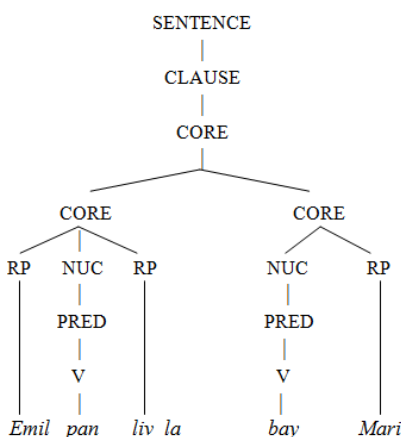


Figure 4. Core SVC

¹⁴ These constructions have the same appearance as compound verbs. Hence, it is sometime not easy to distinguish clearly between them.

The constructions analyzed in (13) and (14) above are formed by two serial verbs, but several examples in the sample show other structures with three SVs (see *Appendix*). In example (15) below, the addition of a third predicate involves a constituent projection, in which the nuclear juncture of the contiguous predicates *ba* ‘go’ (V2) and ‘give’ (V3) is linked to the verb *ma* ‘take’ (V1) at the core level:

- (15) *Malí ma dyana ba da pe-déli*
 Mary take banana go give father
 ‘Mary brought a banana to her father.’ (Fa d’Ambu; Post 1995: 201)

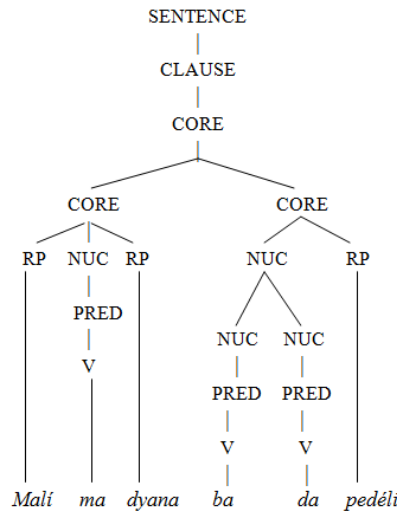


Figure 5. Nuclear and core SVC

In example (16) below, the pronominal argument ‘you’ cannot be considered as having the same semantic-syntactic function as the internal arguments ‘Mary’ and ‘father’, in examples (14) and (15), respectively. ‘You’ is different from both an argument-marking (like ‘give to’) and a peripheral adjunct, since the logical structure of the transfer verb ‘send’ provides an “optional” information describing the spatial goal of the intended action. Therefore, the pronominal argument rather corresponds to a core argument-adjunct [AAJ] (also called core semi-argument, or non-nuclear argument), since the omission of V2 ‘give’ and its argument-adjunct, that is the benefactive argument ‘you’, make a sentence with only the simple predicate ‘send’ means ‘I have sent letters’:

- (16) *Mí mandá biífi dá hen*
 1SG send letter give 3SG:F
 ‘I have sent letters to her.’ (Saramaccan; Veenstra 1996:107)

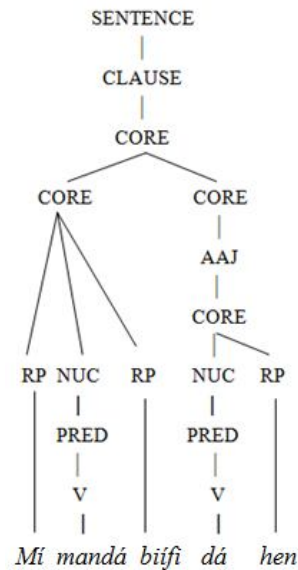


Figure 6. Argument-adjunct in SVC

Another case of core argument-adjunct is the purposive argument introduced by action-process benefactive verbs ‘give’, ‘accept’, ‘buy’, ‘sell’, etc. and conveyed by the English preposition ‘for’, as shown in the following sentence:

- (17) *Breno* $\varphi = \text{dé}$ *ké=n* ϕyi $\phi sama$
 Breno 3SG.SCL=buyFE give=FE him shirt
 “Breno bought a shirt for him.” (Degema; Kari 2003: 280)

8.1. The syntactic representations of non-SVCs

SVCs have been compared with other multiverbal constructions, in particular those forming a clause chain. The differences between them (see note 9) are reflected in the constituent projection. Taking the previous example (3), repeated below (18), we obtain the following syntactic representation:

- (18) *Hama m i-me da mo -mi!*
 hammer take-SS 1SG give:2SG.IMPER-SG.OR
 ‘Give me the hammer.’ (Koiari; Dutton 1996: 19)

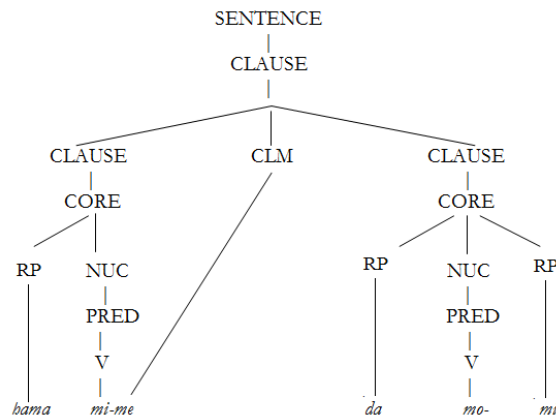


Figure 7. Clause chaining

The projection shows how the two cores do not merge into one core, but are linked by a core-level clause-linkage marker, or complementizer (Van Valin 2005: 205), which contextually can also indicate a temporal semantic relation between both nuclei. Consequently, predicates *mi-* ‘take’ (V1) and *mo-* ‘give’ (V2) are two distinct nuclei which do not express subevents of a single macro-event, but they rather denote separate actions.

9. RRG: the semantic representations of SVCs

In the RRG’s system of lexical decomposition, simple three-place predicates contain abstract elements, like BECOME operator which typically characterizes ACCOMPLISHMENT logical structures, but also the predicative element **do’**. The corresponding logical structure (LS) of three-place predicates and their related arguments is typically displayed as follows: [**do’**(x, Ø) CAUSE [BECOME **predicate’** (y, z)].

The mapping between the semantic representations of three-place predicates and the morphosyntactic expressions of their arguments is mediated by the assignment of two macroroles (MR), the actor and the undergoer, to the arguments¹⁵. The relation between MRs and LS argument positions is captured in the Actor-Undergoer Hierarchy (AUH), which ranks thematic roles between MRs (Van Valin 1993: 42, 2005: 54, 60).

As described by Van Valin (2007), the third argument of a simple three-place predicate corresponds to a non-macrorole (NMR), since not all languages allow the realization of the three arguments in a single core. In the English sentence *Emil gave a book to Mary*, the recipient-possessor ‘Mary’ is a NMR oblique core argument, since it is adpositionally marked, differently from the agent ‘Emil’ and the theme ‘a book’ which undertake the semantic macroroles of actor (MR1) and undergoer (MR2) respectively (Van Valin 2005: 54), as you can see in Figure 8(a) below:

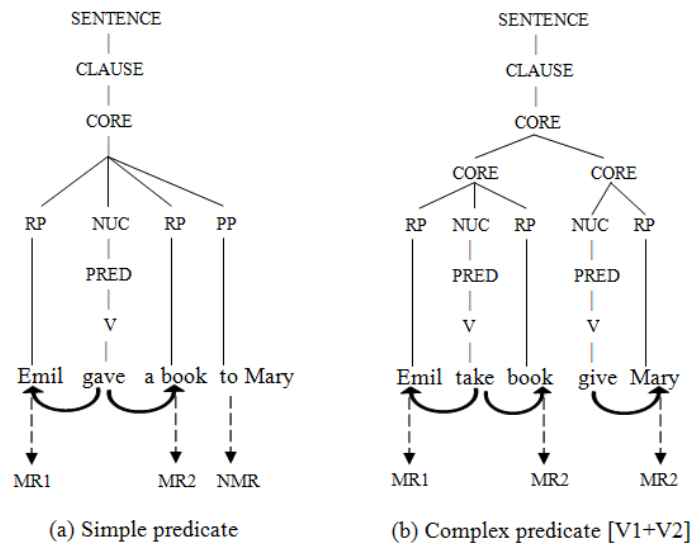


Figure 8. RRG Assignment of MR

In the case of serializing languages, none of the serial predicates presents more than two MRs: on the one hand, V1 introduces MR1 (the actor) and MR2 (the undergoer1) and, on the other hand, V2 introduces another MR2 (the undergoer2). However in Figure 8, we

¹⁵ The “actor” and the “undergoer”, proposed by RRG, respectively subsume a number of specific thematic relations. The former can refer to the agent or the experience and the latter to the experiencer, the recipient, the stimulus, the theme or the patient.

should observe that the NMR of the simple predicate can instead correspond to a second MR in SVC. In fact, the presence of SV2 adds a second nucleus which is controlled by the second core (see Figure 8(b)).

The mapping from semantic representation to syntactic representation of SVCs is a complex production process which allows us to reconstruct the procedures of interaction between predicate arguments and, in particular, to motivate the absence of some of them in terms of argument sharing. Figure (9) below illustrates the tentative identification of the lexical-syntactic interface of a SVC:

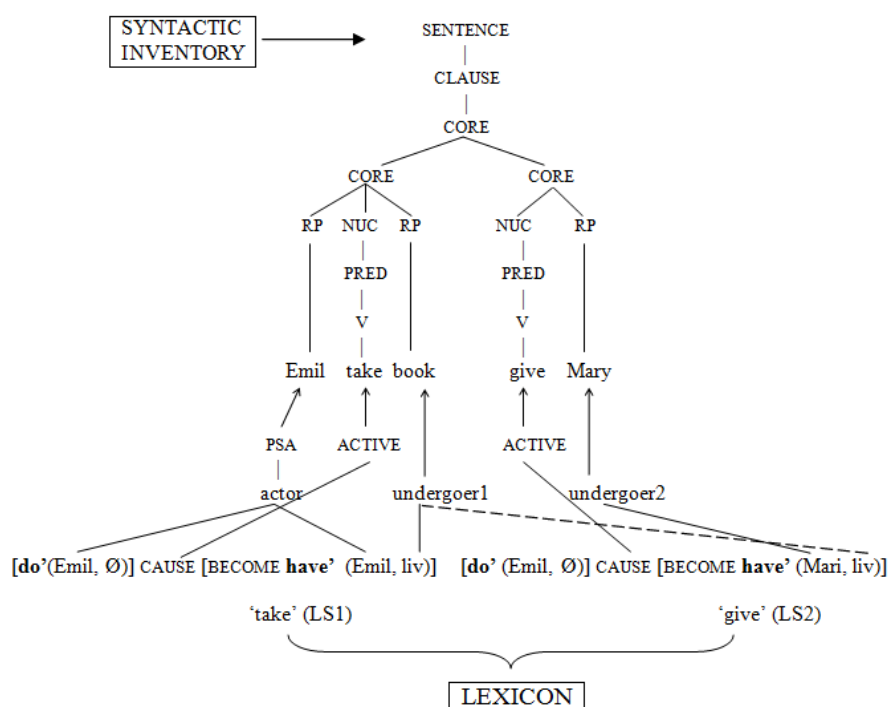


Figure 9. Complex linking from semantics to syntax

The SVC is mapped onto a semantic representation which is different from that of a simple three-place predicate. Both verbs ‘take’ and ‘give’ in the SVC lead us to the combination of two LSs, which can be literally translated into LSs $[\text{do}'(x, \emptyset)] \text{ CAUSE } [\text{BECOME have}'(x, y)]$ and $[\text{do}'(x, \emptyset)] \text{ CAUSE } [\text{BECOME have}'(y, z)]$, respectively.

The effector (‘Emil’) and the possessed (‘book’) of LS2 are represented as co-indexed variables referring to the corresponding arguments of LS1. The latter is transferred by the actor acting¹⁶ in LS1 (Baker 1989; Collins 1997). The absence of the former in the second part of the SVC is motivated by the function that it talks in the whole syntactic structure.

The actor is, in fact, encoded as the Privileged Syntactic Argument (PSA), which has a double control: it controls both verb agreement on the matrix verb, and the interpretation of the missing argument in the linked core, canonically the *pivot* of the construction (Van Valin 2005: 95). Figure (10) illustrates a case of subject control, since the controller is the subject-actor of the matrix core:

¹⁶ The sample of examples in *Appendix* shows SVCs containing a moved macrorole transferred by both an actor acting (i.e. *take*, *bring*) and an actor remaining stationary (i.e. *throw*, *send*) (Foley & Olsen 1985; Déchaine 1986; Backer 1989).

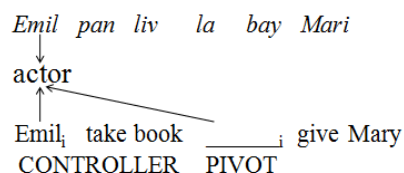


Figure 10. PSA: subject control

Differently, Figure (11) below shows a switch-SVC in which the controller-argument is the object of the matrix core, that is the undergoer of V1:

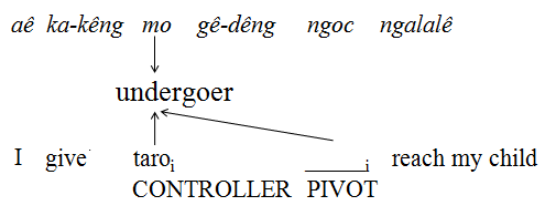


Figure 11. PSA: object control

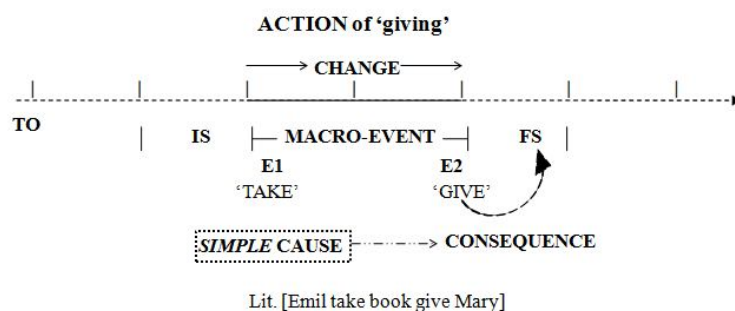
The syntactic relations *controller-pivot* between predicates can derive SVCs from both coordinate sentences and a matrix and a constituent (embedded) sentence (Williamson 1965). SVCs actually profile a particular network of syntactic interactions called “co-subordination nexus” (Olsen 1981; Foley & Van Valin 1984, 1985). The sequence of each part of SVCs are neither in a subordinate juncture-nexus, nor in a true coordinate relationship to each other, although predicate events are situationally interdependent and ranked in terms of the syntactic tightness involving the linking of whole SVC (see the RRG’s Syntactic Relation Hierarchy) .

10. The notion of eventhood in SVCs

In the last part of the present paper, we propose a possible elaboration of the interclausal semantic relations between predicate events and structural elements of SVCs, with reference to RRG methods for exploring the semantics and pragmatics of discourse (Van Valin and LaPolla 1997).

The understanding of crosslinguistically variable and complex events, expressed and reported in and with a SVC, is not based on physical time and motion alone, but also on cognitive and conventional units. For this reason, events cannot be discussed as detached from the individual language and its speakers. In other words, intentions, purposes and further reasons of an agent are carried out according to conventions and pragmatic rules known by the language users of a speech community. In fact, syntactic constructions of SVCs should not only be characterized in terms of their internal structure and the meaning assigned to them, but also in terms of pragmatic constraints which determine whether a sequence of core be expressed in one clause or several clauses.

Figure (12) below provides a tentative interpretation of the complex three-place predicate event ‘give’:



TO: Temporal Ordering; IS: Initial State; FS: Final State; E1: First Event; E2: Second Event

Figure 12. Macro-event representation of a SVC

The action of ‘giving’ is expressed by two events, or better subevents, which are linearly ordered and perceived as component events of a macro-event¹⁷. The macro-event consists of the combination of fragmented subevents, which may in other situations occur independently, corresponding to possible worlds or states of affairs. Subevents are expressed by cores, and relations between them range over cores as a “whole”.

The macro-event involves a change of state which unfolds over time between an initial state and a final state. We can speak of a “continuous flux of subevents” following each other in time, and the relation between them may have two semantic interpretations: (1) either a sequential interpretation as in ‘Emil took the book (*and*) gave it to Mary’, or (2) a dependent interpretation as in ‘Emil took the book (*to*) give it to Mary’. In the former case, the first event ‘took’ is terminated before the second verb ‘gave’ happened, while in the latter case the second event ‘give’ is the purpose of the first event ‘took’. Then, we gather that subevents are not only linearly ordered, but also hierarchically ordered¹⁸. In the above example, the notion involved is that of “causation”.

Approaching the issue from a text linguistic perspective, van Dijk (1977) and de Beaugrande & Dressler (1980) presented partial catalogue of such interclausal relations which can describe, broadly speaking, the event of a SVC. The action of ‘giving’ in SVCs can correspond to an interclausal coherent relation denoting a “cause-of”. The first event (E₁) is the cause of the second event (E₂), since E₁ creates the necessary conditions for E₂. Then, V2 can be interpreted as the further development, the consequence or the result, while V1 is intended as the sufficient condition for the successfulness of the (main) act¹⁹.

Figures (12) and (13) illustrate two possible kinds of causal relations in ‘giving’ SVCs. In the first representation (12, above), the causal relation consists of a predicate event ‘take’ which causes the next following event ‘give’. In the second one (13, below), the causal relation rather consists of a subsequence of (causally related) events [take+go], which still causes the same following event ‘give’. The difference between the two actions of ‘giving’ lies in the consequence event type. In Figure (12), we observe that the consequence of the

¹⁷ For a deeper study on principles of event segmentation in languages (and in SVCs), see in particular Bohnemeyer *et al.* (2007) who, building on Talmy’s work, introduce the term macro-event property (MEP: *the predictor of form-to-meaning mapping properties*) in a recent, large scale, cross-linguistic study of event segmentation (in particular for motion-event segmentation).

¹⁸ We observe that there is no morpho-syntactic markers linking verbs to specific interclausal semantic relations hierarchy, as in the Koiari clause chain, in which the presence of the complementizer (SS) indicates a temporal semantic relation between the two nuclei (Van Valin 2005: 205).

¹⁹ We observe strict event iconicity in which cause always precedes result. Nevertheless, grammatical order of elements can also not correspond with temporal order, as in the case of predication combinations expressing simultaneous aspects of a single event.

causing event ‘take’ corresponds to the subevent ‘give’, which in turn overlaps with the final state (FS) of the ‘giving’ action.

Nevertheless, the action of ‘giving’ can also be triggered by a complex cause which is constituted by two SVs, ‘take’ and ‘go’, as shown in Figure (13):

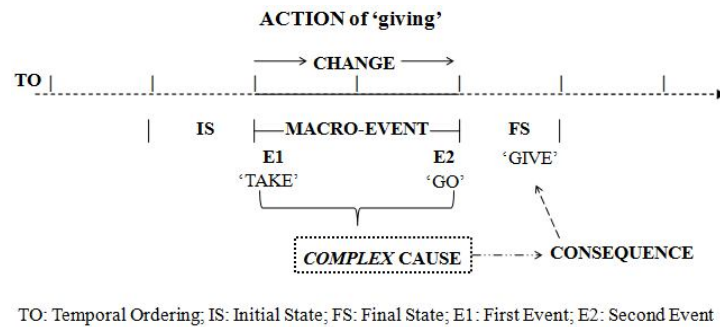


Figure 13. Macro-event representation : *explicit* Spatial Transfer object

Differently from the ‘giving’ action represented in Figure (12), the second subevent predicate ‘go’ is not the consequence of a ‘taking’ event, but it is rather the second cause necessary and sufficient for the consequence of ‘giving’ to occur. Therefore, the ‘giving’ result corresponds to the final state of the action which, in this case, does not overlap with the second event.

We can observe, then, that this kind of complex cause is formed by a second event predicate, which encodes a deictic notion specifying the direction with respect to speech act participants. The oriented verb can also be the predicate ‘come’, as follows:

- (19) *Nèk ʔaoy siəvphɿu mək khnom*
 2SG take book come 1SG
 ‘You give me a book.’ (Khmer; Jacob 1968: 78)

The second predicate ‘come’ introduces the third argument ‘me’, since the agent and the theme are introduced by the first verb ‘take’. Therefore, the agent controls both serial predicates. Nevertheless, the action can also be performed by more than one agent. Several SVCs in *Appendix*, like the ones below in (20) and (21), indicate a course of actions where each agent accomplishes his own acts, but where the acts are mutually related. The best example of interaction event is the switch SVC, in which the macro-event is performed by both actor and undergoer of V1. In the SVC exemplified in (20), the communication verb ‘address’ is formed by the two predicates ‘speak’ and ‘go’. The second one involves an abstract transfer in which the words are what metaphorically moves (lit. ‘I speak a word (and) it goes to the people’):

- (20) *Ja-sôm bing ê -ndêng lau*
 1S-speak word 3SG-go people
 ‘I address word(s) to the people.’ (Jabêm; Durie 1988: 12)

The complex cause [speak+go] has as consequence the Final State (FS) in which the hearer receives the message from the speaker.

In example (21), the three-place complex predicate ‘reveal’ is expressed by a give-serialization in which the path verb ‘exit’ indicates the direction resulting from interaction between the path and the outside world:

- (21) *Labele [fó sai] lia ne'e!*
 NEG.can give exit voice this
 'You can't reveal his matter!' (Tetun Dili; Hajek 2006: 242)

Subevents of SVCs can then represent sequential states of affairs, with or without any temporal overlap, in which the first event is intentionally performed in order to realize the final consequent event, so that the macro-event is fully successful. Referring to RRG's Interclausal semantic relations, the nexus-types, described above, are used to express relations having reference to the so-called "sequential states of affairs" and "purposive interclausal semantic relations" (Van Valin 2005: 206-207).

11. Summary and conclusions

SVCs analyzed in the present paper can be distinguished between SVCs formed by predicates belonging to the semantic category of 'giving' (namely, *R-type serialized P*) and those formed by predicates belonging to the semantic category of 'taking' (namely, *T-type serialized P*). The primary semantic functions of additional serial verbs are to increase the verbal valency, so that the third argument can be added, and to specify aspectual properties, as, for example, the continuative aspect.

It has been observed that SVs can syntactically be either contiguous, without any constituents between predicates or non-contiguous. In the latter constructions, each verb has its own core arguments selected, with at least one of the arguments coreferential between them.

The application of the RRG framework to the analysis of data has provided an exhaustive description of syntactic argument structure in SVCs. SVs and arguments have been classified as nuclear, core and mixed constructions with cosubordinate nexus-types. Furthermore, SVCs syntactic projections have been distinguished from those of simple three-place predicates. The latter constructions have recipient-possessor arguments as NMR oblique core argument, differently from SVCs in which SVs can introduce both MR1 (the actor) and MR2 (the undergoer1) and MR2 (the undergoer2). In fact, the presence of the third argument in a SVC has been identified as another macrorole introduced by the second nucleus.

Then, the RRG's complex linking projection from semantic to syntax provides a semantic representation of the SVC which is different from that of a simple three-place predicate, since the SVC can map the combination of two LSs. RRG also permits to identify the possible semantic interclausal relations between both LSs, which represent a type of macroevent.

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Appendix: The sample

(a) *Agent causes recipient to receive theme*

Verbs of Change of Possession: Give Verbs

‘to give’

- (1) Khmer (Austro-Asiatic, Mon-khmer; Cambodia; Jacob 1968: 78)
Khnom ʔaoy siəvphxu txu nɛk
 1SG take book go 2SG
 ‘I give you a book.’
- (2) Khmer (Austro-Asiatic, Mon-khmer; Cambodia; Jacob 1968: 78)
Nɛk ʔaoy siəvphxu mɔ:k khnom
 2SG take book come 1SG
 ‘You give me a book.’
- (3) Haitian Creole language (in Andrews & Manning 1999: 105)
Emil pan liv la bay Mari
 Emil take book DET give Mari
 ‘Emil gave a book to Mary.’
- (4) Pijin (English Creole; Solomon Islands, in Crowley 2002: 232)
Hem givim kam buk
 3SG give come book
 ‘(S)he gave the book (to someone).’
- (5) Twi (Niger-Congo, Akan; Ghana; Stewart 1963: 146, Foley & Olsen 1985: 54)
ɔ-de sika nó maa me
 3SG-take money he give me
 ‘He gave me the money.’
- (6) Anyi (Niger-Congo, Kwa; Ghana; Van Leynseele 1975: 201, in Foley & Olsen 1985: 54)
Kòfì fà bùlúkú-ɔ̃ fá-mā Kàsí
 Kofi take book-DET take-give Kasi
 ‘Kofi gave the book to Kasi.’
- (7) Jabêm (Austronesian, Malayo-Polynesian; Papua New Guinea; Bradshaw 1993: 151)
Âê ka-kêng mo gê-dêng ngoc ngalalê
 1S 1SR-give taro 3SR-reach GEN1S child
 ‘I gave taro to my child.’
- (8) Sakao (Austronesian, Malayo-Polynesian; Vanuatu; Durie 1988: 10)

Me -ke -r -lam

3SG-take-ri-come

‘He handed it hither.’ (lit. he took it and it came)

- (9) Jabêm (Austronesian, Malayo-Polynesian; Papua New Guinea; Durie 1988: 12)

A -kêng òbo gê -dêng napalê gê -jà

1PL:INCL.-give cloth 3SG-to boys 3SG-go

‘We give cloth(s) to the boy.’

‘to sell’

- (10) Yoruba (Niger-Congo, Benue-Congo, Defoid; Nigeria; Lord 1993: 35)

ó tà -á fún mí

3SG sell-3SG give 1SG:OBJ

‘He sold it to me.’

- (11) Wolaitta (Afro-Asiatic, Omotic; Ethiopia; Amha & Dimmendaal 2006: 326)

ʔí ba keett -áa baizz-í ʔekk-iisi

3SG:NOM LOG.PRO house-M:ASS sell-CONV take-3MSG:PERF

‘He sold his house.’

- (12) Sranan (Suriname Creole English, Suriname; Muysken & Veenstra 1995)

Mi teki fisi seri

1SG take fish sell

‘I sold the fish.’

‘to give back’

- (13) Thai (Tai-Kadai, Kam-Tai; Nichols & Woodbury 1985: 55)

dèk khǐn naysǐi hây khruu

boy give-back book give teacher

‘The boy gave back the book to the teacher.’

‘to promise’

- (14) Jaminjung (Australian, Jaminjungan; Australia; Schultze-Berndt 2000)

[Baramaj gani-yu] lambarra-ni.

promise 3SG: 3SG-say:PST father-in-law-ERG

‘He promised it to him, (i.e. to give his daughter), the father-in-law.’

Verbs of Sending and Carrying: Send verbs; Bring and Take

‘to bring’

- (15) Mooré (Niger-Congo, Gur; Burkina Faso; Givón 1975: 58)

A dika lidgã n kô (a) Kulgã

he take money CONS. give (it) Kulga

‘(He) brought money to Kulga.’

- (16) Sranan (Suriname Creole English; Suriname; Jasen *et al.* 1978, in Dechert 1989: 19)

Roy e tyari a pikin go na oso

Roy PST bring DET child go LOC house

‘Roy brought the child to house.’

- (17) Tinrin (Austronesian, Malayo-Polynesian; New Caledonia; Osumi 1995: 213)

Rri ve mê arròd

3PL take come water

‘They brought water.’

- (18) Kana (Niger-Congo, Benue-Congo; Nigeria; Ikoro 1995: 316)

Bàrilè èsúā lō kpá núā

Barile take SPEC.SG book bring:INST

‘Barile has brought the book.’

- (19) Bamileke (Niger-Congo, Bantu; Camerun; Hyman 1971, in Kroeger 1999: 235)

á ká lálh càk usá? ha a

3SG PST take pot come give 2SG

‘He brought me the pot.’

- (20) Fa d’Ambu (or Annobonese) (Portuguese Creole, Equatorial Guinea; Post 1995: 201)

- Malí ma dyana ba da pe-déli*
Mary take banana go give father
'Mary brought banana to her father.'
- (21) Paicî (Austronesian, Malayo-Polynesian; New Caledonia; Rivierre 1983, in Ozanne-Rivierre 2004:335)
ē pá tēpà-ri pā ī ānyē dari Ikii
3SG take arrive-TR go DET fire house Ikii
'She brings the fire to Ikii's house.'
- (22) Igede (Niger-Congo, Benue-Congo; Nigeria; Bamgbose 1974, in Awoyale 1988: 29)
Ahi hū olo chu
1PL take load put.on.head
'We carried the load (on our heads).'
- (23) Èfik (Niger-Congo, Benue-Congo; Nigeria; Welmers 1968, in Awoyale 1988: 29))
Aje men okpokoro oko di
take table that come
'Aje brought the table.'
- (24) Thai (Tai-Kadai, Kam-Tai; Diller 1985: 67, in Nichols & Woodbury 1985: 25)
Sùk zaw máy maa
Sook take wood come
'Sook brought the wood.'
- (25) Yoruba (Niger-Congo, Benue-Congo, Defoid; Nigeria; Stahke 1970: 61, in Nichols & Woodbury 1985: 25)
Mo mú ìwé wá ilé
I take book come home
'I brought a book home.'
- (26) Tok Pisin (Creole language, Pacific; Papua New Guinea; Foley & Olsen 1985: 48)
Em i⁵ karin diwai i⁵ go
he carry wood go
'He carried the wood away.'
- (27) Tok Pisin (Creole language, Pacific; Papua New Guinea; Foley & Olsen 1985: 48)
Em i karim diwai I kam
he carry wood come
'He brought the wood.'
- (28) Nupe (Nupe-Gware, Kwa; Kwara, Niger, Benue, Nigeria; George 1976: 63-64, in Foley & Olsen 1985: 48)
Tsoda lá egó wo
Tsoda take axe came
'Tsoda brought the axe.'
- (29) Lewo (Austronesian, Malayo-Polynesian; Vanuatu; Early 1993: 69)
A-pure pami Mapena Øtalova
3PS-pull come.up Mapena 3SS-marry
'They brought her to marry into Mapena.'
- (30) Kristang (Portuguese Creole; Malaysia, Singapore; Forman 1993: 175)
Yo ja tizé isti floris da ku eli
1S PF bring this flower give R 3S
'I brought this flower for her.'
- (31) Sakao (Austronesian, Malayo-Polynesian; Vanuatu; Durie 1988: 10)
me -ke -lam
3SG-take-come
'He brought it.'
- 'to take'**
- (32) Mwotlap (Austronesian, Malayo-Polynesian; Motalava; François 2004: 125)
no ma -van tēy na -gasel mino
1SG PST-go keep DET-knife 1POSS:SG

'I took the knife (with me).'

- (33) Nakanai (Austronesian, Malayo-Polynesian; Papua New Guinea; Durie 1988: 16)

ei apuli-a so-luma la mautu

3SG take-3SG go-home the village

'He took her back to the village.'

'to send'

- (34) Saramaccan (Portuguese Creole; Suriname, French Guiana; Veenstra 1996:107)

Mí mandá biífi dá hen

1SG send letter give 3SG:F

'I have sent letters to her.'

- (35) Thai (Tai-Kadai, Kam-Tai, Natchanan Yaowapat [p.c.] in Malchukov *et al.* 2007)

Song cotmaay pay Krungthep

send letter go Bangkok

'(S)he sends a letter to Bangkok.'

- (36) Paamese (Austronesian, Malayo-Polynesian; Vanuatu, in Crowley 2002: 178)

Kisa-n tasele-sien he-mai venau

2SG-FUT:DIST-send INDEF-message 3SG:FUT:DIST-come DAT:1SG

'You will send a message to me.'

- (37) Keo (Austronesian, Malayo-Polynesian; East Nusantara, Baird 2008: 58)

Peter ngatu sura ti'i nga'o

Peter send letter give 1SG

'Peter sent a letter to me.'

Verbs of Throwing: Throw verbs

'to throw'

- (38) Jamaican (English Creole, Veenstra 1992: 191)

Im tek stuon fling ina di waata

3SG take stone throw in:LOC water

'He threw the stone in the water.'

- (39) Thai (Tai-Kadai, Kam-Tai, Natchanan Yaowapat [p.c.] in Malchukov *et al.* 2007)

Khwaang luukbən pay hay khaw

throw ball go give 3SG

'(S)he threw the ball to him.'

(b) Agent causes theme to move to location

Verbs of Putting: Put Verbs

'to show'

- (40) Baule (Niger-Congo, Kwa; Côte d'Ivoire, southwestern Ghana; Creissels 1977: 240)

à fa í swā n àklè mĩ

3SG-take 3POSS:SG house DET show 1SG

'He has showed me his house.'

- (41) Taba (Austronesian, Malayo-Polynesian; Bowden 2008: 79)

N-ot-ik si l-a-doi

3SG-take-APPL[give] 3PL 3PL-ACT-look

'She showed it to him.'

- (42) Anyin (Niger-Congo, Kwa; Côte d'Ivoire, southwestern Ghana; Van Leynseele 1975:197)

Kofi fa-li buluku hə-leli Kasi

Kofi take-PST book show-PST Kasi

'Kofi showed the book to Kasi.'

- (43) Haitian Creole language (in Law e Veenstra 1992: 190)

Jan pran liv la montre Mari

John take book DET show Mary

'John showed the book to Mary.'

‘to put’

- (44) Yoruba (Niger-Congo, Benue-Congo, Defoid; Nigeria; Lord 1993:35)
Mo dé filà fún
1SG put hat give 3SG
‘I put the hat on his head.’
- (45) Kele (Austronesian, Malayo-Polynesian; Papua Nuova Guinea; Ross 2004: 304)
Yu u-ru pálet i-so dta-n kéaw
S:S S:1S-put plate S:3S-lie on-P:3P table
‘I put the plate on the table.’
- (46) Jabêm (Austronesian, Malayo-Polynesian; Papua New Guinea; Bisang 1986: 146-147)
Ka-toc amê kê-kô mäsac
1SG-put yam 3SG-lie floor
‘I put yams on the floor.’

(c) *Agent intends to cause recipient to receive theme*

Verbs of Change of Possession: Verbs of Obtaining (Get Verbs)

‘to buy’

- (47) Gã (Niger-Congo, Kwa; Ghana; McWhorter 1990: 11)
Mi he nook mi hã le
1SG buy something 1SG give 3SG:F
‘I bought something for her.’
- (48) Degema (Niger-Congo, Atlantic-Congo; Nigeria; Kari 2003: 280)
Breno ϕ= dé ké=n óyi ósama
Breno 3SG:SCL=buyFE give=FE him shirt
‘Breno bought a shirt for him.’

Verbs of Creation

‘to build’

- (49) Vietnamese (Austro-Asiatic, Mon-khmer, Viet-Muong; Liem 1979: 57)
Tā gěi wǒ zào-le yì dōng fángzi
3SG give 1SG:OBJ build-asp DET CL house
‘(S)he built an house for me.’
- (50) Keo (Austronesian, Malayo-Polynesian; East Nusantara; Baird 2008: 60)
Ja’o kéma dapu ti’i ine
1SG build kitchen give mum
‘I built a kitchen for mum.’

‘to write’

- (51) Jabêm (Austronesian, Malayo-Polynesian; Papua New Guinea; Bradshaw 1993: 148)
Na-so pepa ni-wesa ni-ndenga nanggi lunggewe
IR1S-stab paper IR3S-go IR3S-reach GEN1S sister
‘I’ll write a letter to my sister (far away).’

(d) *Agent acts to communicate information to recipient*

Verbs of Communication: Verbs of Transfer a Message

‘to tell’

- (52) Kalam (Trans New Guinea, Madang; Papua New Guinea; Lane 1991: 117)
...nbep ag-ñ-ngab-al
2SG:OBJ say-give-FUT-3PL
‘...they will tell you (this).’
- (53) Twi (Niger-Congo, Kwa; Ghana; Riis 1854: 30, in Nichols & Woodbury 1985)
Mi-ka asem mi-kyer no
1SG-speak word 1SG-show 3SG
‘I said him something.’
- (54) Loniu (Austronesian, Malayo-Polynesian; Papua New Guinea; Hamel 1993: 117)

Iy ipwey ime ete yó
 3S R3S-say-it R3S-come AG 1S
 'He told me.'

- (55) Eipo (Trans New Guinea; Indonesia; Heeschen 2008: 155)

Nulkna ton nuk-areb-ma-ki-n
 fairy tale one tell-give-DUR-you-1SG:PRES
 'I am telling you (for you) another fairy tale.'

- (56) Jabêm (Austronesian, Malayo-Polynesian; Papua New Guinea; Durie 1988: 12)

Ja-sôm bing ê-ndêng lau
 1S-speak word 3SG-go people
 'I address word(s) to the people.'

- (57) Tetun Dili (Austronesian, Malayo-Polynesian; East Timor; Hajek 2006: 242)

Labele [fó sai] lia ne'e!
 NEG.can give exit voice this
 'You can't reveal his matter!'

'to teach'

- (58) Tariana (Arawakan, Maipurean; Brazil; Aikhenwald 2006 : 188)

Wa-yarupe-nuku du-enipe-nuku [du-sa du pala-na]
 1PL-thing/language-TOP.NON.A/S 3SG:NF-children-TOP.NON.A/S 3SGF-
 speak 3SGF-put-PST:REM:VIS
 'She taught our language to her children.'

- (59) Taba (Austronesian, Malayo-Polynesian; Bowden 2008: 90)

Alho n-o-tik m-unak?
 who 3SG-get-APPL(give) 2SG-know
 'Who taught you?/Who let you know?'

How to Find Serial Verbs in English: An RRG Analysis of Phase Verb Constructions

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ABSTRACT

Serial verb constructions (SVCs), are found in Creole languages, in the languages of West Africa, Southeast Asia, Amazonia, Oceania, and New Guinea. In this paper we examine a set of verbal complexes in English called phase verb constructions (PVCs) in *Collins Cobuild English Grammar* (1990:184-193) from a Role and Reference Grammar perspective and compare them with SVCs. Specifically, the set of syntactic and semantic properties of SVCs provided by Kroeger (2004:229-230) are used as a point of comparison. We demonstrate that PVCs have all of the characteristic syntactic and semantic properties of SVCs.

KEYWORDS: serial verb construction, phase verb construction, language typology, macro-event property.

1. Introduction

In this paper we examine a set of verbal complexes in English called phase verb constructions (PVCs) in *Collins Cobuild English Grammar* (1990:184-193) from a Role and Reference Grammar (RRG) perspective and compare them with serial verb constructions (SVCs). We demonstrate that PVCs have all of the characteristic syntactic and semantic properties of prototypical SVCs.

Serial verb constructions can occur where the shared argument in the verb series is only the subject, as illustrated in (1).

- (1) SVCs with same subjects:
- a. Yoruba (Trask, 1993) (West Africa)
ó mú ìwé wá
3sg took book came
'He brought the book.'
 - b. Cantonese (Matthews and Yip, 1994:143) (S. E. Asia)
bātyùh ngóhdeih heui tái hei
rather 1pl go see film
'Let's go and see a film.'
 - c. Tok Pisin (Verhaar, 1995:100) (Papua New Guinea)
dispela pisin i-flai i-go na i-no kam bek
this bird fly go and not come back
'This bird flew away and didn't come back.'
 - d. Seimat (Wozna and Wilson, 2005:54-59) (Austronesian: Pacific)
laha apuha kak pax-ai waliko
3pl meet speak look-TRANS something
'They met, spoke and looked at things.'

Serial verb constructions can also occur where the shared argument in the verb series functions as object of the first verb and notional subject of the second linked verb. Examples are given in (2) from the same languages illustrated in (1).

(2) SVCs with different subjects:

- a. Yoruba (Bamgboṣe, 1974; tone not shown) (West Africa)
 - olu *ti* ɔmɔ naa *šubu*.
 - Olu push child the fall
 - ‘Olu pushed the child down.’ (lit. ‘Olu pushed the child and it fell.’)
- b. Cantonese (S. E. Asia)
 - ngóh *diu* goh bòh *lohk heui*
 - 1sg throw CL ball down go
 - ‘I threw the ball down.’ (lit. ‘I threw the ball and it went down.’)
- c. Tok Pisin (Papua New Guinea)
 - ol *i-sutim* pik *i-dai*
 - 3pl shoot.TRANS pig die
 - ‘They shot the pig dead.’ (lit. ‘They shot the pig and it died.’)
- d. Seimat (Wozna and Wilson, 2005:57) (Austronesian: Pacific)
 - ti ipong nga *tahuni ha-paxe*
 - at night 1sg smoke CAUS-dry
 - ‘At night I dried (the pandanus) by smoking it.’ (lit. ‘At night I smoked the pandanus and caused it to dry.’)

Towards defining an SVC, Aikhenvald (2006) says: “A serial verb construction (SVC) is a sequence of verbs which act together as a single predicate, without any overt marker of coordination, subordination, or syntactic dependency of any sort. Serial verb constructions describe what is conceptualized as a single event. They are monoclausal; their intonational properties are the same as those of a monoverbal clause, and they have just one tense, aspect and polarity value. SVCs may also share core and other arguments. Each component of an SVC must be able to occur on its own. Within an SVC, the individual verbs may have same, or different, transitivity values.” In addition Aikhenvald (2006:1) says SVCs are widespread in Creole languages, in the languages of West Africa, Southeast Asia (Chinese, Thai, Khmer, etc.), Amazonia, Oceania, and New Guinea. But Dixon (2006) adds that while SVCs are found in perhaps one-third of the languages of the world, there appear to be none in Europe or north or central Asia, and rather few in North America or Australia.

Kroeger (2004:229-230) shows that prototypical SVCs have the following syntactic and semantic properties:

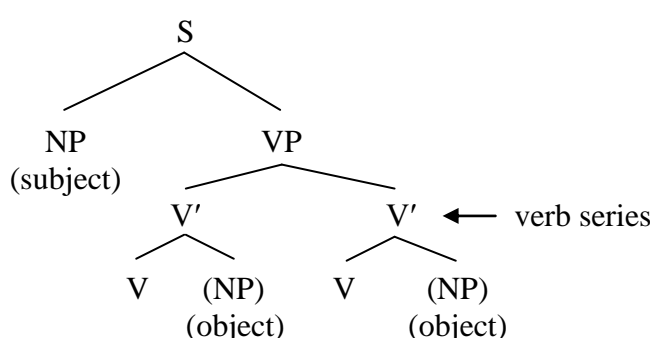
(3) Characteristic properties of SVCs:

- a. A prototypical SVC contains two or more morphologically independent verbs within the same clause, neither of which is an auxiliary.
- b. There are no conjunctions or other overt markers of subordination or coordination separating the two verbs.
- c. The serial verbs belong to a single intonation contour, with no pause separating them.
- d. The entire SVC refers to a single (possibly complex) event.
- e. A true SVC may contain only one specification for tense, aspect, modality, negation, etc., though these features are sometimes redundantly marked on both verbs.

- f. The two verbs in the SVC share at least one semantic argument.
- g. Obligatory non-coreference: a true SVC will not contain two overt NPs which refer to the same argument.
- h. A prototypical SVC contains only one grammatical subject.

In a generative analysis of SVCs the verbs are represented as a series under VP, as illustrated in (4). In essence, generative syntax requires that SVCs be a series of VPs—or rather V's, since this is the only constituent of the sentence available that can be headed by a verb. This analysis also requires that the shared argument be the subject because this is the only core argument that can be external to the VP. However, SVCs readily occur where the object of the first verb functions as the subject of the second verb, as in (2). In this case the generative analysis of SVCs cannot apply.

(4) Generative analysis of SVCs:



2. Phase Verb Constructions Compared to Serial Verb Constructions

Collins Cobuild English Grammar (1990:184-193) (henceforth Cobuild) describes how verbs can be used in a clause in English to talk about two actions or states which are closely linked. They call this structure a 'phase', i.e. a linked sequence of events. Phase verb constructions (PVCs) (from Cobuild) are illustrated in (5) and (6). V₁ is a finite verb which can be fully marked for tense, aspect and modality, and V₂ is a nonfinite verb.

- (5) PVCs where both verbs have the same (notional) subject:
- a. Mary *stopped crying*. [main verb + bare *-ing* present participle]
 - b. Sheila *was barred from going* to work. [main verb + *from*-present participle]¹
 - c. James *wants to see* a movie. [main verb + *to*-infinitive]
 - d. Sam *helped run* the tournament. [main verb + bare infinitive]
 - e. Those very close to the blast *risk being burned*. [main verb + *-ed* past participle]
- (6) PVCs where the object of the main verb functions as the (notional) subject of the second verb:
- a. The attendant *stopped him falling*. [main verb + bare *-ing* present participle]
 - b. The new law *prevents people from smoking* in public places. [main verb + *from*-present participle]
 - c. The government *encourages people to pay* their taxes. [main verb + *to*-infinitive]
 - d. He *watched her play* tennis. [main verb + bare infinitive]

¹ Cobuild (1990) does not include the *from*-present participle forms in their set of PVCs.

- | | | |
|----|--|-----------------------------------|
| e. | Coffee <i>helped keep</i> him alert. | [main verb + bare infinitive] |
| f. | Those people <i>got burned</i> by the blast. | [main verb + -ed past participle] |

Characteristic property (3a): A prototypical SVC contains two or more morphologically independent verbs within the same clause, neither of which is an auxiliary.

By morphologically independent Kroeger means that serial verbs are not part of a verbal compound and can occur as full lexical verbs independent of the series. (*personal communication*) Phase verbs are morphologically independent in that they can all occur as independent lexical verbs:

- | | | | | |
|-----|----|----------------------------------|-----|--------------------------------|
| (7) | a. | Mary stopped. | a'. | Mary cried. |
| | b. | Sheila barred the way. | b'. | Sheila went to work. |
| | c. | James wants tan i-phone. | c'. | James saw a movie. |
| | d. | Sam helped Phil. | d'. | Sam ran the tournament. |
| | e. | They risked everything. | e'. | They were burned. |
| (8) | a. | The attendant stopped the train. | a'. | He fell. |
| | b. | Vaccination prevents disease. | b'. | People smoke in public places. |
| | c. | He encourages people. | c'. | People pay their taxes. |
| | d. | He watched her. | d'. | She played tennis. |
| | e. | Coffee helped him. | e'. | He kept alert. |
| | f. | They got the bus. | f'. | They were burned by the blast. |

The V₁ of a PVC is also not an auxiliary verb:

- | | | | |
|------|----|--|---------------------------------------|
| (9) | a. | * <i>Stopped</i> Mary crying? | [PVs do not invert with subject] |
| | b. | * <i>Helped</i> Sam run the tournament? | |
| (10) | a. | *Mary stopped <i>n't</i> crying. | [PVs do not take negator contraction] |
| | b. | *Sam helped <i>n't</i> run the tournament. | |

Characteristic property (3b): There are no conjunctions or other overt markers of subordination or coordination separating the two verbs.

Van Valin and LaPolla (1997:469-471) present argumentation that the V₂ phase verb is not a VP complement of the V₁ phase verb. This analysis is summarized in (11) and (12). Therefore the conjoining relationship between phase verbs is non-subordinate.

- | | | | |
|------|------|--|--|
| (11) | a. | Mary stopped <i>the car</i> . | |
| | a'. | <i>The car</i> was stopped by Mary. | [NP complement can be passivized] |
| | a''. | It was <i>the car</i> that Mary stopped. | [NP complement can be focussed] |
| | b. | Mary stopped <i>crying</i> . | [main verb + bare -ing present participle] |
| | b'. | * <i>Crying</i> was stopped by Mary. | [Linked core cannot be passivized] |
| | b''. | *It was <i>crying</i> that Mary stopped. | [Linked core cannot be focussed] |
| (12) | a. | Dave helped <i>the old lady</i> . | |
| | a'. | <i>The old lady</i> was helped by Dave. | |
| | a''. | It was <i>the old lady</i> that Dave helped. | |
| | b. | Sam helped <i>run the tournament</i> . | [main verb + bare infinitive] |
| | b'. | * <i>Run the tournament</i> was helped by Sam. | [Linked core cannot be passivized] |
| | b''. | *It was <i>run the tournament</i> that Sam helped. | [Linked core cannot be focussed] |

Are *to* and *from* subordinating conjunctions? Neither the *to*-infinitive nor the *from*-present participle linked cores are subordinate to the main verb, as demonstrated in (13) and (14). Therefore *to* and *from* cannot be subordinating conjunctions.

- (13) a. The new law prevents people *from smoking in public places*.
 a'. **From smoking in public places* is prevented people by the new law.
 [Linked core cannot be passivized]
 a''. *It is *from smoking in public places* that the new law prevents people.
 [Linked core cannot be focussed]
- (14) b. The government encourages people *to pay their taxes*.
 b'. **To pay their taxes* is encouraged people by the government.
 [Linked core cannot be passivized]
 b''. *It is *to pay their taxes* that the government encourages people.
 [Linked core cannot be focussed]

Also *to* and *from* cannot be substituted by coordinating conjunctions, as shown in (15), therefore they do not function as coordinating conjunctions either.

- (15) a. The new law prevents people *from/*and/*but* smoking in public places.
 b. The government encourages people *to/*and/*but* pay their taxes.

So what is the function of *to* and *from* in PVCs? Van Valin and LaPolla (1997:472) say when *to* or *from* are present the default interpretation is that the linked events do not overlap temporally, i.e. they are sequential. Their absence indicates that the linked events necessarily overlap temporally. This distinction is summarized in (16).

- (16) a. PVCs with zero marker on linked unit: [+temporal overlap].
 b. PVCs with *to/from* marker on linked unit: [–temporal overlap]. Cf. (17)-(19).
- (17) Verbs that link to a bare infinitive (express perception):
- | | | |
|-------------------------|--------------------------|---------------------|
| X felt his scalp tingle | (feel \wedge tingle) | [+temporal overlap] |
| X heard Y sing | (hear \wedge sing) | [+temporal overlap] |
| X noticed Y arrive | (notice \wedge arrive) | [+temporal overlap] |
| X watched Y dance | (watch \wedge dance) | [+temporal overlap] |
- (18) Verbs that link to a *to*-infinitive (express intention/wish or accomplishment):
- | | | |
|----------------------------|------------------|---------------------|
| X agreed <i>to</i> go | (agree & go) | [–temporal overlap] |
| X decided <i>to</i> go | (decide & go) | [–temporal overlap] |
| X volunteered <i>to</i> go | (volunteer & go) | [–temporal overlap] |
| X managed <i>to</i> go | (manage & go) | [–temporal overlap] |
- (19) Verbs that link to a *from*-present participle (express constraint):
- | | | |
|---------------------------------|----------------|---------------------|
| X barred Y <i>from</i> going | (bar & go) | [–temporal overlap] |
| X deterred Y <i>from</i> going | (deter & go) | [–temporal overlap] |
| X kept Y <i>from</i> going | (keep & go) | [–temporal overlap] |
| X prevented Y <i>from</i> going | (prevent & go) | [–temporal overlap] |

Additionally, *from* indicates that the linked event did not happen. The logical operator NOT represents the meaning of *from* in the semantic logical structures in (20).

- (20) a. Sheila was barred *from* going to work.
 a'. [**do'** (Ø, Ø)] CAUSE [NOT (**do'** (Sheila, [**go'** (Sheila) & INGR **be-at'** (work, Sheila)))]
 b. James kept Mary *from* waiting.
 b'. [**do'** (James, Ø)] CAUSE [NOT **do'** (Mary, [**wait'** (Mary)])]
 c. The new law prevents people *from* smoking in public places.
 c'. [**do'** (law, Ø)] CAUSE [NOT **be-in'** (public place, (**do'** (people, [**smoke'** (people)))]
 d. James stopped Mary *from* crying.
 d'. [**do'** (James, Ø)] CAUSE [NOT (**do'** (Mary, [**cry'** (Mary)))]

Thus the syntactic structure of PVCs is primarily coordinated core conjoining, as shown in (21) and (22). This is a prototypical SVC syntactic construction.

- (21) PVCs where both verbs have the same (notional) subject:
 a. [CL [CORE Mary stopped] [CORE crying]].
 b. [CL [CORE Sheila was barred] [CORE from going to work]].
 c. [CL [CORE James wants] [CORE to see a movie]].
 d. [CL [CORE Sam helped] [CORE run the tournament]].
 e. [CL [CORE Those very close to the blast risk] [CORE being burned]].
- (22) PVCs where the object of main verb functions as (notional) subject of second verb:
 a. [CL [CORE The attendant stopped him] [CORE falling]].
 b. [CL [CORE The new law prevents people] [CORE from smoking in public places]].
 c. [CL [CORE The government encourages people] [CORE to pay their taxes]].
 d. [CL [CORE He watched her] [CORE play tennis]].
 e. [CL [CORE Coffee helped] [CORE keep him alert]].
 f. [CL [CORE Those people got] [CORE burned by the blast]].

Characteristic property (3c): The serial verbs belong to a single intonation contour, with no pause separating them.

Cobuild (1990:184-193) cites the fact that PVCs have a single intonation contour as one of the identifying features of this construction in English. Thus PVCs have the same intonational property as SVCs.

Characteristic property (3d): The entire SVC refers to a single (possibly complex) event.

Cobuild (1990:184-193) says that PVCs describe two actions or states which are closely linked. Bohnmeyer and Van Valin (2009) suggest that the notion of 'single event' can be defined in terms of the Macro-Event Property (MEP). The MEP is a property of construction types that can encode the ontological properties of temporal space, such as expressions of location in time, duration and boundaries in time. The MEP applies to constructions that package the parts of an event so tightly as to not permit individual access by temporal expressions, e.g. adverbials, temporal clauses, tenses. Bohnmeyer and Van Valin present cross-linguistic evidence that single core constructions must have the MEP and that multiple core constructions only have the MEP if they are cosubordinate. However, none of the PVCs in (5) and (6) have cosubordinate cores. Instead they have coordinated cores, as illustrated in (21) and (22). Nevertheless, PVCs, as in (5) and (6), are considered to describe single (possibly complex) events because the SVC has only one tense designation. Only the V₁ main

verb can be marked for tense; the V_2 is nonfinite. All PVCs except the *from*-present participle form do not allow separate modification by a temporal adverbial, as illustrated in (23). Thus PVCs demonstrate Macro-Event Properties even though they are not cosubordinate.

(23) PVCs and individual temporal modifiers:

- a. Mary *stopped* (*yesterday) *crying* (today).
- b. Sheila *was barred* (yesterday) *from going* to work (today).
- c. James *wants* (*yesterday) *to see* a movie (today).
- d. Sam *helped* (*yesterday) *run* the tournament (today).
- e. Those very close to the blast *risk* (*yesterday) *being burned* (today).

Also, as with SVCs, the verbs in a PVC can have a specialized function. This is another characteristic of a single event description. For example, the V_1 (main) verb can set a temporal frame for the V_2 (nonfinite) verb. In (24) the verbs *begin* and *start* express the onset of an event, *continue* and *keep* express the continuation of an event, and *finish* and *stop* express the termination of an event. The semantic representations for the temporal frames are respectively, BECOME for the onset of an event (24a''), CONTINUE for the continuation of an event (24b''), TERMINATE for the termination of an event (24c''). Van Valin (2005:51) suggests that the logical structure of *begin* in this context is BECOME **do'** (x, y), where the logical structure of the complement verb fills the y variable slot. This is because *begin* is a full lexical verb in this construction and not an auxiliary verb or operator.

- (24) a. Mary *began* crying. [begin = onset of event]
 a'. Mary *started* crying. [start = onset of event]
 a''. BECOME **do'** (Mary, [**do'** (Mary, [**cry'** (Mary))])
 b. Mary *continued* crying. [continue = continuation of event]
 b'. Mary *kept* crying. [keep = continuation of event]
 b''. CONTINUE **do'** (Mary, [**do'** (Mary, [**cry'** (Mary))])
 c. Mary *finished* crying. [finish = termination of event]
 c'. Mary *stopped* crying. [stop = termination of event]
 c''. TERMINATE **do'** (Mary, [**do'** (Mary, [**cry'** (Mary))])

When this type of main verb is transitive it has a causative meaning:

- (25) a. James *started* Mary crying.
 a'. [**do'** (James, Ø)] CAUSE [BECOME **do'** (Mary, [**cry'** (Mary))]
 b. James *kept* Mary waiting.
 b'. [**do'** (James, Ø)] CAUSE [CONTINUE **do'** (Mary, [**wait'** (Mary))]
 c. James *stopped* Mary crying.
 c'. [**do'** (James, Ø)] CAUSE [TERMINATE **do'** (Mary, [**cry'** (Mary))]

Another specialized function is that the V_1 can set a spatial frame for the V_2 event, as illustrated in (26).

- (26) a. The child *lay* sleeping.
 a'. **do'** (child, [**lay'** (child)]) \wedge **do'** (child, [**sleep'** (child)])²
 b. The teacher *sat* reading.
 b'. **do'** (teacher, [**sit'** (teacher)]) \wedge **do'** (teacher, [**read'** (teacher)])

² Note that *sleep* is understood to be an activity rather than a state as it can be interrupted.

- c. The waitress *stood* talking.
 c'. **do'** (waitress, [**stand'** (waitress)]) \wedge **do'** (waitress, [**talk'** (waitress)])

The V_2 can also modify the meaning of the V_1 . For example, the V_2 can indicate a perfective/imperfective aspect modification of the V_1 event. In (27a) and (b) the bare infinitives of *scream* and *run* give the meaning that these events are completed within the event frame of the preceding perception verb. Whereas when the present participial forms are used in (27a') and (b') the events of 'scream' and 'run' are not completed within the event frame of the perception verbs.

- (27) a. They heard her *scream*. [hear = perfective event]
 a'. They heard her *screaming*. [hear = imperfective event]
 a''. **hear'** (they, [**do'** (her, [**scream'** (her)])]
 b. They saw him *run*. [see = perfective event]
 b'. They saw him *running*. [see = imperfective event]
 b''. **see'** (they, [**do'** (him, [**run'** (him)])]

The V_2 can indicate the manner in which the V_1 event is performed. In (28a) and (b) the V_1 motion verb is modified by the V_2 , which expresses the manner in which the motion is carried out. The logical structures of (28a') and (b') specify two events occurring concurrently. This is the same as in (26a',b',c'). However, whereas in (26) the V_1 specifies the spatial frame of the event and is the modifying verb, in (28) it is the V_2 that specifies this modification of the complex event.

- (28) a. The girls came out *running* / came *running* out.
 a'. **do'** (girls, [**come'** (girls)]) \wedge **do'** (girls, [**run'** (girls)]) & INGR **be-out'** (girls)
 b. Bill entered the room *skipping*.
 b'. **do'** (Bill, [**enter'** (Bill, room)]) \wedge **do'** (Bill, [**skip'** (Bill)])

Characteristic property (3e): A true SVC may contain only one specification for tense, aspect, modality, negation, etc., though these features are sometimes redundantly marked on both verbs.

With regard to the scope of tense, aspect, modality and negation operators in PVCs, the full range of these categories can only be marked on the V_1 finite verb, as illustrated in (29)-(33). As a clause operator, tense has default scope over both the phase verbs. As nuclear operators, progressive and perfective aspects only have scope over the first verb. Modality operators, such as *must*, and the negation operator are core operators and they may have scope over just the first verb, in which case it is a core coordination nexus, or they may have scope over both the verbs, in which case it is a core cosubordination nexus. Only negation can be marked independently on the V_2 nonfinite verb, as illustrated in (34).

- (29) the bare -ing present participle:
- | | | | |
|------|---|---------------------|---------------|
| Mary | { | stopped crying. | [past tense] |
| | | is stopping crying. | [prog aspect] |
| | | has stopped crying. | [prfv aspect] |
| | | must stop crying. | [modal] |
| | | didn't stop crying. | [negation] |

(30) the *from*-present participle:

Sheila	{	<i>was prevented</i> from going to work.	[past tense]	}
		<i>is being prevented</i> from going to work.	[prog aspect]	
		<i>has been prevented</i> from going to work.	[prfv aspect]	
		<i>must be prevented</i> from going to work.	[modal]	
		<i>wasn't prevented</i> from going to work.	[negation]	

(31) the *to*-infinitive:

The government	{	encourages people to pay their taxes.	[present tense]	}
		<i>is encouraging</i> people to pay their taxes.	[prog aspect]	
		<i>has encouraged</i> people to pay their taxes.	[prfv aspect]	
		<i>must encourage</i> people to pay their taxes.	[modal]	
		<i>didn't encourage</i> people to pay their taxes.	[negation]	

(32) the bare infinitive:

He	{	<i>watches</i> her play tennis.	[present tense]	}
		<i>is watching</i> her play tennis.	[prog aspect]	
		<i>has watched</i> her play tennis.	[prfv aspect]	
		<i>must watch</i> her play tennis.	[modal]	
		<i>didn't watch</i> her play tennis.	[negation]	

(33) the *-ed* past participle:

Those people	{	<i>got</i> burned by the blast.	[past tense]	}
		<i>are getting</i> burned by the blast.	[prog aspect]	
		<i>have got</i> burned by the blast.	[prfv aspect]	
		<i>must have got</i> burned by the blast.	[modal]	
		<i>didn't get</i> burned by the blast.	[negation]	

(34) a. From today he has started *not* smoking.

b. Cheap booze encourages people to *not* quit drinking.

With regard to negation, Kroeger (2004:230) says one clear indication that the two serialized verbs express a single event is that we cannot negate one verb while asserting the truth of the other. But since verb serialization is prototypically core coordination with arguments shared between the cores, and since negation is a core operator (as well as a nuclear and clause operator) it does not follow that negating one core independently of the other core disqualifies a construction as an SVC.

Kroeger (2004:230) also says that it is generally not possible for the two (or more) verbs in an SVC to have independent marking for tense and aspect. He illustrates this from Akan (35). In (35a) both verbs are marked for past tense and this is a serial verb construction. It is not possible to have one verb marked for past tense and one marked for perfect aspect in an SVC, as shown by (35b). For this coding, a coordinating conjunction must be used, as in (35c). In (35c) the verbs belong to separate clauses.

(35) Akan (Akuapem dialect; Shachter, 1974)

a. me-kɔɔ-e me-baa-e.

I-go-PAST I-come-PAST

- ‘I went and came back.’
- b. *me-kɔɔ-e maba.
I-go-PAST I-come-PERF
- c. me-kɔɔ-e na maba.
I-go-PAST and I-come-PERF
‘I went and I have come back.’

However, there are some issues with the Akan example Kroeger uses to substantiate his claim that it is generally not possible for the two (or more) verbs in an SVC to have independent marking for both tense and aspect. Firstly, Christaller (1964:58-59) says that the verb in Akan can be marked for either past tense or perfect, but not both categories. Compare English where tense and perfective aspect can both be marked on the same verb, e.g. *he has gone* [present tense + perfective aspect] vs. *he had gone* [past tense + perfective aspect]. Secondly, Christaller (1964:58-59) calls perfect in Akan a tense and says it indicates an action completed in past time, but whose result is present as a state, or whose consequences extend to the present time. If perfect is a tense category in Akan then it stands to reason that two different tenses cannot be marked on the same clause. Thirdly, aspect is a nuclear operator. As such, aspect has scope over the nucleus and not the core or the clause. In the Barai example, (36), the verb *furi* ‘finish’ is an aspectual modifier of *ufu* ‘cut’, but these verbs form an SVC with *numu* ‘pile’ and *akoe* ‘throw.away’ because *fu* ‘3sg’ and *vazai* ‘grass’ are shared arguments for all these verbs. Thus while it is true that verbs in an SVC must all come under the scope of the one tense category, since tense is a clausal operator, it is not necessarily the case that verbs in an SVC cannot be marked independently for an aspectual category.

(36) Barai (Olson, 1981)

Fu vazai ufu furi numu akoe.
3sg grass cut finish pile throw.away
‘He finished cutting, piled and threw away the grass.’

What about the nonfinite forms of the V_2 in the English phase verb constructions, as summarized in (37)? Do they effect the tense, aspect or modality status of the PVC? They do not, since these categories are marked once only on the V_1 main verb. What the V_2 nonfinite forms do effect is the relationship between the events expressed by V_1 and V_2 . The examples in (27) show that a V_2 bare infinitive gives a perfective meaning to the event described by the V_1 and that a V_2 bare *-ing* present participle gives an imperfective meaning to the event described by the V_1 . Examples (17)-(19) show that the V_2 *to*-infinitive and *from*-present participle forms indicate that there is no temporal overlap of the V_2 event with that described by the V_1 .

(37) Nonfinite V_2 forms in the PVC:

- a. bare *-ing* present participle
- b. *from*-present participle
- c. *to*-infinitive
- d. bare infinitive
- e. *-ed* past participle

(38) The function of the *-ed* past participle:

- a. the perfective aspect following *have*: *He has called twice today.*
- b. the passive voice following *be*: *Her brother is called John.*
- c. *-ed* past participle clauses: *Called early, he ate a quick breakfast.*

According to Quirk (1985:97) the primary functions of the *-ed* past participle in English are as given in (38). Cobuild (1990:185-186) say that the *-ed* past participle can occur as the nonfinite V₂ in a PVC either with or without *to*. In both cases the V₂ can either have a passive function, as in (39a,c) or a perfective aspect function, as in (39b,d). However, neither of these expressions effect the tense category of the PVC as a unit.

(39) The *-ed* past participle in the PVC:

- | | | |
|----|--|------------------------------|
| a. | Those very close to the blast risk <i>being burned</i> . | [passive voice function] |
| b. | Neither Rita nor I recalled ever <i>having seen</i> her. | [perfective aspect function] |
| c. | She wanted to <i>be reassured</i> . | [passive voice function] |
| d. | They claimed to <i>have shot down</i> 22 planes. | [perfective aspect function] |

Characteristic property (3f): The two verbs in the SVC share at least one semantic argument.

PVCs are either as in (5), where both verbs have the same (notional) subject, or as in (6), where the object of the main verb functions as the (notional) subject of the second verb. This sharing of grammatical arguments is matched in logical structure in various ways, depending on the form of the logical structure.

(5) PVCs where both verbs have the same (notional) subject:

- | | | |
|-----|---|------------|
| a. | <i>Mary</i> stopped crying. | |
| a'. | TERMINATE do' (Mary, [do' (Mary, [cry' (Mary))])]) | (stop)/cry |
| b. | <i>Sheila</i> was barred from going to work. | |
| b'. | [do' (Ø, Ø)] CAUSE [NOT (do' (Sheila, [go' (Sheila) & INGR be-at' (work, Sheila)))] | (bar)/go |
| c. | <i>James</i> wants to see a movie. | |
| c'. | want' (James _i , [[do' (x _i , Ø)] CAUSE [see' (x _i , movie)]]]) | want see |
| d. | <i>Sam</i> helped run the tournament. | |
| d'. | do' (Sam _i , [help' (Sam _i , Ø)] CAUSE [[do' (Sam _i , [run' (Sam _i , Ø))] ∧ [do' (Ø _k , [run' (Ø _k , help run Ø))]] & INGR exist' (tournament)) | |
| e. | <i>Those very close to the blast risk</i> being burned. | |
| e'. | [do' (those _i , Ø)] CAUSE [POSSIBLE [[do' (Ø, Ø)] CAUSE [BECOME burned' risk (those _i)]]] | burn |

(6) PVCs where the object of the main verb functions as the (notional) subject of the second verb:

- | | | |
|-----|--|-----------------|
| a. | The attendant stopped <i>him</i> falling. | |
| a'. | [do' (attendant, Ø)] CAUSE [TERMINATE (fall' (him))] | (stop)fall |
| b. | The new law prevents <i>people</i> from smoking in public places. | |
| b'. | [do' (law, Ø)] CAUSE [NOT be-in' (public place, (do' (people, [smoke' (people)))))] | (prevent)/smoke |
| c. | The government encourages <i>people</i> to pay their taxes. | |

- c'. [**do'** (government, [**say'** (government, Ø)))] CAUSE [TERMINATE **do'** (people, [**pay'** (people, their taxes)))]
(*encourage*)/*pay*
- d. He watched *her* play tennis.
- d'. **do'** (he, [**see'** (he, she)]) \wedge **do'** (she, [**play'** (she, tennis)])
watch *play*
- e. Coffee helped keep *him* alert.
- e'. **do'** (coffee, [**help'** (coffee, him)]) CAUSE [CONTINUE (**be-alert'** (him)))]
help *keep*
- f. *Those people* got burned by the blast.
- f'. [INGR **happen'** (blast)] CAUSE [INGR **burned'** (people)]
(*got*)/*burn*

Characteristic property (3g): Obligatory non-coreference: a true SVC will not contain two overt NPs which refer to the same argument.

A PVC cannot contain two overt NPs which refer to the same semantic argument. This is illustrated in (40).

- (40) PVCs where the object of the main verb functions as the (notional) subject of the second verb:
- He_i *stopped* him_{*i/k} *falling*.
 - They_i *prevented* them_{*i/k} *from smoking* in public places.
 - She_i *encouraged* her_{*i/k} *to pay* their taxes.
 - He_i *watched* him_{*i/k} *play* tennis.
 - Those people_i *got burned* by them_{*i/k}.

Characteristic property (3h): A prototypical SVC contains only one grammatical subject.

PVCs in English may only contain one overt grammatical subject, as illustrated in (41) and (42).

- (41) a. *Mary* stopped (*she) crying.
b. *Sheila* was barred (*she) from going to work.
c. *James* wants (*he) to see a movie.
d. *Sam* helped (*he) run the tournament.
e. *Those very close to the blast* risk (*they) being burned.
- (42) a. *The attendant* stopped him (*he) falling.
b. *The new law* prevents people (*they) from smoking in public places.
c. *The government* encourages us (*we) to pay their taxes.
d. *He* watched her (*she) play tennis.
e. *Coffee* helped keep him (*he) alert.
f. *Those people* got (*they) burned by the blast.

3. Conclusion

Table 1 compares the properties of SVCs as given in (3) with the properties of PVCs described in §2. From this we see that phase verb constructions in English have the same semantic and syntactic properties as serial verb constructions found in Creole languages, West Africa, mainland Southeast Asia, New Guinea and the Pacific Islands. We can therefore conclude that phase verb constructions in English are a type of serial verb construction.

Table 1: Properties of English phrase verb constructions compared to SVC properties

SVC properties	English PVC properties
A prototypical SVC contains two or more morphologically independent verbs within the same clause, neither of which is an auxiliary.	PVC s are a combination of fully lexical verbs; none of which is an auxiliary, see (9). The first verb in the series is finite and the second nonfinite.
In SVCs there are no conjunctions or other overt markers of subordination or coordination separating the two verbs.	The second nonfinite verb in a PVC is not subordinate to the first verb, see (11)-(12). The <i>to</i> in the <i>to</i> -infinitive form and the <i>from</i> in the <i>from</i> -participle form do not indicate a subordinate or coordinate relationship. Instead the presence of <i>to</i> and <i>from</i> indicate no temporal overlap between the events described by the first and second verbs. Additionally, <i>from</i> indicates that the event described by the <i>from</i> -participle verb did not occur.
The verbs in an SVC belong to a single intonation contour, with no pause separating them.	The verbs in a PVC belong to a single intonation pattern.
The entire SVC refers to a single (possibly complex) event.	PVC s describe two actions or states which are closely linked. The nonfinite verb may describe the main event and be modified by the preceding finite verb, see (24)-(25) and (26). Vice versa, the finite verb may describe the main event and be modified by the following nonfinite verb, see (28).
A true SVC may contain only one specification for tense, aspect, modality, negation, etc., though these features are sometimes redundantly marked on both verbs.	PVCs comprise finite verb + nonfinite verb. The nonfinite form may be the infinitive or a past <i>-ed</i> or <i>-ing</i> present participle. Only the finite verb is marked for tense.
The two verbs in the SVC share at least one semantic argument.	PVCs may have a single subject argument shared by both verbs, as in (5), or an object of the first verb interpreted as subject of the second verb, as in (6).
Obligatory non-coreference: a true SVC will not contain two overt NPs which refer to the same argument.	Where a non-reflexive pronoun occurs in a phase verb construction it cannot be coreferential with any other argument in the construction. E.g. in <i>he stopped teasing him</i> , <i>he</i> and <i>him</i> cannot be coreferential.
A prototypical SVC contains only one grammatical subject.	PVCs may only contain one grammatical subject. See (41) and (42).

The verbal complexes in English called phase verb constructions in *Collins Cobuild English Grammar* (1990:184-193) are undoubtedly serial verb constructions. Thus contrary to typological predictions, serial verb constructions occur in English.

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The left Periphery and Focus Structure in Japanese

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Abstract

Given the elaborate morphosyntactic representations of topic and focus in Japanese, it has been a challenge to describe fully how the different types of topic and focus are differentiated in the language. This study integrates *subordinate focus structure* (Erteschik-Shir 1997, 2007) into Role and Reference Grammar and examines various topic and focus elements which are linked with the so-called left periphery of a sentence in Japanese. For each topic/focus type, a default focus structure representation is proposed, and it is also extended to account for particular focus-shifting effects which result from marked use of the topic/focus phrase.

Keywords

Topic, focus, left periphery, Japanese

1. Introduction

Despite the elaborate morphosyntactic representations of topic and focus in Japanese, it has not been described fully how different types of topic and focus are represented in the syntax of Japanese. In particular, the relationship between contrastive topic and contrastive (or narrow) focus has been unclear with respect to their common and discrete properties. Thus, this paper examines various topic and focus elements which are particularly linked with the so-called left periphery of a sentence in Japanese and attempts to present detailed structural and focus-structure representations in Role and Reference Grammar [RRG] (Van Valin & LaPolla 1997, Van Valin 2005). More specifically, the goals of the paper consist of the following: (1) to describe the structural and pragmatic properties of the left periphery in Japanese, with special reference to the so-called topic marker *-wa* and nominative marker *-ga*, (2) to define different types of topic and focus (topic, contrastive topic, contrastive focus, restrictive focus, etc.) by integrating the notion of subordinate focus-structure (Erteschik-Shir 1997, 2007) into focus structure projection in RRG, and (3) to capture “unexpected” uses of topic and focus, which bring out particular focusing or defocusing effects, by pinpointing the extended use of topic and focus.

It is widely known in the so-called discourse-configurational languages that the left periphery of a sentence exhibits pragmatic prominence, which is commonly associated with the terms topic and focus. In these languages, word order is often restricted according to the position of topic and focus, hence, *rigid focus structure* as found in French, Toba Batak, Sesotho, and Italian (Van Valin 1999). However, as shown in (1), the pragmatically specialized nature of the left-periphery (e.g. ‘yesterday’ and ‘what’) is observed even in English, which is considered as a language of *rigid syntax* in which topicalization and focus fronting are not required, except for wh-fronting.

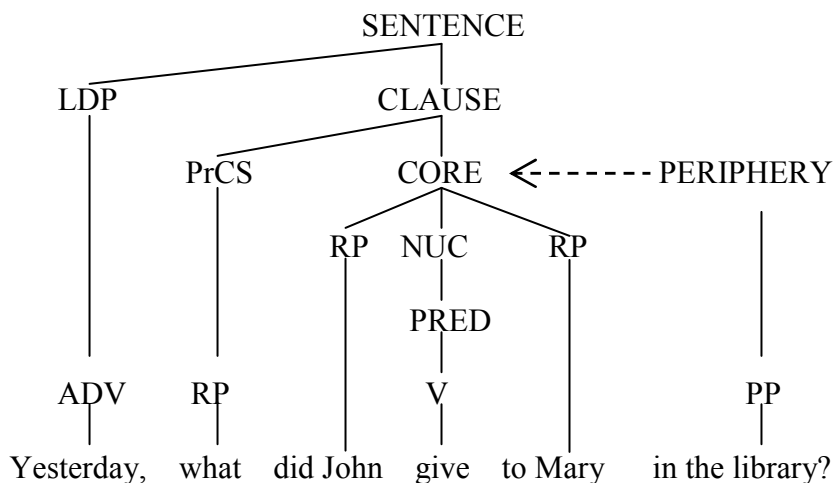
- (1) Yesterday, what did John give to Mary in the library?

The critical property of the left periphery is that the left edge of a sentence is commonly ambivalent between topic and focus, not only because the left periphery often hosts separate topic and focus phrases in the same sentence, but also because it may host a phrase that is both topic and focus like. In a number of languages, sentence initial topics represent so-called contrastive or switch topics, a specific type of topic that has some focus properties, and sentence initial foci represent restrictive or narrow foci, a specific type of focus that has some topic properties (Erteschik-Shir 2007).¹ It should be noted, however, that not all languages require the left periphery; for example, topicalization is optional in Danish, but it is strongly preferred in languages such as Hungarian, Japanese and Korean.

With respect to ordering within the left periphery, a topic typically precedes a focus. In Hungarian, for example, a topic is followed by a restrictive focus, and regular focus appears in situ post-verbally (Horvath 2000). The topic-focus ordering in the left periphery applies to Japanese also, as will be discussed in Section 6.

The properties of the left periphery outlined thus far are captured by the RRG layered structure of the clause, as shown in (2). The left-detached position [LDP] represents a sentence-initial topic, and this topic position is followed by a Pre-core slot [PrCS], a fronted focus position. The PrCS houses a specialized focus, which may be a narrow focus as in the English example, or a contrastive or restrictive focus as in the case of Japanese. A regular focus may appear in situ anywhere in the clause within the potential focus domain.²

(2) LDP and PrCS as the left periphery (Van Valin 2008)



The discussion for the present study will proceed as follows. In Section 2, I will give an overview of topic and focus NPs that are relevant to the left periphery in Japanese. Section 3 provides a summary of the previous proposals in RRG and lays out the remaining issues to be examined. In Section 4, I will discuss the representation of subordinate focus structure, and in Section 5, I will show how the representation is applied to the observed range of topic and focus NPs in Japanese. Section 6 integrates the focus structure representation into the RRG clause structure representation. Sections 7 and 8 describe how the irregular use of topic and focus-NPs is captured in RRG and how the various focus-shifting effects are predicted.

¹ These languages include Catalan, Czech, Danish, German, Hungarian, Italian, Japanese, Korean, and American Sign Language.

² There is also a post-core slot, for a post-verbal focus position in a verb-final language such as Japanese, and a right detached position, for a post-verbal topic position. See Section 9 and also Shimojo (1995, 2009).

Section 9 incorporates the current proposal into the linking algorithm and demonstrates the essential roles played by both the focus structure projection and the discourse representation structure.

2. *Wa* and *ga*: topic and focus in Japanese

First, an overview is in order for some morphosyntactic properties of Japanese that is relevant to the present study. The canonical word order in Japanese is SOV, though it allows some flexibility such as preposing and postposing (or left and right dislocation) of arguments and adjuncts (Shimojo 1995). In general, post-nominal markings are sensitive to the focus structure, especially the topic marker *-wa* and the nominative marker *-ga*. A topic marked argument and adjunct appear sentence-initially (e.g. $S_{top}OV$, $O_{top}SV$). A non-sentence-initial topic marked argument or adjunct represents explicit contrastiveness. An argument that is part of the focus normally remains in situ, but a non-subject in narrow or contrastive focus may be preposed (e.g. $O_{foc}(S)V$). Also, subjects of particular predicate types which denote permanent and generic states of affairs are topic-marked unless they represent narrow focus (and marked with *-ga* in such a case). On the other hand, subjects of “presentational” verbs, such as *aru* ‘to exist (for nonanimate)’, *iru* ‘to exist (for animate)’, *kuru* ‘to come’, favor the nominative marking, and topic marking for such subjects typically evokes an explicit contrastive sense.

The alternation of post-nominal markings for subjects is illustrated in (3)-(5), which are taken from Lambrecht (1994: 223).³

- (3) What happened to your car?
 (kuruma-wa) kosyoosita [predicate-focus]
 car-TOP broke.down
 ‘(The car) broke down.’
- (4) What happened?
 kuruma-ga kosyoosita [sentence-focus]
 car-NOM broke.down
 ‘The car broke down.’
- (5) I heard your motorcycle broke down.
 KURUMA-GA kosyoosita [argument-focus]
 car-NOM broke.down
 ‘THE CAR broke down.’

The answer in (3) represents predicate-focus, in reply to the question ‘what happened to your car?’. Although *kuruma* ‘the car’ in the answer does not need to be repeated, *wa* is clearly the choice over *ga* if it is overtly present. If the nominative argument is either part of the focus or the narrow focus, as shown in (4) and (5) respectively, it is marked with *ga*.

Also, it has long been observed (Kuno 1973) that the topic marking is also used to represent contrastiveness, as shown in (6).

³ The following abbreviations are used for the examples: ACC=accusative, COP=copula, FP=sentence final particle, LK=linker, NOM=nominative, Q=question marker, and TOP=topic.

- (6) I heard Ken and Sayaka came yesterday.
 ken-wa kita
 Ken-TOP came
 ‘Ken came (but Sayaka didn’t).’

The use of *wa* in (6) puts Ken and Sayaka in contrast with respect to the proposition in question; it implies Sayaka did not come. If the topic marker for *Ken* is replaced with the nominative marker, the sense of contrast is lost and the sentence becomes awkward in the given context.

For the purpose of the present study, I use the term *topic* to refer to NP’s marked with *wa* because it is how the language marks the fronted non-focus part of the sentence. It should be noted, however, that in discourse, zero anaphora is the default choice for a continuing topic, and an overt *wa*-marked argument is typically used for contrastive topics (Shimojo 2005). For the definition of focus, I follow Lambrecht’s (1994) characterization that focus represents non-presupposed information. The characterization of topic and focus above serves as the basis for the present analysis, which I will extend later to capture some irregular use of *wa* and *ga*, where *wa* is used when *ga* is expected, and vice versa.

3. Previous claims in RRG and remaining issues

3.1 Hasegawa (1992, 1996)

The classic dichotomy of topic and focus with respect to *wa* and *ga* is reflected in Hasegawa’s analysis within RRG, as summarized in (7). A topic NP-*wa* is placed in a LDP and a narrow-focus NP-*ga* in a PrCS. A NP-*ga* which is part of a sentence-focus is within the CORE, under an ARG node (which is labeled referential phrase [RP] in the current RRG layered structure of the clause (Van Valin 2008)). Hasegawa (1996: 41) places a contrastive NP-*wa* in PrCS because “[c]ontrastive NP-*wa*’s and narrow focus NP-*ga*’s are cognitively similar: both convey the idea ‘THIS entity, but not something else.’

- (7) Topic NP-*wa*: LDP
 Narrow-focus NP-*ga*, Contrastive NP-*wa*: PrCS
 Part of sentence-focus NP-*ga*: within CORE

Besides the obvious association of a topic with LDP and a narrow-focus with PrCS, the merit of Hasegawa’s analysis is the recognition of the property common to contrastive *wa* and narrow-focus *ga* NP’s, as they both exhibit a “focus” property. At the same time, however, this proposal fails to capture properties that separate the two types of “focus” NPs in PrCS and properties shared by topic NP-*wa* and contrastive NP-*wa*. In other words, why are some NP’s in PrCS marked with *wa* and others marked with *ga*, and why are some NP-*wa*’s in LDP and other NP-*wa*’s in PrCS, despite the same post-nominal marking?

3.2 Shimojo (1995)

A quantitative study of spoken Japanese in TV talk shows in Shimojo (1995) offered a different view with respect to topic and contrastive NP-*wa*’s. Frequency counts of subject NPs in discourse pointed to a common ground that there was an overall tendency to associate NP-*wa*’s, whether contrastive or non-contrastive, with recent reference in the preceding discourse, hence, to exclude them from the focus domain of the sentence. The merit of the discourse-

based study was the finding that contrastive *wa*, as well as topic *wa*, exhibited a tendency to represent previously given referents, which suggests that contrastiveness is in principle independent of the givenness of referents.

As expected, NP-*ga*'s in the spoken Japanese data dominantly represented brand-new referents or inactive referents to be re-introduced after some absence. Given these findings, the following structural representations in RRG were proposed.

- (8) Topic NP-*wa*, Contrastive NP-*wa*: LDP
 Narrow-focus NP-*ga*: PrCS
 Part of sentence-focus NP-*ga*: within CORE

3.3 Remaining issues

Although each of the preceding studies outlined above points out critical properties of the topic and focus NPs, their mutually exclusive claims have fallen short of a satisfactory account. While Hasegawa (1992, 1996) fails to show how contrastive NP-*wa*'s are differentiated from narrow-focus NP-*ga*'s, the discourse generalizations presented in Shimojo (1995) do not tease apart the two types of NP-*wa*'s and fails to show the same focus property associated with contrastive NP-*wa*'s and narrow-focus NP-*ga*'s. Thus, these shortcomings collectively point to the need of a framework to properly capture the properties of topic and focus NPs, consisting of a common property for NP-*wa*'s (both contrastive and non-contrastive), a common property for NP-*ga*'s (both part of broad-focus and narrow-focus), and a common property for contrastive NP-*wa* and narrow-focus NP-*ga*.

Furthermore, Shimojo's (2005) recent extensive discourse-based study of argument forms in Japanese has revealed that, in informal Japanese conversations, the use of *wa* is ambivalent in terms of givenness of referents represented by the *wa*-marked NPs. Both subject NP-*wa*'s and direct object NP-*wa*'s represented given and new referents almost equally; hence, it has been suggested that the index of newness/givenness of referents per se does not predict the use of NP-*wa*.⁴ On the other hand, the NP-*wa*'s in the data were found to be predominantly contrastive (91% of the total 336 cases); therefore, it has been suggested that contrastiveness is the reliable index to predict the use of *wa*. Yet, the discourse-based findings do not dissociate NP-*wa* from the givenness of referents (i.e. the non-focus of a sentence) and they vividly point to the fact that NP-*wa*'s do represent either given or new information and a theory also needs to capture the "irregular" use of *wa*, where the "topic" marking is associated with new information.

4. Subordinate focus structure

In order to overcome the previous shortcomings discussed above, I adopt the representation of *subordinate f(ocus)-structure* (Erteschik-Shir 1997, 2007) and incorporate it into the RRG notions of clause and focus structure.

⁴ Of the total 252 subject NP-*wa*'s, 145 (58%) were used for referents in the referential distance [RD] range of 1 through 10 clauses, and 107 (42%) were used in the RD range of 11 clauses and over, including "no previous reference". Of the total 25 direct object NP-*wa*'s, 13 (52%) were used for RDs of 1 through 10 clauses and 12 (48%) were used for RDs of 10 clauses and over, including "no previous reference".

A subordinate f-structure is a complex f-structure with a f-structure embedded in a matrix f-structure which is a main topic or focus. Using this representation, Erteschik-Shir illustrates how specific indefinite NPs are licensed as topic with the following examples.⁵

(9) A person I know is famous.

(10) A person_{foc} [I_{top} know_]

(11) I_{top} know [a person]_{foc}

In essence, it is the specificity of specific indefinites that allows it to be a topic. The subject of the sentence in (9), ‘a person I know’ has a subordinate f-structure of its own, as shown in (10). In the f-structure represented by (10), the indefinite ‘a person’ is the focus and ‘I’ in the relative clause is the topic, hence there is specificity on ‘a person’ (the 1st person subject is permanently available as topic). Thus, the f-structure of (10) is equivalent with the f-structure of the simple sentence given in (11).

Furthermore, a subordinate f-structure can provide an explanation for the fact that indefinite NPs can be topics if contrastiveness is involved, as shown in (12).

- (12) a. # A dog is intelligent.
b. A DOG is intelligent, a CAT is not.

Contrastive elements function as both topics and foci because a contextually available set serves as topic and the element selected from the set serves as a focus. In the case of (12b), ‘a dog’ has a subordinate f-structure that is included in the full f-structure given in (13).

(13) [{dog_{foc}, cat}_{top}]_{top} [is intelligent]_{foc}

The fully spelled out sentence of (13) is provided in (14). However, the subordinate topic ‘cat’ can be dropped, as in the first clause of (12b), or pronounced, as in (14).

(14) A dog, not a cat, is intelligent.

Erteschik-Shir (2007: 50) states that the bi-level representation of focus structure is particularly useful to tease out the complex focus structure associated with contrastive elements, which function as both topics and foci, because it accounts for the various contrastive readings that are derived by different ways of imposing one f-structure on the other. In what follows, I will discuss subordinate f-structure of NP-*wa* and NP-*ga* in Japanese and provide their classification in terms of contrastive topic and focus types.

⁵ Erteschik-Shir points out that, unlike non-specific indefinites (e.g. ‘a person’), specific indefinites can be topicalized in languages such as Danish, and they also can serve as the subject of individual-level predicates (e.g. ‘A student I know is intelligent’, ‘#A student is intelligent’). See Erteschik-Shir (2007: 19-22) for the discussion of other topic tests.

5. NP-*wa* and NP-*ga*: five topic/focus types

Using the subordinate f-structure representation, I propose the f-structure representations for the five topic and focus types listed in (15). Each type is discussed with examples below.

- (15) a. Contrastive NP-*wa*: $[\{x_{\text{foc}}, y\}_{\text{top}}]\text{-WA}_{\text{top}} [\text{predicate}]_{\text{foc}}$
 b. Contrastive (narrow) focus NP-*ga*: $[\{x_{\text{foc}}, y\}_{\text{top}}]\text{-GA}_{\text{foc}} [\text{predicate}]$
 c. Restrictive focus NP-*ga*: $[\{x_{\text{foc}}, \dots\}_{\text{top}}]\text{-GA}_{\text{foc}} [\text{predicate}]$
 d. Non-contrastive (broad) focus NP-*ga*: $x\text{-GA}_{\text{foc}} [\text{predicate}]_{\text{foc}}$
 e. Topic NP-*wa*: $[\{x_{\text{foc}}, \dots\}_{\text{top}}]\text{-WA}_{\text{top}} [\text{predicate}]_{\text{foc}}$

5.1 Contrastive NP-*wa*: $[\{x_{\text{foc}}, y\}_{\text{top}}]\text{-WA}_{\text{top}} [\text{predicate}]_{\text{foc}}$

The contrastive NP-*wa*, or contrastive topic, requires a contextually provided set such as $\{x, y\}$ and $\{x, y, z\}$. The set as a whole is a topic and, from the set, a particular element (e.g. x) is selected; hence, the selected element is a focus. The NP-*wa* is the topic of the matrix-level f-structure and the predicate is the focus. Overall, this topic type represents predicate-focus, despite the contrastiveness involved. In (16b), for example, the contrastive subject represents a complex f-structure, where ‘brother’ (focus) is selected from the given set (topic), and the NP-*wa* as a whole represents a topic of the matrix f-structure.

- (16) a. watashi-wa ani-to imooto-ga imasu
 I-TOP older.brother-and younger.sister-NOM exist
 ‘I have an older brother and a younger sister’
 b. ani-wa tookyoo-ni sundeimasu $[\{ani_{\text{foc}}, imooto\}_{\text{top}}]\text{-WA}_{\text{top}}$
 older.brother-TOP Tokyo-in living
 ‘(My) older brother lives in Tokyo.’

‘Sister’, which is in the subordinate f-structure, can be overtly present as shown in (17); however, the NP-*wa* containing just the subordinate focus element is sufficient to express the contrastive topic in the given context.

- (17) imooto janakute ani-wa tookyoo-ni sundeimasu
 younger.sister not older.brother-TOP Tokyo-in living
 ‘(My) older brother, not younger sister, lives in Tokyo.’

5.2 Contrastive (narrow) focus NP-*ga*: $[\{x_{\text{foc}}, y\}_{\text{top}}]\text{-GA}_{\text{foc}} [\text{predicate}]$

Contrastive focus NP-*ga* and contrastive topic NP-*wa* share the same subordinate f-structure; in both cases, the element (focus) is selected from a contextually provided set (topic). However, for contrastive focus NP-*ga*, the NP-*ga* is the focus of the matrix f-structure. An example is provided in (18).

- (18) A1 gokyoodai-wa?
 siblings-TOP
 ‘(How about your) siblings?’

- B1 ani-to imooto-ga imasu
 older.brother-and younger.sister-NOM exist
 ‘(I) have an older brother and a younger sister’
- A2 sorede donata-ga tookyoo-ni irassharu no?
 and who-NOM Tokyo-in exist Q
 ‘And who is in Tokyo?’
- B2 ani-ga tookyoo-ni imasu $[\{ani_{foc}, imooto\}_{top}]-GA_{foc}$
 older.brother-NOM Tokyo-in exist
 ‘(My) older brother is in Tokyo.’

In (B2), ‘(my) brother’ singles out a member of the previously given set, hence, the contrastiveness, *x*, not *y*. In the matrix *f*-structure, the predicate is not focused and the NP-*ga* is the narrow focus.

5.3 Restrictive focus NP-*ga*: $[\{x_{foc}, \dots\}_{top}]-GA_{foc}$ [predicate]

Restrictive focus is distinguished from contrastive focus because the elements of the set are not clearly defined, only restricted (Erteschik-Shir 2007). In Japanese, NP-*ga* is the unmarked form for this type of focus. The subordinate *f*-structure is identical to that of topic NP-*wa*; for both, elements are selected from a restricted but unspecified set (see 5.5 below). An example is given in (19).

- (19) A tomodachi-de dareka ryuugakushita?
 friend-among anyone studied.abroad
 ‘Did any of your friends study abroad?’
- B tanaka-ga ryuugakushita $[\{Tanaka_{foc}, \dots\}_{top}]-GA_{foc}$
 Tanaka-NOM studied.abroad
 ‘Tanaka studied abroad.’

The element is selected from a set that is contextually restricted but not clearly defined, such as one’s friends; therefore, this is distinguished from contrastive focus (Erteschik-Shir 2007). In (19B), ‘Tanaka’ is selected from a contextually restricted set of B’s friends. It should be noted that, because the set is not clearly defined in this focus type, the complement of the selected set is not eliminated; therefore, there may be other friends who studied abroad, besides Tanaka. For example, the sentence in (19B) can be followed by a separate sentence ‘And Suzuki studied abroad also’.

5.4 Non-contrastive (broad) focus NP-*ga*: *x*-GA_{foc} [predicate]_{foc}

With broad-focus NP-*ga*, a sentence typically represents sentence-focus. In this focus type there is no contrastiveness involved; therefore, there is no bi-level *f*-structure for this type, as exemplified by the subject NP in (20).

- (20) senshuu tomodachi-ga nihon-kara kita *tomodachi*-GA_{foc}
 last.week friend-NOM Japan-from came
 ‘A friend came from Japan last week.’

5.5 Topic NP-*wa*: [$\{x_{\text{foc}}, \dots\}_{\text{top}}$]-WA_{top} [predicate]_{foc}

Lastly, topic NP-*wa* deserves a more detailed discussion. Contrary to the dichotomic distinction of two types of *wa*'s, topic and contrastive, I claim a common underlying property of *wa*, which is rooted in the selection of (a) particular element(s) of a given set. What separates the “topic” NP-*wa* from the “contrastive” one is the unspecified-set reading for the former. The elements of a set are not overtly specified for topic NP-*wa*'s; thus, the subordinate f-structure for the NP is identical with that for restrictive focus NP-*ga*. Both involve selection of particular elements from a restrictive, but unspecified, set. The integration of the two types of NP-*wa*'s is motivated by discourse-based observations (Suzuki 1995, Shimojo 2005) that *wa* is predominantly used for either an overt contrastive relationship or a shift topic, which involves a selection of a new topic to be presented in contrast with the previous one. In Japanese, zero anaphora is preferred for continuation of the same topic without contrastiveness involved. Furthermore, it has been observed in Shimojo (2005) that, when a speaker refers to a continuing topic overtly (rather than through zero anaphor) in the conversation, a bare NP with no post-nominal marking is the preferred form, unless there is contrastiveness involved in the reference. Overall, these discourse-based observations point to the particular property of NP-*wa*'s; they represent a specialized type of topic, which is not captured by the notion of givenness or non-focus.

An example of topic NP-*wa* is given in (21). As shown by the subordinate focus for the subject NP-*wa*, the topic *wa* is inherently contrastive, with an implicit contrast with the other elements of a contextually unspecified set.⁶

- (21) ima watashi-no ani-wa tookyoo-ni sundeimasu
 now I-LK older.brother-TOP Tokyo-in living
 ‘(My) older brother lives in Tokyo now.’

[$\{watashi\text{-}no\ ani_{\text{foc}}, \dots\}_{\text{top}}$]-WA_{top}

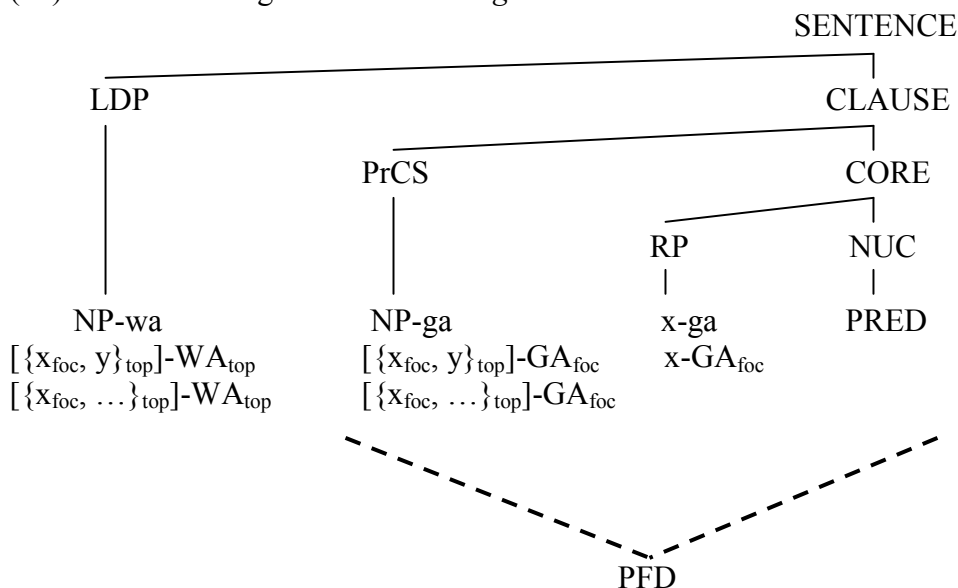
As in the case of restrictive focus, the set is not clearly defined in this topic type; therefore, the complement of the selected set is not eliminated. For example, the sentence in (21) can be followed by a sentence ‘And my younger sister lives in Tokyo also’. On the other hand, this is not possible in the case of contrastive NP-*wa*, where the set is clearly defined. For example, it is very awkward to continue after (16B) with ‘And my younger sister lives in Tokyo also’.

6. NP-*wa* and NP-*ga* in RRG clause structure

The focus structures proposed for the range of NP-*wa* and NP-*ga* thus far lead to the RRG representations shown in (22).

⁶ Note that in Lambrecht's example given in (3) earlier, the subject NP-*wa* is given in parentheses, by which I assume Lambrecht implies the degraded acceptability for the overt NP-*wa* in the particular context. In this example, zero anaphora for the subject is clearly preferred since there is no contrastiveness involved.

(22) Default assignment of NP-*wa/ga* in LSC



By default, NP-*wa* is outside the potential focus domain [PFD] and NP-*ga* is (part of) the actual focus of the sentence (NP-*ga* in PrCS is always the narrow-focus of the sentence). The common property of *ga* in all positions is the focus in the matrix f-structure. It is the narrow focus if there is a subordinate focus, i.e. if contrastiveness arises. On the other hand, the inherent property of *wa* is the topic in the matrix f-structure (hence, outside the PFD) and the required set representation, whether the contrastiveness is explicit or implicit. The association of contrastive NP-*wa*'s with the LDP, which is outside the PFD, can be demonstrated by a truncation test as follows.

For a contrastive topic, the selection of an element per se (i.e. the contrastive topic NP alone) does not constitute the most informative part of the sentence with respect to the purpose of the utterance; therefore, the sentence results in unacceptability (due to incompleteness) in the given context if the NP alone remains by the truncation. This is shown in (23b), in contrast with the full sentence given earlier in (16b).

- (23) a watashi-wa ani-to imooto-ga imasu
 I-TOP older.brother-and younger.sister-NOM exist
 'I have an older brother and a younger sister'
 b # ani-wa
 older.brother-TOP
 '(My) older brother.'

For a contrastive focus NP-*ga*, on the other hand, the same truncation is acceptable which shows that the remaining NP-*ga* is the most informative part of the sentence, as exemplified by (24B2), which is the truncated version of (18B2).⁷

⁷ Of course, the truncated sentences are incomplete without the predicate; therefore, they are informal (or sloppy) sounding. But these acceptable fragments still make sense in the given context, unlike the unacceptable contrastive topic ones.

- (24) A1 gokyoodai-wa?
 siblings-TOP
 ‘(How about your) siblings?’
- B1 ani-to imooto-ga imasu
 older.brother-and younger.sister-NOM exist
 ‘(I) have an older brother and a younger sister’
- A2 sorede donata-ga tookyoo-ni irassharu no?
 and who-NOM Tokyo-in exist Q
 ‘And who is in Tokyo?’
- B2 ani-ga
 older.brother-NOM
 ‘(My) older brother (is in Tokyo).’

This is also the case with a restrictive-focus NP-*ga*. The NP can remain by truncation, as shown in (25B), which is the truncated version of (19B).

- (25) A tomodachi-de dareka ryuugakushita?
 friend-among anyone studied.abroad
 ‘Did anyone of your friends study abroad?’
- B tanaka-ga
 Tanaka-NOM
 ‘Tanaka (studied abroad).’

Thus, the observation above can be summarized as follows.

(26)

Contrastive topic: [$\{x_{\text{foc}}, y\}_{\text{top}}$]-WA_{top}

$\{x_{\text{foc}}, y\}_{\text{top}}$ alone is not informative for the purpose of the utterance, hence WA_{top}

Contrastive/restrictive focus: [$\{x_{\text{foc}}, y\}_{\text{top}}$]-GA_{foc}, [$\{x_{\text{foc}}, \dots\}_{\text{top}}$]-GA_{foc}

$\{x_{\text{foc}}, y\}_{\text{top}}$ alone is informative for the purpose of the utterance, hence GA_{foc}

I should note that the overall structural representations which I presented in (22), NP-*wa* in a LDP and NP-*ga* in a PrCS or the CORE, are not new since these structural assignments were proposed in Shimojo (1995) as discussed earlier. However, the current proposal captures the details that were missed in the previous work. First, the proposed bi-level f-structure captures the subtypes of NP-*wa* and NP-*ga* combined with the clause structure, as shown in (22). More importantly, the proposed representations account for the topic-focus ambivalence of contrastive NP-*wa*’s. While their topic property is captured by the matrix f-structure (top), their focus property is captured by the subordinate f-structure (foc). Also, the shared topic property is structurally reflected by being hosted by a LDP. Furthermore, the *default* structural and functional representations proposed in (22) provide the means to account for the extended use of NP-*wa* and NP-*ga*, which achieve particular pragmatic effects. The marked use of these NPs include NP-*wa* used in a PrCS and a RP inside the CORE, and NP-*ga* used as a non-focus RP and a subject RP of certain types of predicates which normally take NP-*wa* for subject. These are discussed in the following sections.

7. Marked use of NP-*wa*

7.1 *Wa* in PrCS

Perhaps the most peculiar, but possible, use of *wa* is for a narrow-focus NP in a PrCS, as exemplified by (27B'). In the answer to the question, the NP-*ga* is the default form to represent the narrow-focus, as shown in (B); however, NP-*wa* in (B') achieves a particular pragmatic effect as follows.

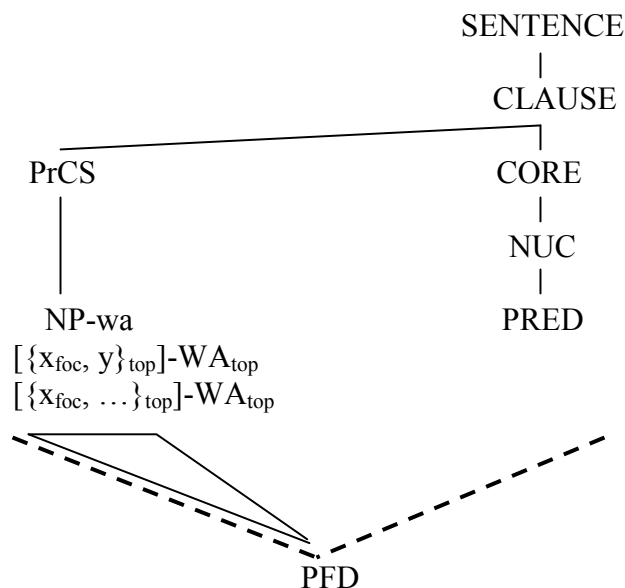
(27) (At a party)

- A dare-*ga* baakuree-no gakusee?
 who-NOM Berkeley-LK student
 'Who are Berkeley students?'
- B karera-*ga* baakuree-no gakusee desu
 they-NOM Berkeley-LK student COP
 'They are Berkeley students.'
- B' karera-*wa* baakuree-no gakusee desu
 they-TOP Berkeley-LK student COP
 'They are Berkeley students (I don't know about others).'

This peculiar use of *wa* has been described as *anti-exhaustive listing* by Kuroda (2005). According to Kuroda, if a NP-*ga* is used as expected for the contrastive focus, there is an 'only x' (exhaustive listing) reading, which conforms to the Gricean maxim of quantity, i.e. "make your contribution as informative as is required (for the current purposes of the exchange)" (Grice 1975: 45). On the other hand, if a NP-*wa* is used, the speaker is not giving a description of the situation (a *thetic judgment* in Kuroda's characterization) as expected for a NP-*ga* sentence. With the use of *wa* (which represents a *categorical judgment*), the speaker has committed himself only to the proposition that 'they are Berkeley students' only with respect to 'they'. This speech act implicates that the speaker leaves the possibility of others 'being Berkeley students' open, hence, anti-exhaustive listing implicature.

In RRG with the f-structure representations proposed in the present study, the observed anti-exhaustive listing effect is explained as follows. The PrCS is associated with a contrastive or restrictive subordinate f-structure due to the default contrastive or restrictive focus NP-*ga*; thus, the subordinate f-structure of NP-*wa* does not bring out a particular effect for the PrCS. However, since a PrCS is a narrow focus position, the matrix f-structure of NP-*wa* achieves marked defocusing, from the narrow-focus to the predicate-focus. In other words, the sentence is presented as if it has predicate-focus, i.e. predication for the given entity. For this reason, the defocusing effect brings out an 'at least' reading, as in (27B') 'As for them, they are Berkeley students' without any reference to entities which are not selected for the predication.

- (28) NP-*wa* in PrCS
Defocusing effect on PrCS due to WA_{top} (shift to predicate-focus)



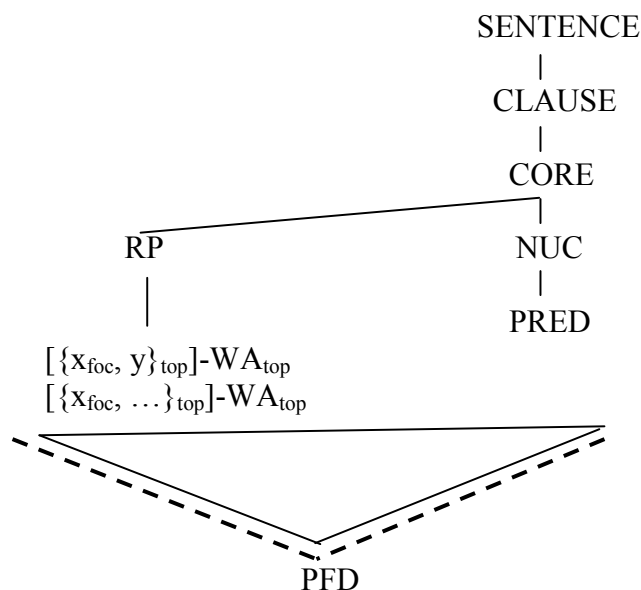
7.2 *Wa* for a focus RP

The use of NP-*wa* for a focus RP achieves an effect similar to NP-*wa* in a PrCS discussed above; however, the effect involves contrastiveness as well as a focus shift in this case. An example is given in (29B').

- (29) A baffaroo doo?
 Buffalo how
 ‘How is Buffalo?’
 B yuki-ga huru yo.
 snow-TOP fall FP
 ‘It snows (lit. snow falls).’
 B’ yuki-wa huru yo.
 snow-TOP fall FP
 ‘It snows (but it’s not that cold, etc.)’

In response to the question in (29A), the answer represents sentence-focus, hence the NP-*ga* as default, as shown in (B). If a NP-*wa* is used, it brings out a marked contrastive reading, as indicated by the translation for (B'). In this case, there are two separate effects imposed by the use of *wa*. First, we expect a similar defocusing effect as in the case of NP-*wa* in PrCS, but to a lesser degree. It is a shift from sentence-focus to predicate-focus, due to the switch in the matrix f-structure from GA_{foc} to WA_{top} . Because the predicate is in focus to begin with, the focus shift is not expected to be a major shift as in the use of *wa* in PrCS, i.e. a switch from narrow-focus to predicate-focus. Yet, due to the imposed predicate-focus (i.e. predication for a selected entity), the focus shift brings out the ‘at least’ reading, such as ‘it snows at least’. In addition, we expect a marked contrastive reading imposed by the use of *wa*, because a broad-focus NP-*ga* is not associated with the subordinate f-structure. The RRG representation is given in (30).

- (30) NP-*wa* for focus RP
 Defocusing effect on RP due to WA_{top} (shift to predicate-focus) AND
 Contrastive effect on RP due to $\{x_{foc}, y/\dots\}_{top}$



The same argument applies to the use of *wa* for a non-subject RP. Consider the examples given in (31)-(33). The sentence in (31) exemplifies the default post-nominal marking for the nominative and accusative arguments. In the sentence in (32), on the other hand, the object argument is marked with *wa*. It is well known that *wa* marking for a non-subject brings out a marked contrastive reading. I claim that the imposed contrastiveness is due to the subordinate f-structure associated with the NP-*wa*. Also, there is an ‘at least’ reading for the sentence, which is again explained by the defocusing on the NP-*wa*, and thus, the focus shift to the other elements of the sentence. These dramatic effects are partly suppressed if the NP-*wa* is preposed in the LDP, as shown in (33). The LDP is a non-focus position; therefore, there is no defocusing effect caused by the NP-*wa* in LDP. However, the contrastive reading is still there, which is the default for a NP-*wa*, whether explicit or implicit, depending on the context.

- (31) taroo-ga ringo-o tabeta
 Taro-NOM apple-ACC ate
 ‘Taro ate an apple.’
- (32) taroo-ga [ringo-wa]_{RP} tabeta
 Taro-NOM apple-TOP ate
 ‘Taro ate an apple (at least, but didn’t eat an orange, etc.)’
- (33) [sono ringo-wa]_{LDP} taroo-ga tabeta
 the apple-TOP Taro-NOM ate
 ‘The apple, Taro ate.’

I should note that so-called “presentational” sentences are not ideal hosts for NP-*wa*’s, even for their marked use. In (34), the predicate *iru* ‘there is/exist’ requires the hearer’s

attention to the entity that is introduced. Similarly, in (35), the indefinite subject NP ‘man’ solicits a context in which it is the first-time introduction of the referent. In both cases, a focus shift away from the referent is not desirable. Also, there is no contrastiveness, either explicit or restrictive, involved in either sentence.

- (34) mite, mukooni kuma-ga/*wa iru!
 look over.there bear-NOM/TOP exist
 ‘Look, there is a bear over there!’

With an indefinite NP (difficult set reading)

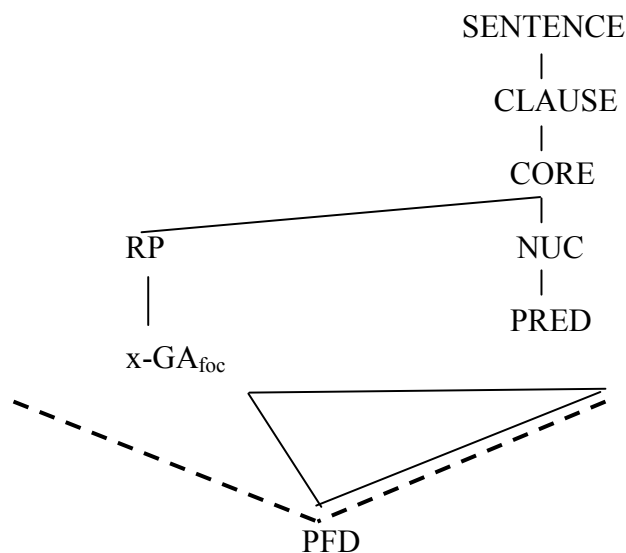
- (35) kinoo otoko-ga/*wa taihosareta
 yesterday man-NOM/*TOP was.arrested
 ‘Yesterday, a man was arrested.’

8. Marked use of NP-*ga*

8.1 *Ga* for a non-focus RP

Just like a NP-*wa* may be used when it is not normally used, the marked use of a NP-*ga* is possible, but drawing focus on the NP. One obvious possibility is the use of *ga* for a non-focus RP, which is outside the actual focus domain, though it is within the CORE. The RRG representation is given in (36).

- (36) *Ga* for a non-focus RP
 Focusing effect on the RP due to GA_{foc}



The marked use of NP-*ga*'s is best suited to the re-introduction of a referent that has already been given in the preceding discourse. Because the referent is previously given, it would represent non-focus of the sentence (hence, NP-*wa*, or even zero anaphora if the overt reference is not needed, would normally be used). However, the re-introduction is more effectively achieved if the NP is presented as focused (hence, the *ga* marking).

In fact, it has been observed in narrative discourse that NP-*ga*'s are used for previously introduced referents in order to achieve particular discourse effects. Maynard (1987) argues that such use of *ga* is part of the narrator's *staging* strategy, in which a NP-*wa* is used for "thematized" main story characters and the avoidance of *wa*-marking (hence, the use of NP-*ga* if subject) is the strategy of non-thematizing. In essence, non-thematized referents are presented as if new, as they become the focus of attention. Consider the part of a story given in (37), which is a slightly modified example taken from Maynard (1987: 60).

- (37) a mukasi, mukasi, arutokoro-ni oziisan to obaasan-**ga** orimasita
 once.upon.a.time one.place-in old.man and old.woman-NOM existed
 'Once upon a time, there were an old man and an old woman in some place.'
- b sizukana yama-de hutari-**wa** siawaseni kurasiteorimasita
 quiet mountain-in two-TOP happily were.living
 'In a peaceful mountain, the two were living happily.'
- c aruhi oziisan-**ga** yama-e sibakari-ni ikimasita
 one.day old.man-NOM mountain-to firewood.collecting-to went
 'One day, the old man went to the mountain to collect firewoods.'

The first two sentences of the discourse represent the usual referential progression from *ga* to *wa*; a NP-*ga* is used for the initial introduction of a referent and a NP-*wa* is used for a subsequent mention. In (37.c), 'old man' is re-introduced afresh with the *ga*-marking, which goes well with the temporal transition in the story between (b) and (c).⁸

8.2 NP-*ga* for particular types of predicates (constant/habitual state of affairs)

One final point to be discussed is the use of NP-*ga* with a particular range of predicates. It has been pointed out by Kuno (1973) that the *neutral description* reading (i.e. the sentence-focus reading) is not allowed for a NP-*ga* used with a predicate that denotes a constant or habitual state of affairs. If a NP-*ga* is used with such a predicate, it imposes a narrow-focus reading (i.e. *exhaustive-listing* in Kuno's term) on the NP, as exemplified by (38). In other words, a NP-*wa* is the default form for the subject of this type of predicate, as shown in (39), unless a narrow-focus is intended.

- (38) [taroo-*ga*]_{PrCS} gakusee da
 Taro-NOM student COP
 'It is Taro that is a student.'
- (39) [taroo-*wa*]_{LDP} gakusee da
 Taro-TOP student COP
 'Taro is a student.'

⁸ Watanabe (1990) observes a similar use of NP-*ga* in narrative discourse, in which story characters are re-introduced with the *ga* marking to signal a perspective shift, such as a switch of viewpoint from the narrator to a particular character in the story. Furthermore, Yamaguchi (2007) points out that self-contained facts are often presented without topic NP's, as observed in newspaper articles, such that every sentence is presented afresh, being disconnected from each other. Such discourse is likely to contain more NP-*ga*'s even for the same referents.

The contrast observed in (38) and (39) is described in RRG terms as follows. The type of verb discussed here is inherently associated with an argument NP which is the topic in the matrix f-structure (i.e. $[\{x_{\text{foc}}, y\}_{\text{top}}]_{\text{top}}$ or $[\{x_{\text{foc}}, \dots\}_{\text{top}}]_{\text{top}}$); thus, the NP is assigned to a LDP by default. However, if a NP-*ga* replaces the NP-*wa*, the change involves a switch from *top* to *foc* only for the matrix f-structure. The subordinate f-structure (i.e. $\{x_{\text{foc}}, y\}_{\text{top}}$ or $\{x_{\text{foc}}, \dots\}_{\text{top}}$) remains since it is part of the property of NP-*ga* also (in other words, the subordinate f-structure does not have to be eliminated by the switch since NP-*ga* is compatible with it). Due to the subordinate f-structure, the NP-*ga* is assigned to a PrCS for the narrow-focus reading.

9. Linking

Before concluding the present study, I incorporate the current proposal into the linking algorithm which I previously proposed to capture the discourse-based alternation of argument forms in Japanese. As I discussed previously (Shimojo 1995, 2009), Japanese uses the full range of CORE-external positions: LDP, PrCS, post core slot [PoCS], and right detached position [RDP]. On the basis of the findings in spoken Japanese (Shimojo 2005), the following form-function relationship has been proposed.

Table 1: Form-function relationship: nominative and accusative arguments

Functional Properties	Grammatical Means
Givenness	Morphology
Identifiable	Zero anaphor
Unidentifiable	- <i>ga</i> (nominative), - <i>o</i> (accusative)
Contrastiveness	
Contrastive	- <i>wa</i>
Absolute	Zero particle
Saliency	Syntax
Default	Pre-verbal argument
Defocusing	Post-verbal argument

What is relevant to the present study is the CORE-external positions at the left periphery, i.e. LDP and PrCS, and these are the default periphery positions, as indicated in Table 1 (see under “saliency”). The CORE-external positions at the right periphery, PoCS and RDP, are associated with arguments by which the referents are defocused in cataphoric discourse; therefore, the right periphery in Japanese is associated with a marked discourse function. In Shimojo (2009: 132-137), I proposed the linking algorithm to capture argument assignment to PoCS and RDP. Given the bi-level f-structure representations proposed in the present study, the linking algorithm from semantics to syntax is revised in (40).

(40) Linking algorithm: semantics \rightarrow syntax

1. Construct the semantic representation of the sentence, based on the logical structure of the predicator.
2. Determine the actor and undergoer assignments, following the actor-undergoer hierarchy.
3. Determine the morphosyntactic coding of the arguments.
 - a. Select the privileged syntactic argument, based on the privileged syntactic argument selection hierarchy and principles.

- b. Assign the arguments the appropriate case markers and/or postpositions.
 - (i) If an argument has the f-structure $[\{x_{\text{foc}}, y\}_{\text{top}}]_{\text{top}}$ or $[\{x_{\text{foc}}, \dots\}_{\text{top}}]_{\text{top}}$, or if it is a matrix focus but needs to be defocused, assign *wa* to the argument(s). If the referent(s) requires absolute specification, assign no post-nominal marking.
 - (ii) If an argument is a matrix focus, or if it is a matrix topic but needs to be focused, assign appropriate case markers, based on the case assignment rules for accusative constructions.
 - (iii) If neither (i) nor (ii) above applies, use no morphosyntactic instantiation for the argument (i.e. zero anaphora).
4. Select the syntactic template(s) for the sentence, following the syntactic template selection principle (and language-specific qualifications).
 - a. If an argument has no syntactic instantiation, use appropriate truncated syntactic templates.
 - b. Use the LDP for a *wa*-marked argument, but place it in a RP for an argument of a sentence-focus. Use the PrCS for a *ga* or *wa*-marked narrow-focus argument.
 - c. If the referent(s) of the argument(s) requires defocusing, use PoCS (default) or RDP (for a right detached topic).
5. Assign arguments to positions in the syntactic representation of the sentence. If there is no syntactic position to assign the argument(s) to, link them directly with the corresponding referents in the discourse representation structure.

The major points of revision are how the arguments are assigned the *wa* or *ga*-marking (40.3.b.i, ii) and how the left and right periphery positions are all incorporated (40.4.b, c). For the former, the f-structure representations for the different NP forms are specified in the algorithm. The linking also captures the marked use of *wa* and *ga* for the specified (de)focusing effects. The interplay of the left and right periphery is captured such that the left periphery is the default topic and focus position and the arguments are linked with the right periphery only for the specialized function, defocusing of referents.

Likewise, the linking algorithm from syntax to semantics is revised in (41), which incorporates the f-structure specifications.

(41) Linking algorithm: syntax → semantics

1. Obtain an appropriate clause structure upon parsing the sentence.
2. Determine the macrorole(s) and other core argument(s) in the clause.
3. Retrieve from the lexicon the logical structure of the predicate in the nucleus of the clause. If the clause structure contains no predicate, retrieve it from the presupposition discourse representation structure.⁹
4. Link the arguments determined in step 2 with the arguments determined in step 3 until all core arguments are linked. If an argument is marked with *wa*, assign either $[\{x_{\text{foc}}, y\}_{\text{top}}]_{\text{top}}$ or $[\{x_{\text{foc}}, \dots\}_{\text{top}}]_{\text{top}}$, as determined by the discourse representation structure, to the argument in the focus structure projection, and establish a contrastive link in the discourse representation structure with a proper referent. If the argument is zero-marked, cancel existing contrastive links if any. If there is a *ga*-marked argument in the PrCS, assign either $[\{x_{\text{foc}}, y\}_{\text{top}}]_{\text{foc}}$ or $[\{x_{\text{foc}}, \dots\}_{\text{top}}]_{\text{foc}}$, as determined by the discourse representation structure, to the argument in the focus structure projection. If there is an unlinked argument position(s) in the semantic representation, retrieve the corresponding referent(s) directly from the discourse representation structure (for zero anaphora).

⁹ This is required for zero anaphora for verbs (Shimojo 2008).

5. If there is an element in the PoCS or RDP, assign it in the remaining unlinked argument position in the semantic representation of the clause. Defocus the corresponding referents in the discourse representation structures and if the argument is *wa* or zero marked, follow the procedure in step 4.
6. If the f-structure specification for an argument retrieved by the *wa/ga*-marking does not match the actual focus structure projection determined by the discourse representation structure, the former overrides. Adjust the current discourse representation accordingly.

The revised linking algorithm from syntax to semantics includes the retrieval of the f-structure specifications for the pragmatically specialized arguments, i.e. a *wa*-marked argument and a *ga*-marked narrow-focus argument in the PrCS (41.4). Thus, the linking is done in connection with the focus structure projection as well as the discourse representation structure. Furthermore, the linking accommodates the marked use of NP-*wa/ga* so that the actual focus structure projection is adjusted accordingly to reflect the anticipated pragmatic effects (41.6).¹⁰

10. Conclusion

I hope to have demonstrated that bi-level f-structure representations provide a useful means to lay out the functional properties associated with the observed range of topic and focus types in Japanese and shed light on the remaining issues in the previous proposals. In particular, the framework successfully pinpoints the functional ambivalence associated with contrastive topic and focus. On one hand, they are both topic as they need to be linked with the preceding context, but on the other hand, they are both focus due to the contrastive property. It is noteworthy that what is assigned to the left periphery is a topic-like entity, whether contrastive/restrictive topic or contrastive/restrictive focus, and this conforms to the cross-linguistic observation that the left periphery is essentially a topic position (Erteschik-Shir 2007). Furthermore, the *default* f-structure properties of the different topic and focus types serves as the basis to account for their extended use, which leads to focus shifting in the focus structure projection. These irregular uses of topic and focus NPs may be a reflection of the speaker's "manipulation" of focus structure in discourse, yet, it needs to be captured in the grammar.

¹⁰ Although the exact mechanism for such adjustment in the discourse representation structure will need to be examined in a future study, File Change Semantics (Heim 1982, Vallduví 1990, Portner & Yabushita 1998) may serve as a possible framework. Focus shifts proposed in this study are essentially manipulations in the way information is "filed". See Lee & Shimojo (2010) for an application of the framework to topic marking in Japanese and Korean.

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Argument structure of compound verbs in Japanese: Against “bottom-up” models*

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Previous accounts of the argument structure of V1-V2 compound verbs in Japanese (e.g. Fukushima 2005) use a “bottom-up” approach in which two argument structures of the component verbs are combined to obtain the argument structure of the compound verb. This implies that a set of rules must be posited to resolve the complex mechanism involved in the merging process, irrespective of which theoretical notion (e.g. protoroles) is drawn upon. This paper offers an alternative account, working within the framework of Role and Reference Grammar (Van Valin 2005). It hypothesizes that only one component of an analyzable compound verb contributes arguments; the other functions as a modifier which does not participate in argument contribution. Since there is one set of arguments per compound, no complication is involved in linking syntactic and semantic representations.

Keywords: argument structure, compound verb, logical structures

1. Introduction

This paper offers a Role and Reference Grammar (RRG) account of the argument structure of lexical compound verbs in Japanese. Compound verbs constitute a large word group in the Japanese lexicon, numbering at least 1,800 (Morita 1990). They comprise two verbs, V1 and V2, morphologically bound as exemplified below:

- | | | | | |
|-----|----|---------------------|-------------|-------------------|
| (1) | a. | <i>osi-akeru</i> | push-open | ‘open by pushing’ |
| | b. | <i>oi-mawasu</i> | chase-turn | ‘chase around’ |
| | c. | <i>suberi-otiru</i> | slide-fall | ‘slip down’ |
| | d. | <i>oti-tuku</i> | drop-attach | ‘calm down’ |

V1 occurs in a non-finite form and V2 carries tense.¹ No elements can intervene between the two, and together, they function as one word (cf. Kageyama 1993). The large majority of component verbs are currently in use as independent verbs in Modern Japanese. The patterns of combinations vary (cf. Tagashira 1978, Matsumoto 1998), from those with a representative relation borne by the two verbs, such as cause-result (1a), action-direction (1b), or manner-result (1c), to a combination in which their relation is difficult to specify, (1d).

The fact that compound verbs contain two source verbs combined diversely raises the question of how to represent their argument structures. Linguists have proposed various accounts (Fukushima 2005, 2008; Gamerschlag 2000; Kageyama 1993; Matsumoto 1996, 1998; Naumann and Gamerschlag 2003). While they disagree in terms of which specific notions should be invoked, such as protoroles (Fukushima 2005, 2008) and unaccusativity

(Kageyama 1993), the proposals are strikingly similar in one respect. That is, they are all “bottom-up” (cf. Spencer 2006) in the sense that the argument structure of a compound verb is assumed to be a composite of the argument structure of each component verb.

One such model can be seen below: Figure 1 shows a representation of the argument structure of *nomi-aruku* drink-walk ‘bar-hop’ (Kageyama 1993).

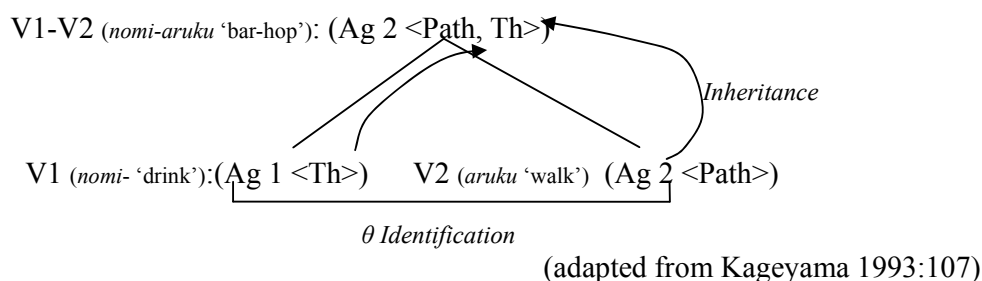


Figure 1: Example of an argument structure

In this model, the argument structure contains information on semantic roles such as Agent and Theme; the bottom row shows the argument structures of the component verbs, and the top row contains the argument structure of the compound verb. Note that two operations are posited as *θ identification* and *inheritance*. The former recognizes the identity of two arguments (V1’s Agent 1 and V2’s Agent 2); the latter allows selected arguments (V1’s Theme, V2’s Path, and the *θ identified* V2’s Agent 2) into the argument structure of the compound verb.

As implied by this representation, bottom-up models require dually staged rules to successfully merge the components’ argument structures into one in such a way as to account for all arguments. The first rule is to match the identity of two arguments belonging to distinct component verbs, and the second is to designate which arguments can be permitted into or prohibited from appearing in the argument structure of the compound verb.

This paper approaches the argument structure of compound verbs rather differently. Unlike the bottom-up models which recognize both component verbs as the argument-contributing source, it hypothesizes that only one verb contributes arguments: a compound verb is analyzed into a base verb and its affix, and only the base verb functions as an argument contributor.

The paper is organized into the following sections. Section 2 describes the distinction of the base verb and its affix; Section 3 proposes the logical structures (LS) of compound verbs; Section 4 turns to linking; and Section 5 constitutes a conclusion.

2. On ‘affixes’

2.1. Libben (2005)

It may be a truism that bottom-up models regard component verbs on a par with full verbs: a full verb is supposed to have its own argument structure, and all component verbs have an argument structure. Put otherwise, the underlying assumption is that two full verbs constitute a compound.

A psycholinguistic study of English nominal compounds by Libben (2005), however,

hints at an alternative way to view compounds. Libben (2005:277) discusses the semantic transparency of English noun-noun compounds, using *Batman* as an example:

Consider the morpheme *bat*. As associated with a particular comic book and movie hero, this morpheme has acquired considerable frequency as an initial compound constituent. *Batman* drives a *batmobile* and a *batboat*, and rides a *batcycle*. He flies a *batplane*, climbs a *batrope*, wears a *batcape*, and works in a *batcave*. All of these compounds are transparent if one posits that the bound compound modifier *bat-*, rather than the free morpheme *bat*, is the one that is employed in compound processing.

This suggests that a free morpheme *bat* has a prefix counterpart *bat-*, a modifier of the base noun. This prefix assumes the function of a special type of possessive, which not only identifies the possessor of the referent of the base noun as *Batman* but turns the referent into a uniquely engineered item to suit the needs of its owner, *Batman*.

Given Libben's (2005) treatment of a component element of a compound as a "compound modifier" rather than a "free morpheme", we can inspect Japanese compound verbs in a new light – viewing one member of the compound as a modifier, which no longer functions as a full verb: i.e. as a decategorized element.

As summarized in (2), this paper proposes that compound verbs are either analyzable or unanalyzable.²

(2) Proposal:

-Analyzable:	Base Verb	+	Affix
	{ -Argument Contributing -Semantic Head }		{ -Argument Non-contributing -Modifier }

-Unanalyzable: One word

The analyzable type consists of a base verb and an affix where the base verb is the sole argument contributor, and the affix is non-argument contributing. For example, in (3a), *kodomo* 'child' is an argument of the base verb, V1 *hurue-* 'shiver'.

- (3) a. *Kodomo-ga hurue-agat-ta.*
 child-NOM³ shiver(V1)-rise(V2)-PAST
 'The child shivered considerably.'
- b. *Taoru-ga te-kara suberi-oti-ta.*
 towel-NOM hand-from slip(V1)-fall(V2)-PAST
 'The towel fell slipping from my hand.'
- c. *Kunan-o nori-kit-ta.*
 difficult.situation ride(V1)-cut(V2)-PAST
 '(We) overcame the difficult situation.'

In (3b), *taoru* 'towel' and *te* 'hand' are arguments of the base verb, V2 *oti-* 'fall'. Unanalyzable compound verbs, meanwhile, are inherently one word; therefore, the compound

as a whole contributes one set of arguments. In (3c), *kunan* ‘difficult situation’ is an argument of the compound *nori-kiru* ‘overcome’.

Base verbs are distinguished from affixes on the basis of a semantic criterion: when an element can serve as the semantic head, it is taken as the base verb, and otherwise, as an affix. By “semantic head”, I mean a superordinate of the compound verb in the sense of Lyons (1977: 292)(cf. Cruise 1986:89, Fabb 1998:67). For example, in (3a) *hurue-agaru* ‘shiver hard’, V1 is the semantic head because the compound event *shivering hard* is subsumed by the V1 event *shivering*. In (3b) *suberi-otiru* ‘fall slipping’, V2 is the semantic head because the compound event *falling slipping* is subsumed into the V2 event *falling*. In (3c) *nori-kiru* ‘overcome’, neither V1 nor V2 can be the semantic head because the compound event *overcoming* cannot be subsumed by either the V1 event *riding* or the V2 event *cutting*. In such a case, the compound is classed as unanalyzable. Since unanalyzable compounds are a verb listed with a regular logical structure just like a simplex verb such as *waraw-* ‘laugh’ **do** (x, [**laugh**’ (x)]), the focus hereinafter is on the logical structures of the analyzable type.

3. Logical structures of analyzable compound verbs

First, we consider the compounds whose base verb is V2. Then, we turn to those whose base verb is V1.

3.1. Prefix(V1)-base verb(V2)

When the base verb is V2, compound verbs are divided into two types: those not having an activity component in their LS and those with one. The former will be discussed using an intransitive-intransitive combination and the latter with a transitive-transitive combination.

3.1.1. Intransitive[activity]-intransitive[change-of-state]

Among intransitive-intransitive compounds, the most common is the combination where V1 is an activity verb and V2 is a change-of-state verb as shown in (4):

- | | | | | |
|-----|----|----------------------|------------|----------------------|
| (4) | a. | <i>suberi-otiru</i> | slip-fall | ‘fall slipping’ |
| | b. | <i>mai-agaru</i> | dance-rise | ‘rise as if dancing’ |
| | c. | <i>huki-deru</i> | blow-exit | ‘spout’ |
| | d. | <i>hasiri-modoru</i> | run-return | ‘return running’ |

The peculiarity of these compound verbs is that V1 and V2 disagree in their aspectual specification: V1 is atelic, being an activity verb; V2 is telic, being a change-of-state verb. Despite this discrepancy, the meaning of the compound verb can be obtained successfully. If V2 is punctual as in (4a), the event denoted by V1 is construed as an activity that occurs before the change of state sets in. In (4a) *suberi-otiru* slip-fall ‘fall slipping’, the slipping action is construed as the manner exhibited by the entity during the unbounded phase before it makes contact with the reference object, when the change of state takes place. If V2 is an accomplishment verb as in (4b), the activity expressed by V1 is construed as co-progressing with the event denoted by V2 before reaching the terminal point. In the case of *mai-agaru* dance-rise (4b), it is construed such that the dancing-like action takes place concurrently with the rising motion.

The question is how the LSs of these compound verbs should be represented. One possibility is to construct the LS in a bottom-up fashion: i.e. to combine the LS of V1 and V2.

(5) A hypothetical LS for *suberi-otiru* slip-fall:

- LS of an active accomplishment:

- Note that (5a) is practically the same as the LS of an active accomplishment (cf. (5b)). This implies that the Aktionsart class of the compound verb is active accomplishment, and it is predicted that the compound verb will be screened as an active accomplishment verb if the diagnostic tests for Japanese (Toratani 2007: 57) are applied. Table 1 shows the results.

	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
	(<i>-te-i</i>)	(citation form)	(<i>for</i> phrase)	(durative <i>in</i> phrase)	(<i>-owar</i>)	(<i>yukkuri</i>)	(<i>zyozyo-ni</i>)
Active accomplishment	Progressive	Future	No	Yes	Yes	Yes	No
Achievement	Resultative state	Future	No	No	No	No	No
Compound: <i>suberi-otiru</i> slip-fall	Resultative state	Future	No	No	No	No?	No?
Base verb: <i>oti-</i> ‘fall’	Resultative state	Future	No	No	No	No	No

(6) a. *Nimotu-ga yuka-ni suberi-oti-te-i-ru.*
 parcel-NOM floor-DAT slip-fall-L-exist-NPAST
 'The parcel is on the floor (fallen) slipping [Resultative]/
 *The parcels are falling slipping onto the floor [*Progressive].'

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A solution can be glimpsed in the behavior of English verbs. Some English activity verbs can become a source for an adverb taking the *-ingly* ending. A cursory survey of British National Corpus (<http://www.natcorp.ox.ac.uk/>) includes the following activity related *-ingly* adverbs:

- (7)
- | | | |
|----|-------------------|-------------------|
| a. | <i>flowingly</i> | (< <i>flow</i>) |
| b. | <i>swimmingly</i> | (< <i>swim</i>) |
| c. | <i>sobbingly</i> | (< <i>sob</i>) |
| d. | <i>jokingly</i> | (< <i>joke</i>) |
| e. | <i>shakingly</i> | (< <i>shake</i>) |
| f. | <i>laughingly</i> | (< <i>laugh</i>) |

Taking (7a) as an example, *flowingly* can occur in a sentence such as “*She danced flowingly across the stage...*”,⁴ referring to a manner of motion.

Though the part-of-speech category of the source item is verb, since the words ending in *-ingly* are adverbs, they will be represented as a one-place predicate following the standard RRG treatment of manner *ly*-adverbs such as *clumsily* and *passionately* (Van Valin 2005:49, cf. Jackendoff 1972). If a sentence *She danced passionately* should be represented as in (8a), then *She danced flowingly* should have a comparable representation (8b).

- (8)
- | | | |
|----|-----------------------------------|--|
| a. | <i>She danced passionately.</i> : | passionate' (do' (<i>she</i> , [dance' (<i>she</i>)])) |
| b. | <i>She danced flowingly.</i> : | flowing' (do' (<i>she</i> , [dance' (<i>she</i>)])) |

The phenomena observed in (4) are analogous to those in (7) in that an element, originally a verb, goes through decategorization but still gives rise to a fairly transparent meaning predictable from the source verb. If *-ingly* adverbs are to be represented as one-place predicates, it seems reasonable to posit that the prefixes in (4) are also represented as one-place predicates. For instance, (4a) would look like (9c).

- (9)
- | | | |
|----|--------------------------------|--|
| a. | <i>suber-</i> ‘slip’ | : do' (z, [slip' (z)]) → [affixation] |
| | → <i>suberi-</i> (V1) | : slipping' (w), w=LS |
| b. | <i>oti-</i> ‘fall’ (V2) | : INGR fallen' (x) |
| c. | <i>suberi-oti-</i> ‘slip-fall’ | : slipping' (INGR fallen' (x)) |

That is, when an activity verb *suber-* ‘slip’ occurs as a prefix *suberi-*, it becomes non-predicating, and when it is combined with the base verb, the LS of the prefix is realized as a one-place predicate, taking scope over the LS of the base verb as shown in (9c).

3.1.2. Transitive-transitive[change-of-state]

The following examples are illustrative of transitive-transitive combinations.

- | | | | | |
|------|----|-------------------------------------|--------------|----------------------|
| | | <u>Activity V1</u> | | |
| (10) | a. | <i>osi-akeru</i> | push-open | ‘open by pushing’ |
| | b. | <i>haki-atumeru</i> | sweep-gather | ‘gather by sweeping’ |
| | c. | <i>humi-katameru</i> | stamp-harden | ‘harden by stamping’ |
| | | <u>Causative change-of-state V1</u> | | |
| | d. | <i>kiri-saku</i> | cut-split | ‘split by cutting’ |
| | e. | <i>tokasi-ireru</i> | melt-put | ‘melt into’ |
| | f. | <i>tigiri-toru</i> | tear-remove | ‘remove by tearing’ |

Transitive-transitive compounds comprise two types: those with an activity V1 (10a-10c) and those with a causative change-of-state V1 (10d-10f). The base verbs are change-of-state in both cases.

Let us consider the first combination, taking *osi-akeru* push-open (10a) as an example. (11) provides a sentence example of the compound:

- (11) *Keekan-ga* *doa-o* *osi-ake-ta.*
 police-NOM door-ACC push-open-PAST
 ‘The policeman opened the door by pushing it.’

A more precise rendition of this sentence would be *The policeman opened the door by hurling himself hard against the door* to highlight the point that the door’s opening motion synchronizes with the policeman’s pushing action. In other words, in this scene, the causing event is construed as the pushing action. If this is translated into the LS, it would look like (12c) where the LS of *os-* ‘push’ is realized as the causing action of *ake-* ‘open’.

- (12) a. *os-* ‘push’ (V1) : **do'** (x, [**push'** (x, y)])
 b. *ake-* ‘open’ (V2) : [**do'** (x, Ø)] CAUSE [BECOME **open'** (y)]
 c. *osi-ake-* (V1-V2) : [**do'** (x, [**push'** (x, y)])] CAUSE [BECOME **open'** (y)]

(12c) shows that the pushing activity causes the opened state. Stated more generally, V1 in this example renders specific the unspecified content of the general activity, **do'** (x, Ø).

A similar point can be observed with the second combination, using *kiri-saku* cut-tear ‘tear by cutting’.

- (13) *Kazue-ga* *nuno-o* *kiri-sai-ta.*
 Kazue-NOM cloth-ACC cut-tear-PAST
 ‘Kazue tore the cloth by cutting.’

V2 *sak-* ‘tear’ basically means to separate something into two by force. When combined with V1 *kir-* ‘cut’, the compound conveys that the separation is performed by cutlery such as a knife or by scissors. V1 contributes to specifying the content of the causing action but does not change the meaning of the compound into ‘to cut’.⁵ In other words, V1 does not affect the meaning of the caused state, though it may be implied that the edge of the torn part is clean.

The important point is that the event denoted by the compound entails a synchronization of two actions: the elongation of the tear and the actor’s cutting action, where the latter causes the former. To translate this into the LS, the causing event by V1 *kir-* ‘cut’, which is a causative change-of-state verb, must be reinterpreted as an activity verb. Referred

(14) a. *kir-* ‘cut’ (V1) : [**do'** (x, Ø)] CAUSE [INGR **cut'** (y)]
 → [atelicization] → *kiri-*: **do'** (x, [**cut'** (x, y)])
 b. *sak-* ‘to tear’ (V2) : [**do'** (x, Ø)] CAUSE [BECOME **turn'** (y)]
 c. *kiri-sak-* (V1-V2) : [**do'** (x, [**cut'** (x, y)])] CAUSE [BECOME **turn'** (y)]

To iterate the main point, when the base V2 contains an unspecified activity in the LS, V1 specifies the content of the activity, enriching the causative LS, and when the base V2 does not contain an unspecified activity in the LS, V1 occurs as a one-place predicate, providing additional information of the event denoted by V2.

Let us now turn to the case where the base verb is V1 to which a suffix V2 attaches. This type includes compound verbs such as (15).

- In these compound verbs, V2s are grammaticalized involving a shift in meaning: e.g. in (15a), *agar-* means ‘to rise’ as a lexical verb but expresses degree ‘hard/considerably’ as V2.

As for these V2s, Kageyama (1993:109) has proposed a one-place predicate type representation. Though actual representation is not shown, he (*ibid.*) states that V2 *-agar* takes Ev as an argument into which V1's argument structure is embedded. It is assumed that this description refers to the representation below:

- Following this idea (Kageyama 1993), the compound verbs in (15) are posited to have a representation of a one-place predicate **considerable'** (w), w=LS: (17) provides the representation for *hurue-agar-* 'shiver hard', and (18) *hage-agar-* 'become bare considerably'.

- The (a) examples contain V1's LS, and the (b) examples, the compound's LS. Note that the LS of *-agar* takes scope over different parts of the LS: in (17b), it takes the entire activity

As the sole argument of an activity predicate, the reference phrase (RP) *kodomo* ‘child’ is selected as the actor following the Actor-Undergoer Hierarchy (Van Valin 2005: 126). Following the privileged syntactic argument selection hierarchy (Van Valin 2005: 100), the actor is selected as PSA, receiving the nominative case (ibid.:108).

Turning to the second type (the activity specifier type), Figure 3 shows linking for (13), repeated below as (21).

- (21) *Kazue-ga nuno-o kiri-sai-ta.* (= (13))
 Kazue-NOM cloth-ACC cut-tear-PAST
 ‘Kazue tore the cloth by cutting.’

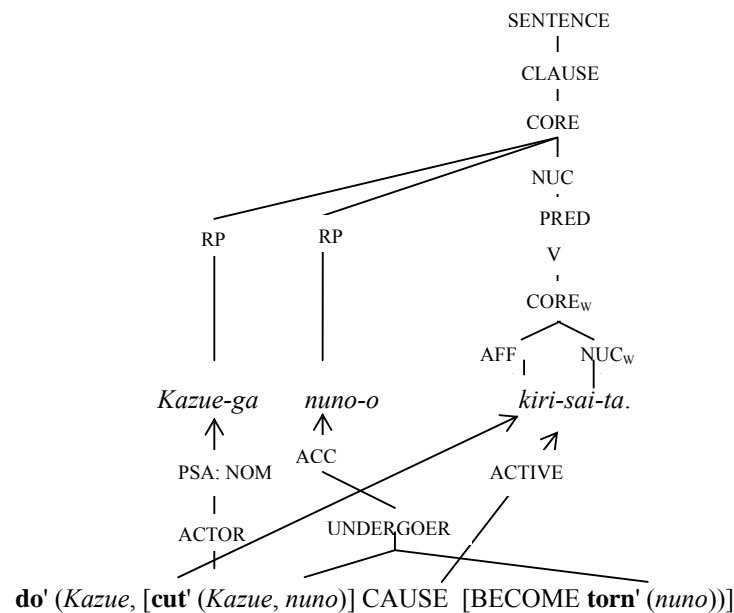


Figure 3: Linking for Sentence (21)

The case assignment follows the same steps as the above example except that (21) contains two arguments. *Kazue* is selected as the actor, and *nuno* ‘cloth’ as the undergoer following the Actor-Undergoer Hierarchy (Van Valin 2005: 126). Since this is an active voice construction, the actor receives the nominative case, and the undergoer the accusative (ibid.: 108).

The present proposal analyzes the LS of a compound verb as maintaining the LS of the base verb, with the affix not contributing any arguments. Therefore, there is no anomaly or deviation in terms of linking syntax and semantics.

Before closing, it would be useful to touch on predictiveness. As Fukushima (2005) notes, no principled account predicts that a verb can combine with a given verb when its synonym cannot:

- (22) a. *sasoi-dasu* entice-put.out ‘lit. entice (someone) out’
 b. *sasoi-ireru* entice-put.in ‘lit. entice (someone) in’
 c. * *maneki-dasu* beckon-put.out ‘(intended) entice (someone) out’
 d. *maneki-ireru* beckon-put.in ‘lit. beckon (someone) in’
 (adapted from Fukushima 2005: 572-573)

(22) shows four combinations, created by two V1s and two V2s. The V1s, *sasow-* ‘invite/entice’, and *manek-* ‘invite/beckon’ are synonyms. The former can be combined with *dasu* ‘put out/let out’ (22a) or *ireru* ‘put in/let in’ (22b), whereas the latter can be combined only with *ireru* ‘put in/let in’ (cf. (22c) vs. (22d)), showing that one combination is nonexistent.

A detailed lexical semantic study of combinatory possibilities of verbs would be necessary to fully consider the issue of productivity. In this respect, the paper finds the line of research presented in Uchiyama *et al.* (2005) promising.

5. Conclusion

This paper shows that the argument structure of compound verbs in Japanese can be accounted for by drawing on a theory that does not posit the level of syntactic argument structure, namely RRG. It argues that a simpler account can be obtained by abandoning the premise that the component verb always brings full-fledged information as a full verb into a compound verb structure. For one thing, because there is no merging of two argument structures, no rules are needed to govern a merging operation. For another, since there is one set of arguments per compound, case-marking works just as it does for arguments of a simplex verb, requiring no special treatment.

The paper looks at a limited number of V1-V2 combinations, and more cases must be investigated to verify that the proposal contained herein can be maintained. Moreover, it considers only Japanese compound verbs; future studies will determine the discussion can be extended to include V-V compounds in other languages.

Notes

* I thank audience members at the RRG09 conference for their questions and comments. I am solely responsible for any shortcomings and errors in this paper.

¹ The examples in (1) occur in the citation form, and tense is not separated from the base to simplify the representation.

² The basic idea of this grouping comes from Nagashima (1976) and Kageyama (1993), both of whom offer four-way grouping; this paper collapsed the four subtypes to create two.

³ The following abbreviations are used in this paper: ACC=accusative, DAT=dative, L=linker, NOM=nominative, and NPAST=non-past.

⁴ The source of this example is: <http://en.wiktionary.org/wiki/flowingly> accessed on February 26, 2010.

⁵ If the meaning of the compound were changed into the meaning of ‘cut’, there should be a shift in aspectual construal but this is not the case: while an event of *kir-* ‘cut’ takes place punctually, the event of *sak-* ‘tear’ and the event of the compound both involve temporal durativity. For instance, a phrase *roopu-o kiru* ‘to cut a rope’ means to make a long object into two shorter objects, separating it orthogonally (and thus punctually), whereas *roopu-o saku* ‘to tear a rope’ and *roopu-o kiri-saku* ‘to cut-tear a rope’ yield a durative reading such that a long object becomes two long objects being separated horizontally along the axis.

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Head-marking languages and linguistic theory

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Abstract:

In her path-breaking 1986 paper Johanna Nichols proposed a typological contrast between head-marking and dependent-marking languages. An important difference concerns the relationship of RP arguments to the verb: they are for the most part obligatory in dependent-marking languages, whereas they are for the most part optional in head-marking languages. Nichols showed that this distinction in clausal syntax is part of a larger, systematic contrast between two ways of indicating the syntactic relation between a head and its dependent(s): the marker of the relationship can occur on the dependent, i.e. dependent-marking, or it can occur on the head, i.e. head-marking. Nichols argues that even though the syntactic relations between the head and its dependents are the same in both types of language, i.e. in this case ‘subject of’, ‘direct object of’, and ‘indirect object of’, the syntactic ‘bond’ between them is not the same; in dependent-marking languages it is one of government, while in head-marking languages it is one of apposition. This distinction raises an important question for linguistic theory: how can this contrast, government vs. apposition, which can show up in all of the major phrasal types in a language, be captured? The purpose of this paper is to explore the various approaches that have been taken in an attempt to capture the difference between head-marked and dependent-marked syntax in different linguistic theories. The basic problem that head-marking languages pose for syntactic theory will be presented, and then generative approaches will be discussed. The analysis of head-marked structure in Role and Reference Grammar will be presented.

Keywords:

head-marking

dependent-marking

Lakhota

lexical integrity

I have argued that the theoretical apparatus of classical, traditional, structural and formal grammar is heavily based on dependent-marked syntax. If the hypothesis of the universally preferred nature of head-marked patterns holds true, then we will have to recognize that describing the world's languages in standard theoretical terms is not merely Eurocentric distortion, but in fact forces the unmarked grammatical structure into a framework devised for the marked type.

—Nichols (1986:116)

1. Introduction¹

In her path-breaking 1986 paper, Johanna Nichols proposed a typological contrast between head-marking and dependent-marking languages. Previous scholars as far back as the first part of the nineteenth Century had observed that languages with extensive agreement on the verb, regardless of whether they had case marking on RPs² or not, seem to work differently from Indo-European languages, which have little or no agreement and often have case marking on RPs. This was first noted with respect to clause structure and the relationship between RP arguments and the verb, as illustrated in (1) and (2).³

- (1) a. Die Lehrerin gab der Frau das Buch. German
the.NOM teacher give.PAST the.DAT woman the.ACC book⁴
‘The teacher gave the book to the woman.’
b. *Gab.
‘[She] gave [it to her].’

¹ I would like to thank Michael Boutin, Greville Corbett, Nick Enfield, Dan Everett, Jean-Pierre Koenig, Anja Latrouite, Ranko Matasović, Dejan Matić, Karin Michelson, John Roberts and two anonymous referees for comments on earlier drafts. Earlier versions were presented at the University of Wuppertal and at the 2009 Role and Reference Grammar Conference. This research was supported in part by a fellowship from the Max Planck Society.

² ‘RP’ stands for ‘reference phrase’, which is the category of referring expressions, which are typically headed by nominals, hence the traditional label ‘NP’. See Van Valin (2008) for detailed discussion.

³ Lakhota is a split-intransitive language, and therefore the bound markers on the verb indicate actor vs. undergoer, not subject vs. object. ‘Subject’ in Lakhota is [S, A], i.e. the single argument of an intransitive verb, regardless of whether it is actor or undergoer, and the actor of a transitive verb. The ‘Ø’ glossed ‘INAN’ indicates that transitive verbs entail a specific undergoer argument, even though inanimate undergoers are not explicitly indicated morphologically on transitive verbs.

⁴ Abbreviations: A ‘actor’, ABS ‘absolutive’, ACC ‘accusative’, ANIM ‘animate’, CL ‘clitic’ CLS ‘classifier’, CMPL ‘complementizer’, DAT ‘dative’, DM ‘dependent-marking’, ECS ‘extra-core slot’, ERG ‘ergative’, F ‘feminine’, FRM ‘formative’, FUT ‘future’, HM ‘head-marking’, IF ‘illocutionary force’, INAN ‘inanimate’, IRR ‘irrealis’, LDP ‘left-detached position’, LSC ‘layered structure of the clause’, NMR ‘non-macrorole’, NOM ‘nominative’, PAST ‘past tense’, PoCS ‘post-core slot’, PrCS ‘pre-core slot’, PRO ‘pronoun’, Q ‘interrogative marker’, RDP ‘right-detached position’, U ‘undergoer’.

- (2) a. *Wičhaša ki hená wówapi ki Ø- wičhá- wa- k'u.* Lakhota
 man the those book the INAN-3plANIMU-1sgA-give
 'I gave the book to those men.'
 b. *Wičháwak'u.*
 'I gave it to them.'

An important difference concerns the relationship of RP arguments to the verb: they are for the most part obligatory in dependent-marking languages, whereas they are for the most part optional in head-marking languages. In (1) from German, a dependent-marking language, it is not the case that all of the RP arguments can simply be omitted, as (1b) shows. In Lakhota, by contrast, all of the RP arguments of the verb can be omitted, and the result is a fully grammatical sentence, as (2b) shows. Immediate recoverability from context is not a condition on the appropriateness or grammaticality of (2b). Various linguists, e.g. Humboldt (1836), Boas (1911), Van Valin (1977), among others, have suggested that this contrast is indicative of two different ways that RPs can be related to the verb, but no conclusions regarding differences in the grammar as a whole between the two types of language were drawn until Nichols addressed the issue. She showed that this distinction in clausal syntax is part of a larger, systematic contrast between two ways of indicating the syntactic relation between a head and its dependent(s): the marker of the relationship can occur on the dependent, i.e. dependent-marking, or it can occur on the head, i.e. head-marking.⁵

In discussing examples analogous to (1) and (2) from Chechen (dependent-marking) and Abkhaz (head-marking), Nichols argues that even though the syntactic relations between the head and its dependents are the same in both languages, i.e. in this case subject, direct object, and indirect object, the syntactic 'bond' between them is not the same (1986:108). She maintains that while all of the RPs in (1a) and (2a) are subcategorized for by the verb, those in (1a) are also governed by the verb, as indicated by the case assigned to them, but those in (2a) are not; rather, they are related through the "looser link of apposition, specification or the like" (1986:108) between, in the case of (2a), *wičhaša ki hená* 'those men' and the prefix *wičha-* 'them' on the verb. The RPs in (2a) are optional, as the (b) examples show.

This distinction raises an important question for linguistic theory: how can this contrast, government vs. apposition, which can show up in all of the major phrasal types in a language, be captured? The answer is not obvious, for the following reason:

It turns out that many fundamental analytic notions of formal and theoretical syntax are designed for dependent-marked relations; some of them even seem to be based on an implicit assumption that grammatical relations are normally dependent-marked. (Nichols 1986:114-5)

The kind of standard constituent-structure analysis provided by many formal theories is designed to represent government relations of the kind found in (1a) but not the appositional relations found in (2a). The purpose of this paper is to explore some of the various approaches that have been taken in an attempt to capture the difference between head-marked and dependent-marked syntax in different linguistic theories. In section 2 the basic problem

⁵ It should be noted that there are two other types as well: languages which mark both the head and dependent, which are called 'double-marking' languages, and languages which lack inflectional morphology and mark neither the head nor dependent in these constructions.

that head-marking languages pose for syntactic theory will be presented, and then in section 3 generative approaches will be discussed. In section 4 the analysis of head-marked structure in Role and Reference Grammar [RRG] (Van Valin 2005) will be presented. RRG is rather different from generative theories in a number of ways, and it is unusual among linguistic theories in that the consideration of head-marked phenomena informed the development of the theory right from its conception. Section 5 presents the outline of an RRG approach to morphology and discusses the morphological representation of ‘sentential words’ like (2b). Conclusions will be presented in the final section.

Two points need to be made before going further. First, it is possible simply to deny that the contrast between head-marking and dependent-marking is real or substantive and to analyze head-marking languages as just dependent-marking languages with lots of agreement and phonologically null case and pronominals. On this view, (1a) and (2a) would have the same structure, ignoring word order differences, with the case assigned to the RPs in (2a) being phonologically null. Crucially, (2b) would have the same structure as (2a), with the overt RPs replaced by phonologically null pronouns. Such an analysis was proposed for Lakhota in Williamson (1984), for example.⁶ This discussion will not concern itself with this type of approach; rather, it will focus on approaches which recognize the distinction and try to accommodate it theoretically. Second, the analysis of head-marking languages in the generative literature has been entwined with the discussions of non-configurationality, on the one hand, and polysynthesis (Baker 1996), on the other. While there are non-configurational languages that are head marking, there are also purely dependent-marking non-configurational languages, e.g. Dyirbal (Dixon 1972), Jiwari (Austin & Bresnan 1996), and there are head-marking languages which lack most or all of the traits of non-configurational languages. While all polysynthetic languages seem to be head- (or double-) marking, there are head-marking languages which are clearly not polysynthetic. Mayan languages such as Jakaltek (Craig 1977), for example, are consistently head-marking; however, they have relatively rigid syntax, lack most of the salient properties of non-configurational languages, and are not polysynthetic. Hence the focus in this discussion will be on head-marked morphosyntax, independent of issues of non-configurationality or polysynthesis.

2. Some challenges posed by head-marked syntax

As argued in Van Valin (1977, 1985, 1987), a key feature of the syntax of head-marking languages is that syntactic operations (or constructions, depending upon one’s theoretical perspective) target the syntactic features realized by the bound argument markers on the verb or auxiliary; whether there are any independent RPs is irrelevant. This can be illustrated with the Lakhota obligatory control constructions in (3) and (4).

- (3) a. Wówapi ki ma- Ø- nú i- bl- úthe.
 book the stem-INAN-steal stem-1sgA-try⁷
 ‘I tried to steal the book.’

⁶ See Van Valin (1985, 1987) for detailed critiques of this type of approach.

⁷ Many Lakhota verbs take their actor and undergoer affixes as infixes; this is true of both *iyútha* ‘try’ and *manú* ‘steal’ in these examples. The part of the stem before the infix will be glossed ‘stem’.

- a'. Ma- Ø- nú i- bl- úthe.
stem-INAN-steal stem-1sgA-try
'I tried to steal it.'
- b. *(Wówapi ki) ma- Ø- wá- nu i- bl- úthe.
book the stem-INAN-**1sgA**-steal stem-1sgA-try
Intended: 'I tried to steal the book.'
- (4) a. Hokšíla ki hená wówapi ki ma- Ø- nú- wičha- wa- ši.
boy the those book the stem-INAN-steal-3plANIMU-1sgA-tell
'I told those boys to steal the book.'
- a'. Wówapi ki ma- Ø- nú- wičha- wa- ši.
book the stem-INAN-steal-3plANIMU-1sgA-tell
'I told them to steal the book.'
- a''. Ma- Ø- nú- wičha- wa- ši.
stem-INAN-steal-3plANIMU-1sgA-tell
'I told them to steal it.'
- b. *(Hokšíla ki hená) wówapi ki ma- Ø- Ø-nú- pi- wičha- wa- ši.
boy the those book the stem-INAN-**3A**-steal-**PL**-3plANIMU-1sgA-tell
Intended: 'I told those boys to steal the book.'

The construction in (3) is obligatory subject control with *iyútha* 'try'. There are no independent pronouns in (3a) or (b); what is crucial, as the ungrammaticality of (3b) shows, is that the 1sg actor affix must be omitted on the linked verb. (The relevant affix and its gloss are in boldface.) This is even clearer in (4), an object-control construction. In (4a) the undergoer of -ši 'tell', which is also the understood actor of *manú* 'steal', is indicated twice, once by the independent RP *hokšíla ki hená* 'those boys' and once by the bound argument marker -wičha- 'them' prefixed to -ši.; the RPs in (4a) can be omitted, as (4a', a'') illustrate. Just as in (3), the crucial feature of the construction is the lack of actor marking on the linked verb. The ungrammaticality of (4b) is caused by the overt third-person plural subject marking on the linked verb *manú* 'steal' ('3plA' is signaled by the combination of zero marking plus the suffix -pi). Whether the independent RP *hokšíla ki hená* 'those boys' occurs or not is irrelevant to the grammaticality of the sentence. This is in striking contrast to the English translations of these two sentences, in which it is the independent RP which must be omitted in the construction. Thus, in the syntax of head-marking languages, the instantiations of arguments that are relevant for constructions such as these are the bound argument markers, not independent RPs. The challenge that these languages pose for linguistic theory, then, is how to devise an analysis of these phenomena that works for both types of languages. More specifically, given the definitions of argument positions that theories have, how can argument positions be occupied by bound forms in languages like Lakhota but independent RPs in languages like German? Moreover, what is the status of independent RPs in head-marking languages?

These examples also raise an important issue for morphological theory. How is it that the syntax can apparently target elements inside of a word? Is this a violation of the principle of lexical integrity? If a single phonological word can function as a clause, what is the relationship between the internal structure of the word and the internal structure of the clause it instantiates?

3. Generative approaches

The primary approach to these problems that has been taken within generative frameworks is the pronominal argument hypothesis, first proposed in Jelinek (1984). In Jelinek's analysis, developed in a Government and Binding [GB] framework, the 'agreement' markers on the verb or auxiliary occupy argument positions in the phrase-structure tree, with the verb+auxiliary+markers constituting the S/IP; independent RPs are 'adjuncts' outside of this core structure in what are in effect dislocated positions. Under this analysis, a more accurate translation of (2) would be 'Those men, the book, I gave it to them' (cf. Jelinek 1984:50). The pronominal argument hypothesis has received widespread acceptance in the generative literature and has been adapted into Minimalism.⁸ Pensalfini (2004) proposes a version of the pronominal argument hypothesis grounded in a principle of Distributed Morphology to the effect that "open class words are composed of at least two component morphemes, an encyclopedic component and a purely formal component" (2004:360-1). In Pensalfini's model, the formal component of an argument, its phi-features, occurs in an argument position in the core clause, which

consists of that part of the phrase marker dominated by the maximal projection of the highest functional element... This projection dominates all core argument positions as well as that of the syntactic predicate-head (prototypically V). (2004:381)

The elements instantiating the encyclopedic component occur in positions outside the core clause, just as in the Jelinek version.

There are two immediate problems. First, detached elements are set off by intonation breaks, and there are normally no intonation breaks after the RPs in (2a). It is possible to set an RP off with an intonation break at the beginning of a sentence, in a typical left-dislocation construction, but this is not the case in (2a). Second, and more significant, if independent RPs are in dislocated positions, then this predicts that they should not appear in embedded clauses, since left- and right-dislocated elements do not occur in embedded clauses. Yet independent RPs are perfectly fine in embedded clauses in Lakota, as (5a, b) show.

- (5) a. [Hokšíla ki hená wówapi ki manú-wičha-wa-ši ki] slol- Ø- yá- ye.
 boy the those book the steal-them-I-tell CMPL stem-INAN-2sgA-know
 'You know that I told those boys to steal the book.'

- b. [Hokšíla ki hená wówapi wə manúwīchwāši ki hé] líla wakhá
 boy the those book a steal-them-I tell the that very sacred
 'The book that I told those boys to steal is very sacred.'

The construction in (5a) is an object complement, while (5b) is a head-internal restrictive relative clause; in both, independent RPs are fully grammatical, which strongly argues that they are not in detached, dislocated positions but rather are fully integrated into the clause. There are further, technical difficulties with this analysis in terms of GB theory (Van Valin

⁸ LFG rejects it, proposing instead an analysis of the person-number inflections on the verb as being agreement in (2a) but as licensing a full f-structure and null pronominal in (2b) (Bresnan 2000). So from an LFG perspective, the person-number inflections never directly count as an argument.

1987), which need not concern us here. Thus, while the various versions of the pronominal argument hypothesis treat the ‘agreement’ markers as the true syntactic arguments, capturing a central feature of head-marking clausal syntax, the status of the independent RPs, remains problematic.

4. The Role and Reference Grammar approach

The ‘founding question’ of RRG was, “what would linguistic theory look like if it started from the analysis of languages like Tagalog, Dyirbal and Lakhota, rather than from the analysis of English?” Thus, right from the start, the syntax of Lakhota and therefore of head-marking languages figured prominently in the development of RRG. Van Valin (1977) grappled with expressing the intuition that in Lakhota RPs agreed with the verb, i.e. they occurred in slots set up by the morphological marking on the verb, rather than the verb agreeing with one or more RPs accompanying it, as in English.⁹ The breakthrough in the analysis of Lakhota came with Nichols (1983), an early version of Nichols (1986); this intuition was now clearly expressed in her head-marking vs. dependent-marking opposition, and the result was the analysis of Lakhota presented in Van Valin (1985). In that paper it was argued that the bound markers on the verb are the true core arguments, but the status of the independent RPs was not adequately resolved. The theory at that point, based on Foley & Van Valin (1984), had only a very basic version of the layered structure of the clause [LSC], which had not been adequately formalized. If the independent RPs are not in core argument positions, then the only option for them was to be in the periphery with adjuncts. This is problematic for a number of reasons. First, true adjuncts in Lakhota may be adpositionally marked and are not cross-referenced on the verb.¹⁰ Hence the independent RPs which can be interpreted as arguments by virtue of verbal cross-reference are qualitatively different and are not adjuncts. Second, the periphery in RRG is defined as containing elements which are not related to the logical structure of the predicate in the nucleus, the one exception being constructionally-specified ‘demotion’ of a core argument such as the actor in a passive construction, and consequently cross-referenced RPs are incompatible with the periphery by definition.

The formalization of the LSC came in Johnson (1987), and the expansion of the LSC to include core-external positions (pre-core slot, left- and right-detached positions) was developed in Van Valin (1993).¹¹ Given the availability of these extra-core syntactic positions, the question arose as to whether the independent RPs in sentences like (2a) occupy one of them. The most obvious candidate would be the left-detached position [LDP], the position for left-dislocated elements; it is possible to have more than one LDP in a sentence, as in Japanese.

⁹ Van Valin (1978) proposed a typological contrast between noun-oriented (e.g. English) and verb-oriented (e.g. Lakhota) grammatical systems. It was never published. There is a possible historical connection between the early RRG analysis and the later pronominal argument hypothesis. In spring semester 1978 I gave a seminar based on Van Valin (1977, 1978) at the University of Arizona, and Eloise Jelinek, then a graduate student, was a participant in the seminar.

¹⁰ The term ‘adjunct’ is used in two senses in the literature: non-argument, which is the sense used in RRG, and element adjoined to another, which is the sense used by Jelinek and Pensalfini. Since phrasal adjunction can be to any maximal projection, the question arises as to which node(s) the adjoined RPs are attached. The claim that they are in detached or dislocated positions suggests that they are CP adjuncts, given that they have different properties from WH-moved XPs in the specifier of CP. Binding facts support this conclusion; see below.

¹¹ There is also a post-core slot; it was originally proposed in Shimojo (1995).

However, two objections to this analysis have already been given in section 2, and one more may be added here. WH-expressions cannot occur in the LDP, as (6) illustrates.

- (6) a. *As for which boy, did Mary see him?
 b. *As for who, did he see Mary?
 c. *As for where, did John see Mary?

This follows from two factors: first, detached elements are highly topical, and WH-expressions are focal. Second, the scope of the interrogative illocutionary force [IF] operator is the clause, and the LDP is outside of the clause and therefore outside of the scope of the IF operator; consequently, it cannot host WH-expressions. If the independent RPs in (2a) were in detached positions, this would predict that they could not be replaced by WH-expressions, which is not the case, as (7) shows.

- (7) a. Tuwá wówapi ki Ø- wičhá- Ø- k'u he?
 who book the INAN-3plANIMU-3sgA-give Q
 'Who gave them the book?'
 b. Wičhaša ki hená táku Ø- wičhá- ya- k'u he?
 man the those what INAN-3plANIMU-2sgA-give Q
 'What did you give those men?'

The fact that WH-expressions can occur in both of these positions shows that they cannot be detached positions but rather must be clause-internal.

The other candidate core-external position is the pre-core slot [PrCS], the position in which WH-expressions occur in languages like English and German; non-WH-expressions can occur in this position as well.

- (8) a. [CLAUSE [PrCS What] did [CORE you give to those men?]]
 b. [CLAUSE [PrCS That analysis] [CORE I don't buy.]]
 (9) a. [CLAUSE [PrCS Was] hat [CORE der Mann gekauft?]]
 what has the man bought
 'What did the man buy?'
 b. [CLAUSE [PrCS Eine Flasche Wein] hat [CORE der Mann getrunken.]]
 a bottle wine has the man drunk
 'A bottle of wine the man drank.'

In contrast to the LDP, the PrCS is not subject to the same objections. First, the element in the PrCS is not set off by an intonation break, and second, the PrCS is clause-internal, which means it is within the scope of the IF operator. Nevertheless, there are problems with an analysis locating the independent RPs in (2a) in the PrCS. First, there are two RPs in (2a), but there is never more than one PrCS in a clause.¹² Hence one of the RPs in (2a) is still unaccounted for. Second, while it is in principle possible for a PrCS to occur in an embedded clause, they rarely do so, and this seems to be related to the fact that occurrence in the PrCS

¹² Instances of so-called 'multiple WH-movement' do not involve multiple PrCSs; see Eschenberg (1999) for an RRG analysis of multiple-WH questions in Polish.

typically signals that the RP or PP has a special discourse status, often contrastive focus or topic; such a special discourse status is difficult to reconcile with the strongly presupposed nature of most types of embedded clauses.¹³ Thus, the fact that independent RPs freely occur in all types of embedded clauses in head-marking languages, as illustrated in (5), argues against them being in the PrCS.

To summarize, in a head-marking language like Lakhota the bound argument markers on the verb are the true core arguments. A preliminary representation of the LSC of (2b) and a representation of the LSC of its English translation are given in Figure 1.

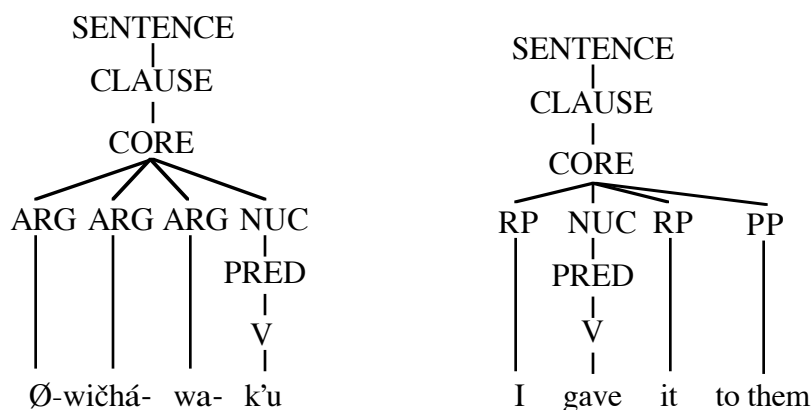


Figure 1: The structure of (2b) (preliminary) and its English equivalent

The structure of the two sentences is similar, morpheme order aside, with the crucial difference being that the elements expressing the core arguments are bound morphemes in Lakhota but free morphemes in English.

In the pronominal argument hypothesis and in the earlier discussions of head-marking in RRG, the bound argument markers are assumed to be pronouns, but this is problematic for several reasons, each having to do with the binding properties of pronouns. First, pronouns in argument positions (as opposed to possessors) cannot be bound by an RP clause-internally; this is well-known and is canonized as ‘Principle B’ of the binding theory in GB. In Jelinek’s analysis, independent RPs are in detached, clause-external positions, and therefore there is no problem with respect to Principle B.¹⁴ In the RRG analysis, on the other hand, the independent RP is clause-internal and therefore cannot bind a true pronoun in an argument position within the same clause; consequently, the bound argument markers cannot be true pronouns. Second, if they were true pronouns, they should only be able to cross-reference definite RPs, since pronouns are themselves definite, as pointed out by Austin & Bresnan (1996). Yet there is no problem with the cross-referencing of indefinite RPs, as (10) shows. In both examples the relevant RP is indefinite and plural, in order to have explicit cross-referencing on the verb; third person singular actor and undergoer do not trigger any overt morphological marking.

¹³ The PrCS occurs in relative clauses with a relative pronoun; it is the location of the relative pronoun. It also occurs in embedded questions, and it provides the slot for the WH-expression, e.g. *John doubts what Mary said*. What is meant here, and what is unusual, is a PrCS in an embedded clause which does not host the subordinator, e.g. **John doubts that the car Bill stole*.

¹⁴ This supports the earlier suggestion (see fn. 10) that the RPs must be adjoined to a node very high in the left periphery, in X-bar terms.

- (10) a. Mathó eyá na- wícha- wa- xʔu
 bear some stem-3plANIMU-1sgA-hear
 ‘I heard some bears.’
 a’. Nawíčhawaxʔu
 ‘I heard them.’
 b. Mathó eyá hí- pi.
 bear some come-PL
 ‘Some bears came.’
 b’. Hípi.
 ‘They came.’

How can the referential nature of the affixes illustrated in (10a’, b’) be reconciled with the indefinite RPs cross-referenced in (10a, b)? The answer lies in the nature of the indefinite articles in Lakhota: there are three sets of indefinite articles, specific-indefinite, as in (10), non-specific indefinite (non-negative) and non-specific indefinite (negative). If the cross-referencing elements are analyzed as instantiating a specific referent, not a definite referent like a true pronoun such as *he*, *she* or *it*, then they would be fully compatible with both definite and indefinite RPs. Moreover, since they are not true pronouns, they are not subject to Principle B and can cross-reference clause-internal RPs. They cannot be anaphors, as they are capable of independent reference, as in (10a’, b’). They thus represent a new kind of referring expression, one that falls between pronouns and anaphors.¹⁵ How is it that they receive a pronominal interpretation in sentences like (10a’, b’)? The interpretation could be the result of a Gricean implicature: the use of the bound form alone to indicate a referent signals to the hearer that the speaker believes that the hearer can identify the referent. Definiteness is often analyzed as a combination of referentiality and identifiability (Lambrecht 1994), and therefore the marker is interpreted as signaling an identifiable referent and thereby functioning as a pronoun.

This analysis would seem to predict that indefinite non-specific RPs, which would be marked by one of the other two types of indefinite articles, would not be cross-referenced on the verb, but this surprisingly is not the case, as (11) shows.

- (11) a. Mathó etá na- wícha- ya- xʔu he?
 bear some stem-3plANIMU-2sgA-hear Q
 ‘Did you hear any bears?’
 a’. Nawíčhayaxʔu he?
 ‘Did you hear them?’/*‘Did you hear anything?’
 b. Lakhóta tuwéni hí- pi- šni.
 Indian no come-PL-NEG
 ‘No Indians came.’ (Rood & Taylor 1996:456)

¹⁵ In GB Binding Theory there is such a hybrid type, the pronominal anaphor exemplified by PRO, which could either be controlled or refer arbitrarily. The Lakhota argument markers are not instances of PRO, as Van Valin (1987) argued in detail, but the notion of ‘pronominal anaphor’ is fitting. The affixes can be bound locally, as in (2a), like an anaphor, or they can refer independently, as in (2b), like a pronoun. The fact that standard binding theories do not include such an overt element may be a reflection of the point made by Nichols that grammatical theory is biased toward the kind of phenomena found in dependent-marking languages.

b'. Hípišni.

'They did not come.'/*'No one came.'

The question operator *he* and the negation operator *-šni* license the non-specific indefinite articles *etá* 'some' in (11a) and *tuwéni* 'no, none' in (11b), respectively; yet the RPs marked by these articles are cross-referenced on the verb. This would seem to call into question the analysis of the cross-referencing elements as being referential. Note, however, that when the question or negation operator occurs with the inflected verb alone, as in (11a', b'), the referential specificity of the argument marker is unaffected. This indicates that in order to suspend the reference of this argument, some additional means beyond the negation or question operator are required, namely the independent RP containing the appropriate indefinite-non-specific article plus the operator. The RP-operator combination cancels the reference of the affix, rendering it non-specific. The function of the construction is to suspend reference of one of the arguments of a predicate, and it does not depend on the presence of any potential cross-referencing morphology. It was mentioned earlier (fn. 4) that inanimate arguments do not trigger any kind of cross-referencing morphology on transitive verbs. Nevertheless, transitive verbs are interpreted as having a specific inanimate undergoer, even if the morphosyntactic features of the argument do not have any exponent, as illustrated in (12a,b).

- (12) a. Ixʔé ki (hená) wə- bl- áke/*wə- wícha- bl- áke.
 rock the (those) stem-1sgA-see/stem-3plANIMU-1sgA-see
 'I saw the/those rock(s).'
- b. Wəbláke.
 'I saw him/her/it/them[INAN]/*them[ANIM].'
- c. Čh á-thipi etá wə- l- áka he? (Rood & Taylor 1996:456)
 wood-house some stem-2sgA-see Q
 'Did you see any houses?'
- d. Čh á-thipi tákuni wə- bl- áke- šni.
 wood-house none stem-1sgA-see-NEG
 'I didn't see any houses.'

Inanimate undergoers are not cross-referenced on the verb, as (12a,b) clearly show, yet the combination of indefinite non-specific article plus operator has exactly the same effect in (12c,d) as in (11), despite the lack of cross-referencing morphology. Hence the purpose of these constructions is to suspend the reference of an argument, and therefore the input to the construction must be a verb form with specific reference to the relevant argument. Thus, there is no contradiction in having these indefinite non-specific RPs cross-referenced on the verb; indeed, the negation and question operators alone cannot suspend the reference of the argument, as (11a', b') show. Thus, it may be concluded that the argument markers are not true pronouns but rather express a specific argument, which may be either a local RP or a discourse antecedent. As suggested in fn. 15, they could be taken to be pronominal anaphors, albeit in a difference sense from the pronominal anaphor (PRO) of GB theory.

The structure proposed for (2b) raises the vexing question of the status of independent RPs in sentences like (2a). There are good reasons to reject the analysis of the independent RPs as being in a dislocated position like the LDP or as being in the PrCS. There are, moreover, good reasons to analyze them as being clause-internal. They are, therefore, core-

external but clause-internal. The LSC can accommodate independent RPs inside the clause but outside the core, and it does this by allowing them to be direct daughters of the clause node, as in Figure 2.

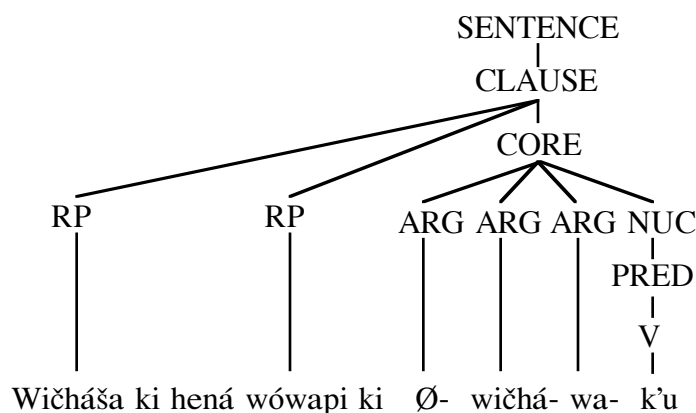


Figure 2: The structure of (2a)

These positions, which we may label ‘extra-core slots’[ECSs], are structurally analogous to the PrCS, in that they are direct daughters of the clause node, but they differ from it in six important ways. First, they are not associated with any special pragmatic or discourse function; they may be topical or focal. Second, there can be more than one of them. Third, they are not positionally restricted. They need not be pre-core; in a verb-initial head-marking language, e.g. Tzutujil (Dayley 1981), they would follow the verb, and in a verb-medial head-marking language, e.g. Nunggubuyu (Heath 1984), they would precede and follow. These post-core positions differ from the post-core slot [PoCS] by their lack of a distinctive discourse function, usually contrastive focus for the PoCS. Fourth, as noted above, because of the distinctive discourse function of the element in the PrCS or PoCS, they are largely restricted to main clauses, while independent RPs occur freely in all types of embedded clauses. Fifth, the PrCS/PoCS can host either arguments or non-arguments (adjuncts), while the independent RPs in ECSs must be instantiations of the arguments of the verb. Adjuncts (non-arguments) occur in a periphery. Sixth, pre- and post-core slots are found in both head-marking and dependent-marking languages, whereas ECSs are found only in head-marking languages. Verb-initial head-marking languages provide a clear contrast between the PrCS and ECSs, as in the following Tzutujil examples (Dayley 1981); the structure of each is given in Figure 3.

- (13)a. X- Ø- uu- ch'ey jar aachi jar iixoq.
 PAST-3ABS-3ERG-hit CLS man CLS woman
 ‘The woman hit the man.’
- b. Jar aachi x- Ø- uu- ch'ey jar iixoq.
 CLS man PAST-3ABS-3ERG-hit CLS woman
 ‘It was the man who the woman hit.’

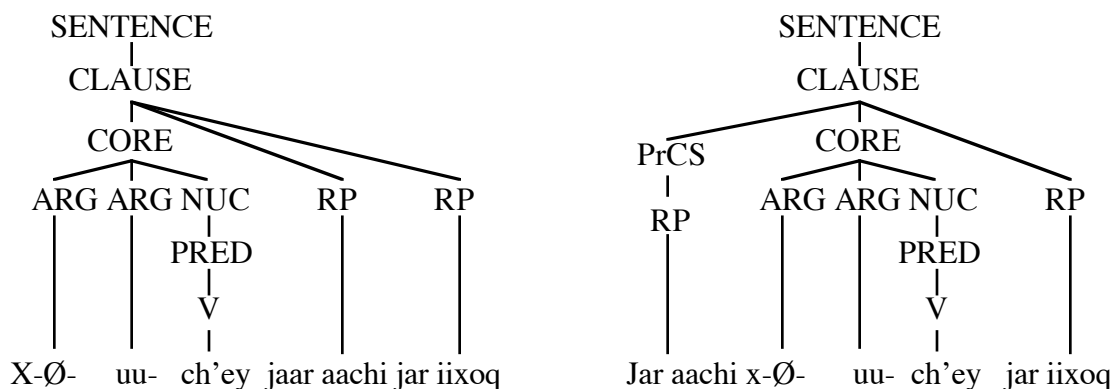


Figure 3: The structure of (13a) and (13b) from Tzutujil¹⁶

The structure in (13a) represents the basic, unmarked transitive clause pattern, with two independent RPs in ECSs following the core. In (13b), on the other hand, one of the arguments has been moved to the PrCS, which signals contrastive focus; in this example, one RP is in the PrCS and the other in a post-verbal ECS.

Thus there seem to be two types of core-external positions, the properties of which are summarized in Table 1.

	PrCS/PoCS	ECS
Special discourse-pragmatic function	Yes	No
Restricted to single instantiation	Yes	No
Positionally restricted	Yes	No
Hosts arguments and adjuncts	Yes	No
Restricted primarily to main clauses	Yes	No
Occurs in both HM and DM languages	Yes	No

Table 1: Comparison of types of extra-core positions

Every language can in principle have an extra-core position in its clause structure; hence the theory allows positions in the clause which are outside of the core and are daughters of the clause node, and these positions can be ‘specialized’ in various ways, yielding complementary sets of attributes. If a position has special discourse-pragmatic functions, e.g. signalling contrastive focus, then certain things follow from this. First, there is normally only one contrastive focus in a clause, and therefore there should only be one of these positions in a clause in a given utterance. Furthermore, the beginning or end of the clause is a particularly salient position for elements with a special discourse-pragmatic status, and so it is natural that these special positions would be found in these locations in the clause. Moreover, since both arguments and adjuncts can function as e.g. contrastive foci, both should be able to appear in

¹⁶ The tense prefix would be attached to the structure via the operator projection, which is not represented here.

these positions. With respect to complex sentences, most embedded clauses are presupposed, and consequently, it should be difficult for these discourse-pragmatically specialized positions to occur in embedded clauses (see fn. 13). Finally, since every language can express discourse-pragmatic functions like (contrastive) topic or focus, it is in principle possible for any language, be it dependent-marking or head-marking, to have a PrCS or PoCS (or both), as appropriate. Thus, the properties of the PrCS/PoCS seem to stem directly from its specialized role in the information structure of utterances.

Do the collective properties of ECSs follow from their lack of discourse-pragmatic specialization? It appears that all but one do indeed follow from this. If the elements in the ECS have no special discourse-pragmatic function, then there is no reason for the number of them to be restricted for information-structural reasons. There can be as many as there are arguments of the predicate in the nucleus. If they have no special discourse-pragmatic function, then there is no reason for them to be restricted to particular locations within the clause. For the same reason, there is no reason for them to host adjuncts as well as arguments, because there are already pragmatically unspecialized locations for adjuncts in the LSC in all types of languages, namely the peripheries. With respect to complex sentences, the lack of discourse-pragmatic specialization means that RPs in ECSs are equally at home in presupposed embedded clauses as in asserted main clauses. However, the last property, the restriction to head-marking languages, does not seem to follow in any way from this lack of discourse-pragmatic specialization. Accordingly, the important typological and theoretical question is, why are ECSs restricted to head-marking languages only?

One part of the answer is straightforward: because the core argument positions in a head-marking language are occupied by bound forms, the only clause-internal position available for an independent RP to occur in would be an extra-core position. Hence ECSs are required in head-marking languages. But why do they not occur in dependent-marking languages? In other words, why do dependent-marking languages not have RPs in ECSs together with independent pronouns in core argument positions? Why is there only the PrCS or PoCS? In all languages there is a constraint on the instantiation of referents functioning as arguments of the predicate in the nucleus to the effect that each referent with a specific argument function may be instantiated no more than once per core.¹⁷ The crucial difference between head-marking and dependent-marking languages is that this restriction has been extended to the *clause as a whole* in dependent-marking languages: each referent functioning as an argument may be instantiated no more than once per clause, either in the core or in the PrCS/PoCS, but not both.¹⁸ The effect of this restriction can be seen in the lack of resumptive pronouns for

¹⁷ Appositives like *John, my best friend, is very sick* are not exceptions, because appositives are in effect a reduced non-restrictive relative clause and thus are RP-internal constituents (see Van Valin 2005:222-3); there is only one RP instantiating the referent *John* in the matrix core of the clause.

¹⁸ This explains the usual complementarity between clitic pronouns and independent RPs in dependent-marking languages. In some languages, however, clitic doubling occurs, i.e. the co-occurrence of a clitic pronoun and an independent RP as in some varieties of Spanish, and this represents a transition towards a head-marking-type system. Belloro (2004a,b, 2007) presents an RRG analysis of clitic doubling in Spanish, which attempts to capture the typologically transitional nature of the phenomenon; Kailuweit (2008) presents a head-marking analysis of Spanish clitic-doubling structures. In Nichols & Bickel (2005) this phenomenon is referred to as ‘headward-migrated dependent marking.’

It should also be noted that multi-core clauses like *John_i asked Mary to help him_i* are not counterexamples to this principle, for the following reason. The referent ‘John’ is instantiated twice, once by *John* and once by *him*, but these represent two different arguments, i.e. *John* is the actor of *ask*, while *him* is the undergoer of *help*. The constraint applies to the instantiation of a referent serving as one particular argument.

arguments in the PrCS/PoCS in dependent-marking languages. A resumptive pronoun for an argument in the LDP/RDP, on the other hand, does not violate this principle, because the LDP/RDP is outside of the clause and only the resumptive pronoun is clause-internal. This constraint interacts with the fundamental RRG principle that the semantic arguments of the predicate in the nucleus must occur in the core by default, in the following way: in the absence of any compelling discourse-pragmatic motivation, a semantic argument must occur in the core as a core argument,¹⁹ and given the constraint that only one instantiation of the referent functioning as an argument is allowed per clause, this eliminates the motivation for ECS structures like those in Figures 2 and 3 in dependent-marking languages.

It was mentioned in §3 that in Distributed Morphology “open class words are composed of at least two component morphemes, an encyclopedic component and a purely formal component” (Pensalfini 2004:360-1). In other words, each referent is instantiated by a morpheme expressing person, number, and other such ‘formal’ features, on the one hand, and by a morpheme expressing its substantive lexical content, according to this view. This is claimed to be true universally, but this cannot be the case. It is correct for head-marking languages, in which the ‘formal’ component is realized by the bound core argument and the lexical (‘encyclopedic’) component by the independent RP in an ECS, but it is not correct for dependent-marking languages, for it would violate the ‘one instantiation of a referent per clause’ principle.

Another question which arises is, how is the number of RPs in a clause constrained? What is to prevent too many RPs from occurring with a given verb? The relevant constraints are found in the RRG linking algorithm, in both semantics-to-syntax linking and also in syntax-to-semantics linking. A fundamental constraint governing the linking is the Completeness Constraint (Van Valin 2005: 129-30), which states, in essence, that all referring expressions in the syntax must be linked to an argument position in the semantic representation, and that all lexically filled argument positions in the semantic representation must be realized in the syntax.

The RRG account of linking in head-marking languages will focus on the Lakota sentence in (14).

- (14) Mathó ki wo- wíčha- wa- t’í- kte.
 bear the do.by.shooting-3plANIMU-1sgA-die FUT.IRR
 ‘I will shoot the bears to death.’

The verb is *wot’á*, which is composed of the instrumental prefix *wo-* ‘do by action from a distance’ and the verb *t’á* ‘die’, yielding ‘cause to die by action from a distance’, i.e. ‘shoot to death’ or ‘kill by shooting’; the form *wot’í-* is due to a morphophonemic change triggered by the future/irrealis clitic *-kte*.²⁰ The steps in the semantics-to-syntax linking are: (1) construct a semantic representation, based on the logical structure of the predicate, (2) assign actor and undergoer, (3) select an argument to be the privileged syntactic argument and assign case, (4) select the appropriate syntactic templates, and (5) link the elements into the appropriate posi-

¹⁹ This default can also be constructionally overridden, as for example in a passive construction when the actor argument occurs in the periphery as an adjunct, rather than as a core argument.

²⁰ Rood & Taylor (1996) analyze *kte* as a clitic rather than as a suffix.

tions in the clausal syntactic template.²¹ One immediate complication that sentences like (14) pose is that there are three referring expressions in the clause, i.e. *mathó ki* ‘the bear’, *wičha-* ‘them [animate]’, and *wa-* ‘I’, but the verb is transitive and has only two arguments, i.e. [do.by.action.from.distance’ (x, Ø)] CAUSE [BECOME **dead**’ (y)]. However, *mathó ki* ‘the bear’ and *wičha-* ‘them’ are not referentially distinct; that is, they denote the same participant in the event; hence they both instantiate the *y* argument and must, therefore, both fill the *y* argument slot in the logical structure. Thus, the logical structure for (14) would be [do.by.action.from.distance’ (1sg, Ø)] CAUSE [BECOME **dead**’ (3plANIM [mathó])]. The obligatory instantiation of the participant is the prefix *wičha-*; the optional RP *mathó ki* is in brackets to signal its secondary status.²² The affix will be linked to a slot in the core of the clause, while the RP will be linked to a position in the clause but outside of the core. This satisfies the Completeness Constraint. This is illustrated in Figure 4.

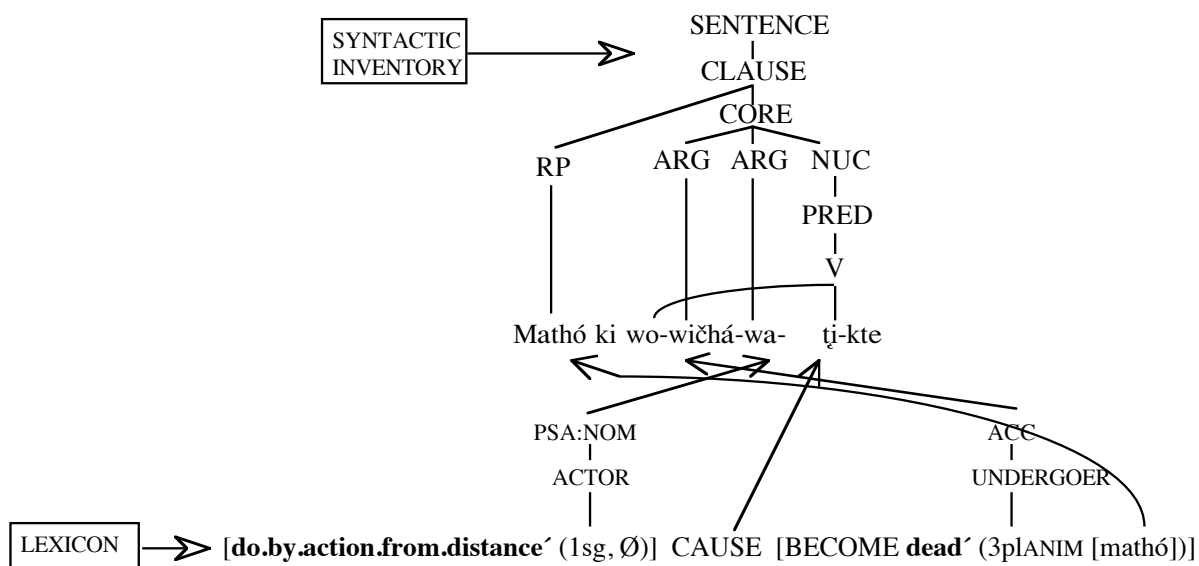


Figure 4: Linking from semantics to syntax in (14)

Given that the semantic representation is based on the logical structure of the verb, there is no possibility of an unaffiliated RP being generated.

²¹ See Van Valin (2005:136-49) for detailed discussion and exemplification.

²² This double filling of an argument position is not unique to head-marking languages. In an English sentence like *It surprised everyone that Mary was the culprit*, both *it* and *that Mary was the culprit* fill the first argument position of *surprise*. See Van Valin & LaPolla (1997: 528). This sentence does not violate the principle of one instantiation of a referent per clause, because there is no referent involved: the *it* cataphorically refers to the extraposed clause, which expresses a proposition and does not instantiate a referent. The structure of sentences involving extraposed clauses does in fact mirror that of head-marking languages: *it* is in a core argument position, while the extraposed clause is outside of the core but inside the clause (see Van Valin 2005:199). Thus such structures are possible in dependent-marking languages, if there is no double instantiation of a referent within the clause, and this means that this structure is restricted to propositional arguments only. This structure is motivated by a number of considerations, including the principle of symmetry in clause linkage (Van Valin 2005:198-200), a principle which applies equally in both types of languages.

RRG also provides for a linking from the syntax to the semantics.²³ The steps are: (1) the parser outputs a syntactic representation; (2) semantic information is gleaned from the morphosyntactic form, i.e. from word order, case, voice, etc.; (3) the logical structure of the predicate is accessed in the lexicon, and as much information is deduced from it as possible; and (4), the information from steps (2) and (3) are matched up.²⁴ A crucial part of step 2 in head-marking languages is that independent RPs must be associated with a bound marker on the verb, in order to be interpreted. In the case of (14), there is one RP, *mathó ki* ‘the bear’, which is third person, animate and unmarked for number, and there are two bound argument markers on the verb, one first-person singular (*wa-*) and the other third-person plural animate (*wičha-*). The RP is compatible with only one of the bound markers, *wičha-*, and consequently it is associated with it.²⁵ It is accusative, and therefore the argument *mathó ki/wičha-* is the undergoer. The other argument marker is in the nominative case, and therefore it is the actor. Based on the logical structure of the verb, [do.by.action.from.distance’ (x, Ø)] CAUSE [BECOME dead’ (y)], it can immediately be determined that the *x* argument is the actor and the *y* argument the undergoer. In the final step, the undergoer *mathó ki/wičha-* is linked to the *y* argument, and the actor *wa-* is linked to the *x* argument in the logical structure, thereby satisfying the Completeness Constraint. This is summarized in Figure 5.

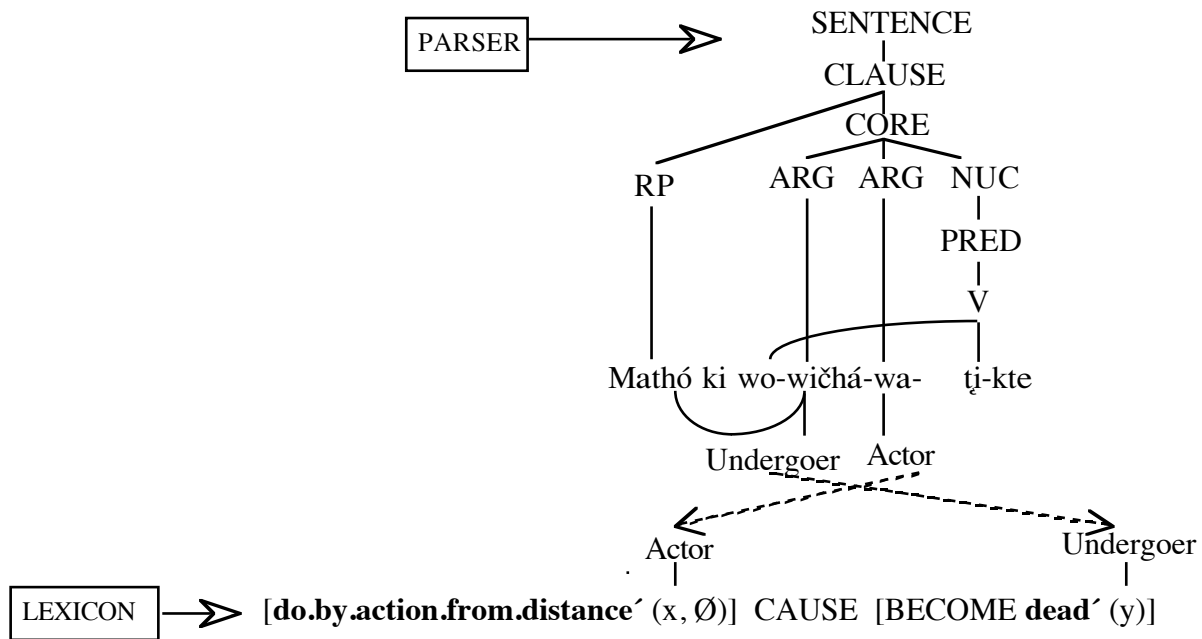


Figure 5: Linking from syntax to semantics in (14)

²³ In this regard RRG is somewhat unusual, as it links bidirectionally. This is a reflection of what speakers and hearers do: in language production the speaker maps a semantic representation into a syntactic representation, which will then be uttered, while in language comprehension the hearer maps from the syntactic representation to the semantic representation, in order to interpret the sentence. See Van Valin (2006) for discussion of RRG in relation to language processing models.

²⁴ See Van Valin (2005:149-58) for detailed discussion.

²⁵ If the independent RP is compatible with both of the markers on the verb, e.g. *Mathó ki na-Ø-Ø-xʔi* [bear the stem-3sgA-3sgU-hear], then the sentence is ambiguous, i.e. this can mean either ‘The bear heard him/her/it’ or ‘He/she heard the bear’.

If there had been two RPs, as in **Mathó ki šųymánu ki wowíčhawat'ikte* [bear the coyote the them-I-kill.by.shooting-FUT] 'I will shoot the bear(s) the coyote(s) to death', one of the RPs cannot be associated with an argument marker on the verb and therefore cannot be linked to the semantic representation, resulting in a Completeness Constraint violation. Thus, the Completeness Constraint guarantees that there can be no more independent RPs in a clause than compatible feature bundles for the arguments of the verb.

5. The layered structure of the clause and the layered structure of the word

The analysis of head-marking languages presented here raises an important issue regarding the morphology-syntax interface. Since Chomsky (1970) many linguists have assumed something like the principle of lexical integrity in (15), e.g. Lapointe (1981), DiSciullo & Williams (1987), Bresnan & Mchombo (1995).

(15) Syntactic rules are not allowed to refer to the internal morphological structure of words.

The analysis of Lakhota control constructions presented in §2 appears to be incompatible with this, as it asserts that it is precisely the argument features on the verb that the syntax targets in the control construction and others. However, it has been noted that (15) is too strong, e.g. Anderson (1982), Haspelmath (2002), and that the inflectional properties of words can be accessible to the syntax. Relevant to this discussion is finite verb agreement in languages like German and English; they are instances of inflectional morphology relevant to the syntax but they do not play a role in the syntax the way the bound argument markers in Lakhota and other head-marking languages do. Moreover, it is widely agreed that the derivational properties of words are not accessible to the syntax. So the question is, what kind of morphological theory is compatible with the RRG analysis of head-marking languages and at the same time represents inflectional and derivational morphology in such a way that inflectional features can be targeted by the syntax and derivational features cannot be?

There is as yet no full-blown RRG theory of morphology, but Everett (2002) laid out a sketch of what a possible RRG theory would look like. He characterizes it as an 'inferential-realizational' theory, along the lines of Stump (2001).²⁶ It follows the RRG concept of layering, positing a layered structure of the word analogous to the layered structure of the clause and of other phrases. The stem is the nucleus_w, which may be internally complex, and inflectional affixes are formatives which are daughters of the core_w; clitics are formatives which attach to words in detached positions analogous to those in the sentence.²⁷ The basic structure of the layered structure of the word and an example from English, *refusals*, is given in Figure 6.

²⁶ For further developments of these ideas, see Martin Arista (2008), Nolan (2009) and Boutin (2009), and for work on derivational morphology in RRG, see Cortés-Rodríguez and Pérez Quintero (2002), Cortés-Rodríguez (2006).

²⁷ Everett (1996) argues that clitics are distinguished from affixes primarily in their manner of attachment.

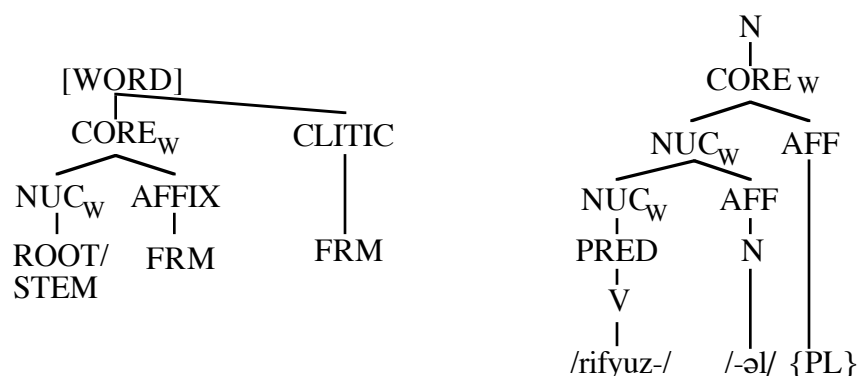


Figure 6: The layered structure of the word (template), the layered structure of *refusals*

The internal structure of the nucleus_W is opaque to the syntax; as far as the syntax is concerned, *refusals* is no different from *dogs* or *houses*. The number feature is instantiated by the plural suffix in the core_W and is, however, accessible to the syntax for e.g. agreement purposes. Hence derivation is captured within the nucleus_W, while inflection is represented within the core_W. These structures can be considered to be morphological templates for words, analogous to the syntactic templates for clausal structures posited in RRG.²⁸ Just as syntactic templates for clausal structures are selected based on the logical structure of the clause, so would morphological templates be selected based on the semantic representation of the word.

In many of the glosses there has been a 'Ø' indicating certain third-person arguments (cf. fn. 4), and they may now be understood as representing person, number and animacy specifications of arguments for which there is no morphological exponent, namely {3sg} and, with transitive verbs, {3plINANU}. The function of the third-person singular argument is irrelevant; regardless of whether it is actor, undergoer or a non-macrorole argument, its morphological exponent is the same, namely, nothing. Hence the morphological structure of *wičhák'uw* 'I gave it to them' in (2b) would be as in Figure 7 (cf. Figure 1).

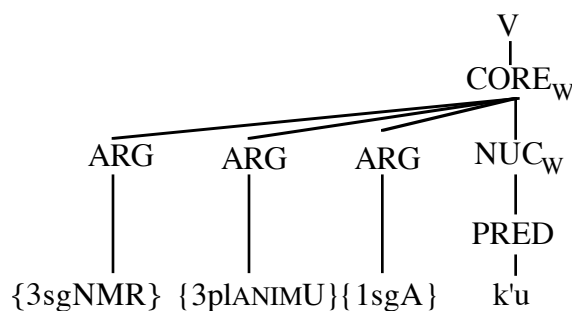


Figure 7: The layered structure of the word *wīchák'uw* 'I gave it to them' in (2b)²⁹

Since the nucleus is a verb, the formatives which are daughters of core_W will be labeled as 'arguments'; their status as affixes follows from the structural definition given earlier.

²⁸ Two differences between the layered structure of the word and that of clauses and RPs concern the lack of peripheries and an operator projection in the layered structure of the word. This is due to the lack of word-internal modifiers modifying the layers of the word.

²⁹ Lakota shows secondary-object alignment, and therefore the recipient rather than the theme is the undergoer.

All of the cases examined thus far have been ones in which the exponent of the morpho-syntactic feature bundle could equally well have been expressed by a simple traditional morpheme in a lexical, non-realizational framework. However, Lakota has its share of problematic cases, and two of them are particularly relevant for this discussion. The first concerns stative verbs with inanimate subjects. The only instance in which the number of an inanimate argument is explicitly coded is with the plural subject of a stative verb, as illustrated in (16b').

- (16) a. Wičháša ki háske.
 man the tall
 'The man is tall.'
 a'. Wičháša ki hená háska-pi.
 man the those tall-PL
 'Those men are tall.'
 b. Čhă ki háske.
 tree the tall
 'The tree is tall.'
 b'. Čhă ki hená háskaska.
 tree the those tall.PL
 'Those trees are tall.'

The exponent of {3plANIMU} is the suffix *-pi*, while the exponent of {3plINANU} is reduplication of the stative verb. In both (16a') and (b') the morphological structure involves two elements, *háska* plus either {3plANIMU} or {3plINANU}, but the realization of these combinations is quite different. A second example involves suppletion in the argument-marking paradigm. When the actor is first person singular and the undergoer second person, the expected affix combination **ni-wa* does not occur; rather, these two forms are replaced by a portmanteau form, *-čhi-*.³⁰ If the verb in Figure 7 is changed to 'I gave it to you', then the form would not be the expected **Ø-ni-wá-k'u* [3INAN-2sgU-1sgA-give] but rather *Ø-čhi-č'ú* [3INAN-1sgA+2sgU-give].³¹ There would be a special realization rule for the combination which would take precedence over the more general rules governing the instantiation of {1sgA} and {2U}, following Pāṇini's principle, namely, that more specific rules take precedence over more general rules (Stump 2001).

The morphological structure of the word *wowíčháwat'ikte* 'I will shoot them to death' from (14) is given in Figure 8. It contains a complex nucleus_w composed of two nuclei_w *wo-* 'do by action from a distance' and *t'a* 'die',³² along with two bundles of morphosyntactic fea-

³⁰ In some head-marking languages, e.g. Oneida (Koenig & Michelson 2009), all marking on transitive verbs involves non-decomposable forms which signal actor and undergoer simultaneously; there are no distinct actor or undergoer affixes on Oneida transitive verbs. See Koenig & Michelson (2009) for an HPSG-based account of the differences between head-marking and dependent-marking languages which treats independent RPs as semantic but not syntactic arguments of the verb.

³¹ /k/ → /č/ after /i/ is a regular morphophonemic alternation for non-stative verbs.

³² The internal structure of complex nuclei_w would be characterizable in terms of the nexus types that characterize complex sentences. *Refusals* in Figure 6 is an example of nuclear_w subordination, since the verb root *refuse* is nominalized by the suffix *-al*, while in Figure 7 the relation between the nuclei_w is nuclear_w cosubordination, since the roots co-predicate.

tures, {3plANIMU} and {1sgA}, which will be instantiated by two core_w -level affixes, *wičha-* and *wa-*, respectively, along with a clitic, *kte* instantiating the feature ‘future-irrealis’.

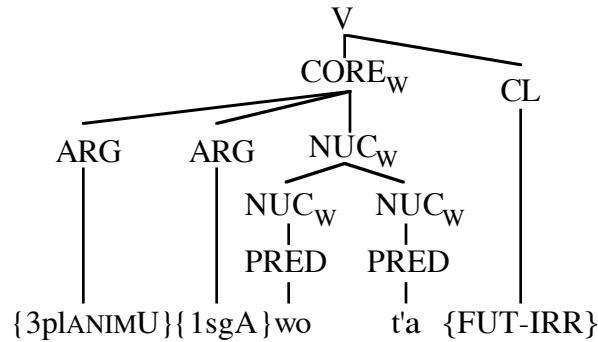


Figure 8: The layered structure of the word *wowičhawat'ikte* ‘I will shoot them to death’

In the representation in Figure 8, the feature bundles for the core arguments are not represented as infixes. As mentioned earlier (fn. 7), some verbs take the core argument markers as infixes, others as prefixes, and this is an idiosyncratic property of particular verbs; for example, roughly half of the instrumental prefixes take them as prefixes in derived verbs, the other half as infixes. In morphological representations like the one in Figure 8, they will be represented as prefixes, with the actual instantiation determined by the morphophonological rules associated with the morphological rules. There is no difference in the syntactic status of prefixed vs. infixed argument markers.

The core_w structure in Figure 8 bears a striking resemblance to the structure of the core in the clauses in Figures 4 and 5, and this is no accident, since the inflectional affixes in the core_w also instantiate the core arguments in the core of the clause. Thus, it appears to be the case that in Lakota, and in head-marking languages in general, the core of the verb and the core of the clause are coextensive; that is, the nucleus_w of *wowičhawat'ikte*, *wot'a-*, is also the nucleus of the clause, and the argument-signaling affixes in the core_w are the core arguments. Hence, crucially, the structure of the core_w provides the structure of the core of the clause. The structure of (14), with both constituent and operator projections for the clause, is given in Figure 9.

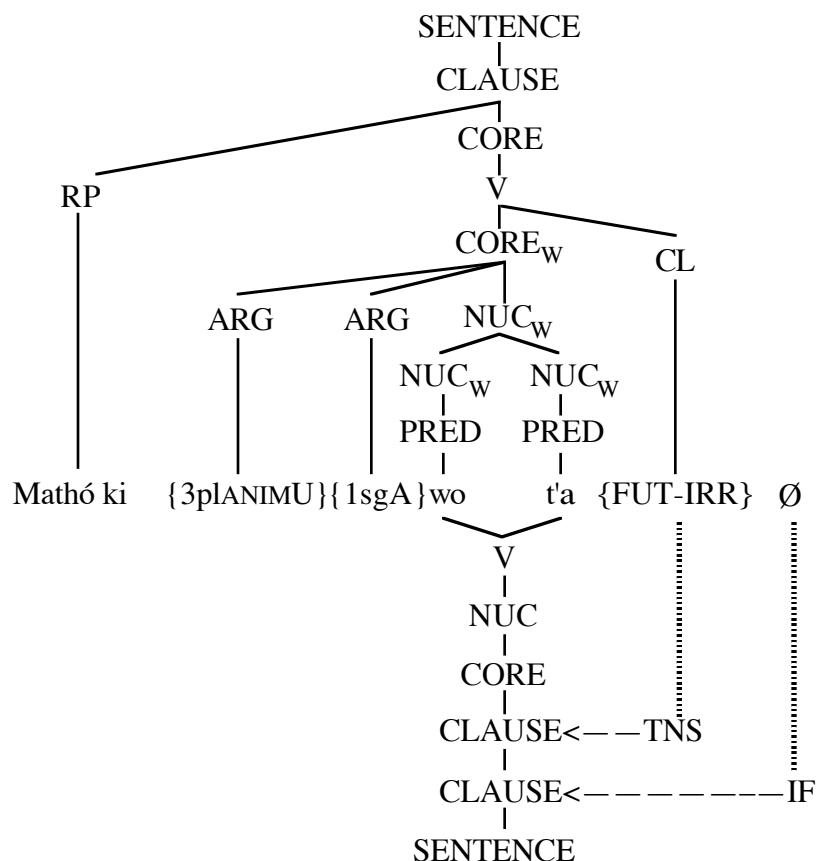


Figure 9: The structure of (14)

The significant feature of this representation is that the bound argument markers *wičha-* ‘3pl animate U’ and *wa-* ‘1sgA’ are simultaneously constituents of the $core_w$ of the verb and of the core of the clause; they satisfy the valence requirements of the predicate *wot’a* at both levels. Because the valence requirements of the verb are satisfied at the morphological level, there are no open core slots for independent RPs to fill, and accordingly they must occur outside the core. It is this structural isomorphism between core and $core_w$ that appears to be the defining property of head-marked structures, and from it follow the features discussed above. Because the core of the clause is a word, the core arguments can only be represented by affixes, which express only person, number, gender (animacy), or case, depending on the language. For a full lexical specification of the argument, a full RP is needed, and it must occur outside the core in an ECS (default) or in another extra-core position. The addition of morphological structure to the representations means that the Lakota and Tzutujil trees in Figures 1 through 5 are no longer correct, strictly speaking; in them the argument-marking affixes are given as daughters of the clausal core node, when they are in fact daughters of the $core_w$ of the verb.

Portmanteau forms like *-čhi-* can be handled in terms of two semantic arguments mapping into one morphophonological form. This is illustrated in the linking between semantics and syntax for *čhič’ú* ‘I gave it to you’, as in Figure 10, which has the same structure as the form in Figure 7. Crucially, the actor and undergoer arguments in the logical structure are realized by a single affix, *-čhi-*; the combination of first singular actor with a second person undergoer would trigger the selection of a special morphological template. Despite there being only two

overt affixes in the core_w, the Completeness Constraint is satisfied, because all of the specified arguments in the logical structure are realized in the morphosyntax.

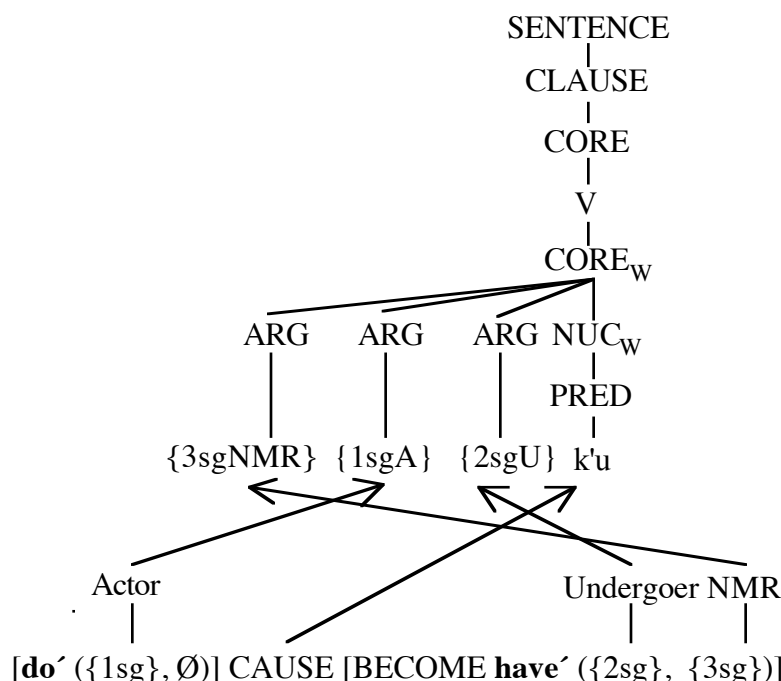


Figure 10: Linking from semantics to syntax for Čhič'ú 'I gave it to you'

Morphophonological rules will realize {3sgNMR} as zero and {1sgA}+{2sgU} as *-čhi-*. In the syntax-to-semantics linking, *-čhi-* will be interpreted as '1sgA+ 2sgU' and will therefore be linked to the actor and undergoer argument positions in the logical structure of the verb.

In German, a strongly dependent-marking language, a finite verb like *läuft* 'runs' would have a similar structure to verbs in Lakhota, in that there is a nucleus_w, *lauf-*, and a core_w-level affix, *-t*, which realizes third-person singular subject and present tense features. Given the similar word structure in Lakhota and German, why is it that the morphosyntactic features expressed by person-marking affixes in Lakhota play a direct role in the syntax while the corresponding features in German do not? The answer is that in German, English, and other non-head-marking languages, the core_w of the verb is completely independent of the core of the clause and is a constituent of the nucleus of the clause. The affix signals the person and number features of the subject in German for agreement purposes, but it does not map onto an argument position in the core. The structure of (14) in Figure 9 contrasts sharply with the structure of the German sentence *Der Mann läuft* 'the man runs', given in Figure 11.

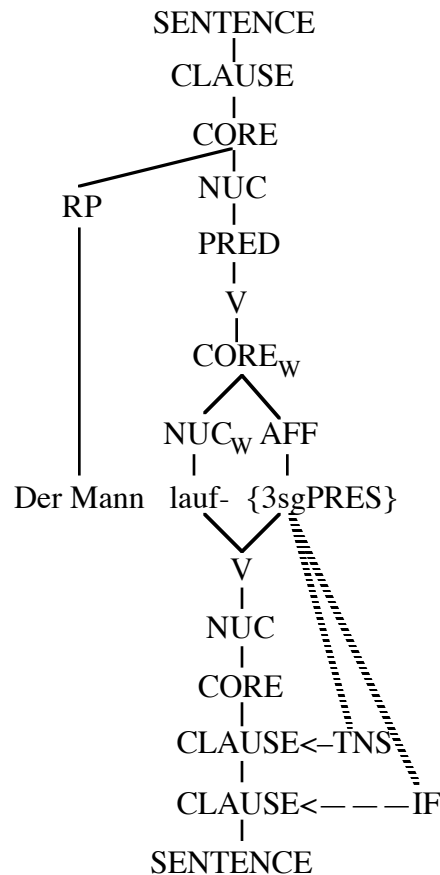


Figure 11: The structure of *Der Mann läuft* ‘the man runs’

In this structure the core_w-level affix indicating third-person singular subject (-t) is part of the clausal nucleus and does not have any structural connection to the core of the clause; the single core argument is the RP *der Mann* ‘the man’.

It was mentioned in fn. 5 that there are double-marking languages, which have both bound argument markers as well as case on independent RPs. Double-marking languages cover a wide typological range, from basically head-marking languages with case marking, e.g. Kabardian (Matasović 2008, 2009), to basically dependent-marking languages with ‘subject’ agreement which allows the ‘subject’ to be dropped, e.g. Croatian. For the first type of language, the analysis of head-marking presented here would apply; i.e. the bound argument markers are the core arguments, and the case-marked RPs occur in ECSs. The second type of language raises an important question about the status of the agreement marking on the finite verb or auxiliary, since it can function as the instantiation of the argument under certain circumstances. Examples from Croatian illustrating the issue are given in (17).

- (17) a. Marij-a je kupi-l-a knjig-u.
 Maria-FsgNOM be.3sg buy-PAST-Fsg book-FsgACC
 ‘Maria bought the book.’
 b. Kupi-l-a je knjig-u.
 buy-PAST-Fsg be.3sg book-FsgACC
 ‘She bought the book.’

In (17a) there is an overt RP ‘subject’, *Marija*, and there is agreement in person and number on the finite auxiliary and in gender on the main verb, whereas in (16b) the ‘subject’ argument is expressed solely by the agreement morphology on the verbal complex. It is implausible to claim that the verb complex in (17a) has a structure analogous to that in Figure 11 and that the verb complex in (17b) suddenly shifts to a structure like that in Figure 9 when the ‘subject’ RP is omitted. Rather, the simplest and most plausible analysis is that in both examples the structure is that in Figure 11. This accounts for (17a) directly, but raises the question of how the agreement morphology in that structure can instantiate a core argument. Does the agreement violate the constraint against double instantiation of a referent within the clause? It does not, because it is not directly a constituent of the core of the clause, unlike the bound argument markers in Figure 9. However, it expresses the person, number, and gender features of the argument, and these features are accessible to the syntax, minimally for agreement purposes. Only in the absence of an independent RP (nominal or pronominal) can the agreement morphology count as the instantiation of the argument; this idea was originally put forward in Bresnan & Mchombo (1987). This reflects two fundamental properties of dependent-marking languages. First, instantiation of arguments via independent pronouns and nominal expressions has priority over morphological expression of arguments, which is exactly the opposite of the situation in head-marking languages. Second, the structure of the core_w of the verb does not reflect, and is independent of, the structure of the core of the clause. Thus, morphological expression of the person, number and gender features of the highest ranking macrorole argument functions as agreement when there is an RP instantiating it, but in the absence of an RP the agreement morphology may serve to instantiate it.³³

Thus, the RRG approach to word structure, the layered structure of the word, makes it possible for person-marking affixes to play a direct role in the syntax in head-marking languages, due to the structural parallels between the layered structures of the clause and of the word. Moreover, it ‘hides’ derivational morphology from the syntax inside the nucleus_w and allows the morphosyntactic features expressed by inflectional affixes in the core_w to be accessible to the syntax. Even though the approach is in only the initial stages of development, it has shown itself capable of accounting for the difference between head- and dependent-marking structures, and this suggests that it will be a productive means of investigating the syntax-morphology interface.

6. Conclusion

Head-marking languages provide a profound challenge to theories of language structure, due in part to the origin of the widely assumed descriptive categories and theoretical concepts in the analysis of dependent-marking languages, as Nichols (1986) argued. They raise significant questions for not only syntactic theory but also for morphological theory as well. This paper has presented the Role and Reference Grammar approach to the analysis of head-marked clause structure, showing how the differences and similarities between it and dependent-marked clause structure can be captured in a principled way. In addition, the nascent RRG approach to word structure, the layered structure of the word, provides an account of the morphology-syntax interface which captures the similarities and differences between

³³ An obvious question is why German and other non-‘pro-drop’ languages with such agreement do not allow the agreement morphology on the verb to instantiate the argument; an answer to this is beyond the scope of this paper.

the two types of language. The account presented here is a solution to the important descriptive and theoretical problems raised by head-marking languages which were pointed out by Nichols in her seminal 1986 paper.

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