Semantic Macroroles in Role and Reference Grammar

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1. Introduction

Issues regarding the nature of the semantic relationships holding between a verb (or other predicating element) and its arguments have been the focus of much research and controversy since the mid-1960's. Starting from Gruber (1965)'s notion of thematic relations and Fillmore (1968)'s concept of case roles, most contemporary theories of grammar assume some system of semantic predicate-argument relations. Most theories assume a set of thematic relations such as agent, patient, theme, instrument, etc. which map into a set of grammatical relations (e.g. Lexical-Functional Grammar) or structural positions in clauses (Government & Binding Theory). Role and Reference Grammar [RRG] (Van Valin 1993, in press; Van Valin & LaPolla 1997) has taken a somewhat different approach to this aspect of the syntax-semantics interface. In some of the earliest work in the theory (Van Valin 1977), it was proposed that there are two types of semantic relationships holding between predicates and their arguments: the familiar thematic relations like agent, experiencer, patient, etc., as well as a second, more general type of semantic role, of which there are only two, termed *actor* and *undergoer*. The latter type of role was labelled *semantic macroroles*. Originally unique to RRG, this notion has been picked up and developed in different ways in a variety of approaches.[1]

The purpose of this paper is to elucidate the RRG concept of semantic macrorole. The discussion will proceed as follows. In the next section, the semantic basis of the distinction between actor and undergoer will be clarified, and in the following section, the function of semantic macroroles in the RRG linking system will be discussed. In the final section, the issue of how many macroroles there should be will be addressed.

2. The semantic basis of macroroles

Pretheoretically, the essential insight motivating the postulation of semantic macrorles is that despite the profusion of thematic relations or related notions that can be argued for, there is nevertheless a fundamental opposition between what have been called the two cardinal arguments of a transitive predication, an agent-like role and a patient-like role, and it is these two arguments that many morphosyntactic phenomena are keyed to. Semantic roles have been discussed at three distinct levels of generality. The first is what may be called 'verb-specific' semantic roles, e.g. runner, killer, hearer, broken, etc. The second are thematic relations, which are generalizations across the verb-specific roles, e.g. agent, instrument, experiencer, theme, patient. The third are semantic macroroles, actor and undergoer, which are generalizations across thematic relations. Actor is a generalization across agent, experiencer, instrument and other roles, while undergoer is a generalization subsuming patient, theme, recipient and other roles. Agent is the prototype for actor, and patient is the prototype for patient. The relationships among the three types of semantic roles are summarized in Figure 1.

[1] See Van Valin (1999) for a survey of other theories of semantic macroroles and a critical comparison of them with the RRG approach.

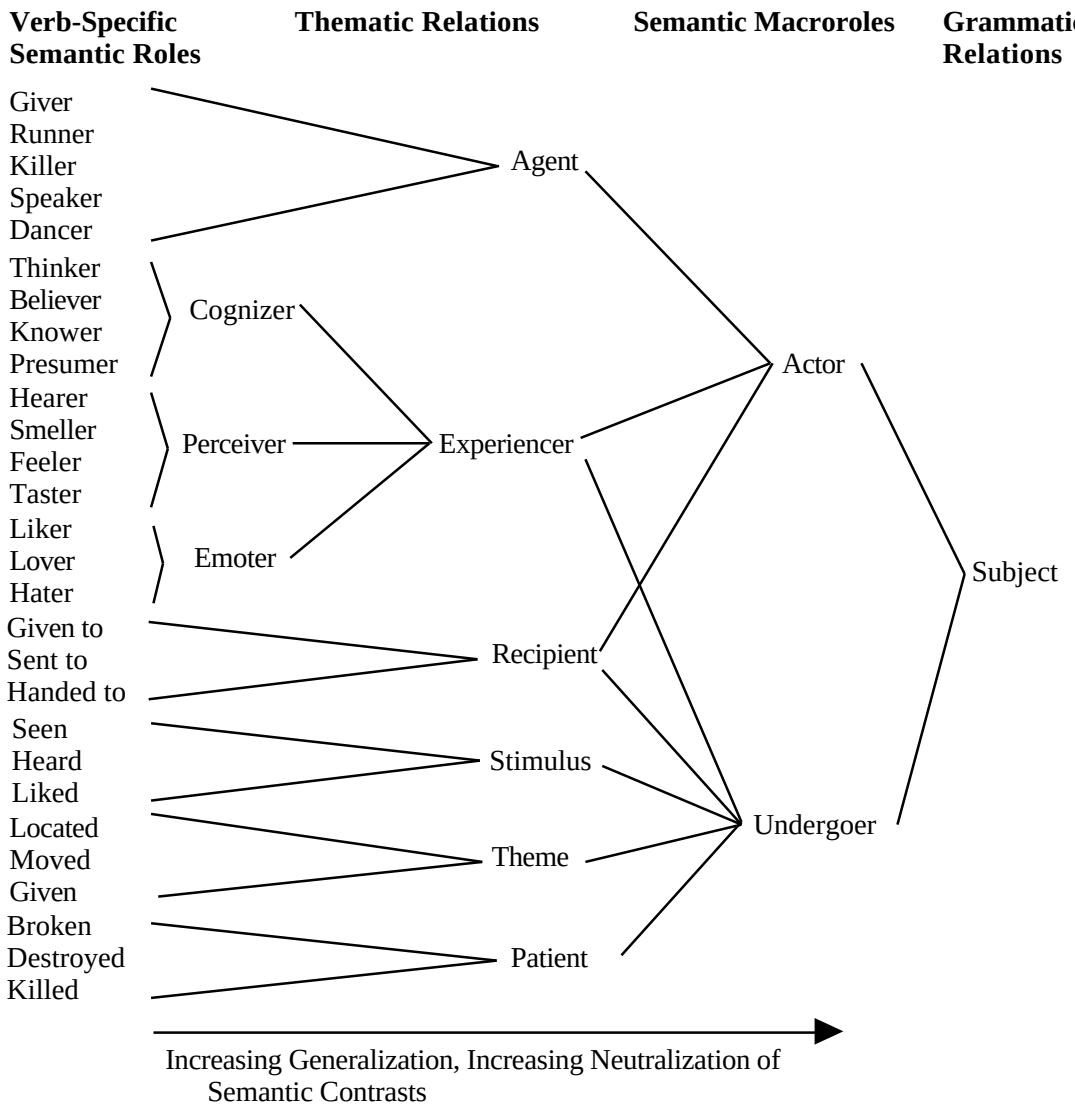

Figure 1: Continuum from verb-specific semantic roles to grammatical relations

What exactly does it mean for actor and undergoer to be 'generalizations across thematic relations'? Consider the range of thematic relations that can function as subject and direct object in English.

(1)	a. The farmer killed the duckling.	Agent	Patient
	b. The rock broke the window.	Instrument	Patient
	c. The lawyer received the summons.	Recipient	Theme
	d. Many tourists saw the accident.	Experiencer	Stimulus
	e. Sally presented Bill with the award.	Agent	Recipient
	f. The mugger robbed Sam of $50.	Agent	Source
	g. The clown amused the child.	Agent	Experiencer

(2) a. The duckling was killed by the farmer.
b. The window was broken by the rock
c. The summons was received by the lawyer.

d. The accident was seen by many tourists.
e. Bill was presented with the award by Sally.
f. Sam was robbed of $50 by the mugger.
g. The child was amused by the clown.

To the right of each example in (1) is listed the thematic relation of the subject followed by the thematic relation of the direct object. There is a range, sometimes overlapping, of thematic relations that can serve as subject and direct object; the subject can be an agent, instrument, experiencer or recipient, while the direct object can be a patient, theme, stimulus, recipient, source or experiencer. The passive versions of these sentences are given in (2), and the very same grouping of thematic relations that functions as the direct object in (1) serves as the subject in (2), and similarly, the same grouping of thematic relations that functions as the subject in (1) appears as the object of *by* in the passive versions. The grammatical relations are different in (1) and (2), and yet the groupings of thematic relations are the same. This shows that these groupings do not constitute a grammatical relation but rather another, more general type of semantic role. The role of the subject of an active voice transitive verb and the object of *by* in a passive construction is actor, and the role of the direct object of an active voice transitive verb and the subject of a passive verb is undergoer. In terms of (1), the thematic relations in the left column function as the actor with each of those verbs, and the relations in the right column function as the undegoer with each of them. Actor and undergoer are thus generalizations across the thematic relations in each column. The single argument of an intransitive verb is either an actor, as with verbs like *run*, or an undergoer, as with verbs like *die*.

This brings out one of the important generalizations that the notions of actor and undergoer capture. It is very simple to describe active and passive voice in an accusative language like English using macroroles: in the active voice, the actor is subject and the undergoer is direct object, whereas in the passive voice, the undergoer is the subject and the actor is an oblique adjunct. If this were stated using thematic relations, the result is less than elegant: in the active voice, the agent, instrument, experiencer or recipient is subject and the patient, theme, experiencer, stimulus, recipient or source is direct object, whereas in the passive voice, the patient, theme, experiencer, stimulus, recipient or source is the subject and the agent, instrument, experiencer or recipient is an oblique adjunct. Clearly, a generalization is being missed in these statements, one that is readily captured in terms of macroroles.

How is this 'generalization across thematic relations' expressed theoretically in RRG?[2] In order to answer this question, we have to start with the RRG lexical representations for verbs and other predicating elements. The lexical representations in RRG involve lexical decomposition, and the decomposition is based on the *Aktionsart* distinctions proposed in Vendler (1957); the formalization is based on Dowty (1979) but differs in certain crucial details. The verb classes with their decompositions are summarized in Table 1.

[2]For detailed presentation of all of the relevant aspects of RRG, see Van Valin & LaPolla (1997), Van Valin (in press).

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), or INGR **do´** (x, [**predicate´** (x) or (x, y)])
ACCOMPLISHMENT	BECOME **predicate´** (x) or (x, y), or BECOME **do´** (x, [**predicate´** (x) or (x, y)])
ACTIVE ACCOMPLISHMENT	**do´** (x, [**predicate$_1$´** (x, (y))]) & BECOME **predicate$_2$´** (z, x) or (y)
CAUSATIVE	α CAUSE β, where α, β are LSs of any type

Table 1: Lexical representations for *Aktionsart* classes[3]

Examples of each class with the logical structure of the verb are given in (3).

(3) a. STATES

Leon is a fool.	**be´** (Leon, [**fool´**])
The window is shattered.	**shattered´** (window)
Fred is at the house.	**be-at´** (house, Fred)
John saw the picture.	**see´** (John, picture)

b. ACTIVITIES

The children cried.	**do´** (children, [**cry´** (children)])
The wheel squeaks.	**do´** (wheel, [**squeak´** (wheel)])
Carl ate snails.	**do´** (Carl, [**eat´** (Carl, snails)])

c. ACHIEVEMENTS

The window shattered.	INGR **shattered´** (window)
The balloon popped.	INGR **popped´** (balloon)
John glimpsed the picture.	INGR **see´** (John, picture)

d. ACCOMPLISHMENTS

The snow melted.	BECOME **melted´** (snow)
The sky reddened.	BECOME **red´** (sky)
Mary learned French.	BECOME **know´** (Mary, French)

e. ACTIVE ACCOMPLISHMENTS

Carl ate the snail.	**do´** (Carl, [**eat´** (Carl, snail)]) & BECOME **eaten´** (snail)
Paul ran to the store.	**do´** (Paul, [**run´** (Paul)]) & BECOME **be-at´** (store, Paul)

[3]The following table compares the verb class taxonomy presented here with the one in Dowty (1979), which was assumed in work in RRG prior to Van Valin & LaPolla (1997).

Verb class in RRG	Dowty (1979)
State	State
Activity	Activity
Achievement	Achievement (punctual)
Accomplishment	Achievement (durative)
Active accomplishment	Accomplishment
Causative state	-----
Causative activity	-----
Causative achievement	Accomplishment
Causative accomplishment	Accomplishment
Causative active accomplishment	-----

f. CAUSATIVES

The dog scared the boy.	[**do´** (dog, Ø)] CAUSE [**feel´** (boy, [**afraid´**])]
Max broke the window.	[**do´** (Max, Ø)] CAUSE [BECOME **broken´** (window)]
The cat popped the balloon.	[**do´** (cat, Ø)] CAUSE [INGR **popped´** (balloon)]
Felix bounced the ball.	[**do´** (Felix, Ø)] CAUSE [**do´** (ball, [**bounce´** (ball)])]

Following Jackendoff (1976), thematic relations can be defined in terms of the argument positions in the decomposed logical structures [LS]. Only state and activity predicates have argument positions which define thematic relations; the thematic relations of all other types of verbs are derived compositionally from their constituent state and activity predicates.[4] Table 2 gives the thematic relations defined in terms of a number of subclasses of state and activity predicates.

I. STATE VERBS		
A. Single argument		
1. State or condition	**broken´** (x)	x = PATIENT
2. Existence	**exist´** (x)	x = ENTITY
B. Two argument		
1. Pure location	**be-LOC´** (x, y)	x = LOCATION, y = THEME
2. Perception	**hear´** (x, y)	x = PERCEIVER, y = STIMULUS
3. Cognition	**know´** (x, y)	x = COGNIZER, y = CONTENT
4. Desire	**want´** (x, y)	x = WANTER, y = DESIRE
5. Propositional Attitude	**consider´** (x, y)	x = JUDGER, y = JUDGMENT
6. Possession	**have´** (x, y)	x = POSSESSOR, y = POSSESSED
7. Internal Experience	**feel´** (x, y)	x = EXPERIENCER, y = SENSATION
8. Emotion	**love´** (x, y)	x = EMOTER, y = TARGET
9. Attrib/Identificational	**be´** (x, y)	x = ATTRIBUTANT, y = ATTRIBUTE
II. ACTIVITY VERBS		
A. Single argument		
1. Unspecified action	**do´** (x, Ø)	x = EFFECTOR
2. Motion	**do´** (x, [**walk´** (x)])	x = MOVER
3. Static motion	**do´** (x, [**spin´** (x)])	x = ST-MOVER
4. Light emission	**do´** (x, [**shine´** (x)])	x = L-EMITTER
5. Sound emission	**do´** (x, [**gurgle´** (x)])	x = S-EMITTER
B. One or two arguments		
1. Performance	**do´** (x, [**sing´** (x, (y))]	x = PERFORMER, y = PERFORMANCE
2. Consumption	**do´** (x, [**eat´** (x, (y))])	x = CONSUMER, y = CONSUMED
3. Creation	**do´** (x, [**write´** (x, (y))])	x = CREATOR, y = CREATION
4. Repetitive action	**do´** (x, [**tap´** (x, (y))])	x = EFFECTOR, y = LOCUS
5. Directed perception	**do´** (x, [**see´** (x, (y))])	x = OBSERVER, y = STIMULUS
6. Use	**do´** (x, [**use´** (x, y)])	x = USER, y = IMPLEMENT

Table 2: Definitions of thematic relations in terms of logical structure argument positions

[4]There are syntactic and semantic tests to determine the *Aktionsart* of a verb, and none of them refer, directly or indirectly, to thematic relations (see Van Valin & LaPolla 1997, §3.2). Hence because the thematic relations a verb takes are a function of its logical structure, which is determined by the *Aktionsart* tests, the assignment of thematic relations to verbs in RRG is independently motivated.

Agent is not one of the relations listed in Table 2. For verbs which lexicalize agency, there is an operator DO which indicates that the effector argument is to be interpreted as an agent, e.g. the LS for *murder* is DO (x, [**do´** (x, Ø)] CAUSE [BECOME **dead´** (y)]). For verbs which may take an agent but do not require one, i.e. verbs which can have a non-volitional human actor or an inanimate actor (e.g. *Pat accidentally broke the window, A falling tree branch broke the window*), the agent interpretation is an implicature possible only when the effector is human or animate and there is no information to the contrary in the clause, e.g. an adverb like *accidentally* (see Holisky 1987, Van Valin & Wilkins 1996). There is no DO in the LS of such verbs.

It appears that there is quite a large number of thematic relations, but in fact there are really only five distinctions. This can be seen clearly in Figure 2.

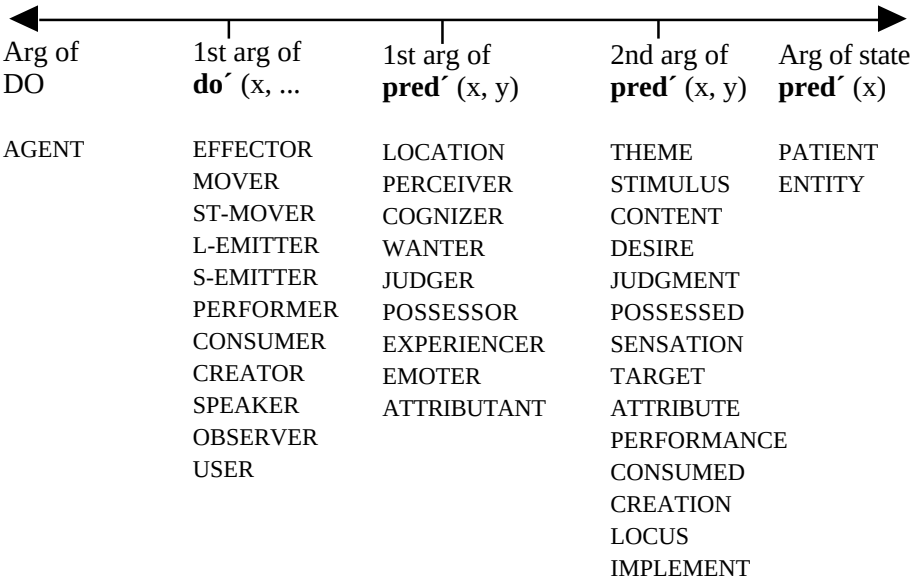

Figure 2: Thematic relations continuum in terms of LS argument positions

With the exception of agent, each of the thematic relations listed under a particular argument position represents a distinct subclass of state or activity verb, and accordingly each is a label for an argument position in the LS of a particular type of verb. For example, perceiver means 'first argument of a two-place state predicate of perception', and stimulus means 'second argument of a two-place state prediccate of perception'. At the current stage of development of the system of lexical decomposition, the thematic relations express the subclass of the verb. That is, there is nothing about the representation **hear´** (x, y) that indicates that *hear* is a perception verb (as opposed to being a cognition or emotion verb, for example), and it is only when the thematic relations are included (i.e. **hear´** (x, y), x = perceiver, y = stimulus) that the fact that *hear* is a perception verb is made explicit. When the system of lexical decomposition is developed to the point that each subclass of state and activity verb has a rich representation which indicates the subclass overtly, thematic relations labels will then be unnecessary, since the interpretation of the argument will follow directly from the representation. Until that point, however, it will be necessary to continue to refer to the thematic relations as a stopgap.

The distinctions in Figure 2 constitute a semantic continuum of argument types, with agent at one end and patient at the other. Agents are willful, controlling, instigating participants in states of affairs, while patients are strongly affected participants. Taking these as endpoints on the continuum allows us to place the other role-types with respect to them. The DO of lexicalized agency always cooccurs with the **do´** (x, ... which defines

effector and its subtypes, and accordingly the first two columns are closely related to each other; all of them express participants which do something. At the other end of the continuum fall patient and theme, etc. If these are compared in terms of the verb-specific semantic roles given in Figure 1, then the single argument of state **predicate´** (x) includes those participants which are crushed, killed, smashed, shattered, broken, destroyed, etc., while the second argument of **predicate´** (x, y) includes those participants which are placed, moved, thrown, given, possessed, transferred, seen, heard, loved, etc. In terms of affectedness, the former type of participant is much more affected than the latter, hence the placement of the single argument of state **predicate´** (x) at the end of the hierarchy. Into the middle of the continuum falls the first argument of **predicate´** (x, y). If it is contrasted with the first argument of **do´**, it is clear that seeing, thinking, believing, possessing, etc. are less agent-like than are speaking, doing, moving, performing, consuming, hence their placement to the right of effector, etc. If, on the other hand, the contrast is with the second argument of **predicate´** (x, y), then the reverse conclusion follows. Seeing, thinking, liking, believing, etc. involve some kind of internal activity (mental, emotional or perceptual) on the part of the participant, whereas being seen, being thought about, being liked or being believed does not require any action or effort of any kind on the part of the participant. Hence the participant denoted by the first argument is more active and hence more agent-like than the participant referred to by the second argument, and accordingly, the first argument is closer to the agent end of the hierarchy than the second argument. Thus, the positioning of the different argument positions in the continuum in Figure 2 reflects the semantic contrasts among them.

The relationship between macroroles and the arguments of particular verbs is captured by the Actor-Undergoer Hierarchy [AUH] in Figure 3.

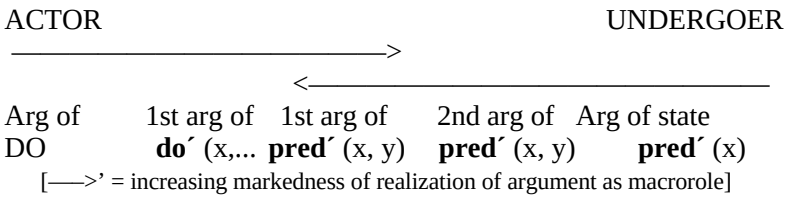

Figure 3: The Actor-Undergoer hierarchy

What the AUH says is that given a verb's LS, the leftmost argument will be the actor and the rightmost the undergoer. This is illustrated in Figure 4.

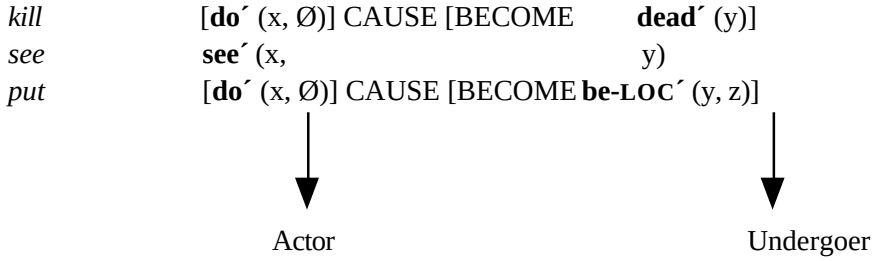

Figure 4: Macroroles as generalizations over thematic relations

With *kill*, the *x* argument is the first argument of **do´** (x, ... and is the leftmost argument in the LS; accordingly, it is the actor. The *y* argument, on the other hand, is the argument of a one-place state predicate and is therefore the rightmost argument in the LS; hence it is the undergoer. With respect to *see*, the *x* argument is the first argument of **predicate´** (x, y) and the *y* argument is the second argument of **predicate´** (x, y); consequently, the *x* argument is the actor and the *y* argument the undergoer. With regard to *put*, the *x* argument is the first argument of **do´** (x, ... and is the leftmost argument in the LS; accordingly, it is the

actor. The *y* argument, on the other hand, is the second argument of a **predicate´** (x, y) and is therefore the rightmost argument in the LS; hence it is the undergoer. Thus in each case, the leftmost argument in the LS is the actor and the rightmost is the undergoer.

No reference has been made to the thematic-relations labels of the arguments, as they are not directly irrelevant to macrorole assignment. It does not matter whether the actor argument is an effector or perceiver as long as it is the leftmost in the LS, and similarly it does not matter if the undergoer is theme, patient or stimulus, as long as it is the rightmost in the LS. This does not mean, however, that the relationship is purely formal and devoid of semantic content. The order of LS argument positions in the AUH in Figure 3 is exactly the same as the order in the semantic continuum in Figure 2. This means that the leftmost argument in the AUH is the most agent-like and the rightmost the most patient-like, and this captures the point made at the outset that the prototypical actor is an agent and the prototypical undergoer a patient. The fact that the AUH refers to LS argument positions rather than individual thematic relations further highlights the nature of actor and undergoer as generalizations across semantic argument types.

If one were to give a broad semantic characterization to each of the macroroles, the actor could be described as referring to the participant to which responsibility for the state of affairs is attributed, while the undergoer could be portrayed as referring to the participant which is most affected by the state of affairs. By 'responsibility for the state of affairs' is meant simply that the doer of an action is responsible for the action (and there could be no action without a doer) or that the cognizer is responsible for a cognitive state or event in that it would be impossible to have a cognitive state or event without a cognizer. Affectedness concerns whether a participant is affected in some way in a state of affairs; it may range from very great, as with the situations denoted by verbs like *crush, kill* and *smash,* to quite little, as with the states of affairs depicted by verbs like *see* and *like.*

There is an interesting asymmetry in the lexicalization of responsibility and affectedness in verbs that affects macrorole selection. It appear that verbs tend strongly to lexicalize the responsibility for the state of affairs they denote and do not permit variable assignments of responsibility. That is, when there is a single type of event, e.g. a transfer of something from one participant to another, which could be characterized in different ways in terms of which participant is responsible for the event (in this case, responsible for initiating the transfer), each possibility is realized by a distinct verb form, e.g. *give* vs. *take* or *sell* vs *buy* (in both instances, source as responsible vs. recipient as responsible), On the other hand, there are verbs in some languages which permit variable attribution of primary affectedness in the state of affairs, and this is reflected in differential undergoer selection in some instances. English illustrates this very well, as (4) and (5) show.

(4) a. The crew loaded the boxes onto the truck.
b. The crew loaded the truck with the boxes.
c. [**do´** (crew, Ø)] CAUSE [BECOME **be-on´** (truck, boxes)]

(5) a. The teacher taught Pashto to the students (but they didn't learn any).
b. The teacher taught the students Pashto (*but they didn't learn any).
c. [**do´** (teacher, Ø)] CAUSE [BECOME **know´** (students, Pashto)]

In the first pair of sentences, there are different choices for undergoer: *the boxes* is the unmarked choice in terms of the AUH in (4a), while *the truck* in (4b) represents a marked choice, since *the truck* is not the rightmost argument in the LS. There is a well-known difference in interpretation between the two sentences: in (4a) all of the boxes are loaded onto the truck, regardless of whether the truck is filled or not, whereas in (4b) the truck is filled to capacity, regardless of whether all of the boxes are loaded or not. Hence in (4a) the NP *the boxes* is taken as referring to the most affected participant, while in (4b) the NP *the truck* is so interpreted,

and these differences correlate with different undergoer choices. There is a semantic contrast between (5a) and (5b), albeit a somewhat different one, and it centers around *the students*. In (5a) the NP *the students* is not the undergoer, as it is marked by a preposition, and there is no implication that the students actually learned any Pashto. In (5b), on the other hand, this NP is the undergoer, and there is an implication that the students did in fact learn some Pashto, as the ungrammaticality of the added clause shows. Thus one could say that the students were more affected in the state of affairs denoted by (5b) than in the one denoted by (5a), because there is a strong implication that they learned something in (5b) but not necessarily in (5a). Not all variations in undergoer selection exhibit such a clear difference in affectedness as these pairs, but nevertheless they illustrate the semantic contrast which differential undergoer selection often entails.[5]

All of the examples discussed thusfar involve multiple-argument verbs, but there are of course many verbs which take only a single argument. How is macrorole selection determined for single argument verbs? The AUH is not relevant here, because a single argument is simultaneously the highest ranking and the lowest ranking argument on it. The default principles which govern macrorole selection with all verbs or other predicating elements are given in (6).

(6) 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 logical structure
    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.

Given an LS, the principle in (6a) predicts the number of macroroles a verb or other predicating element will have; we will return to it in the next section. More germane to the current topic is the principle in (6b), which deals with verbs which take only a single macrorole. The choice of macrorole is determined by the semantic structure of the verb, and the decisive feature is the presence of an activity predicate in the LS. Hence intransitive activity verbs like *run* (LS: **do´** (x, [**run´** (x)])) take an actor macrorole, while intransitive accomplishment verbs like *die* (LS: BECOME **dead´** (x)) take an undergoer macrorole. As with multiple-argument verbs, macrorole selection is firmly grounded in the semantic representation of the single-argument verb.

[5]For a detailed discussion of the RRG treatment of three-place verbs like *load* and *teach*, see Van Valin (2001).

3. Are macroroles syntactic or semantic?

This might seem like an odd question to ask, given the discussion in the previous section about the semantics of macroroles. It stems from two considerations. First, in RRG macroroles play a crucial role in the linking rules which relate syntactic and semantic representations to each other. The RRG linking system is summarized in Figure 5.

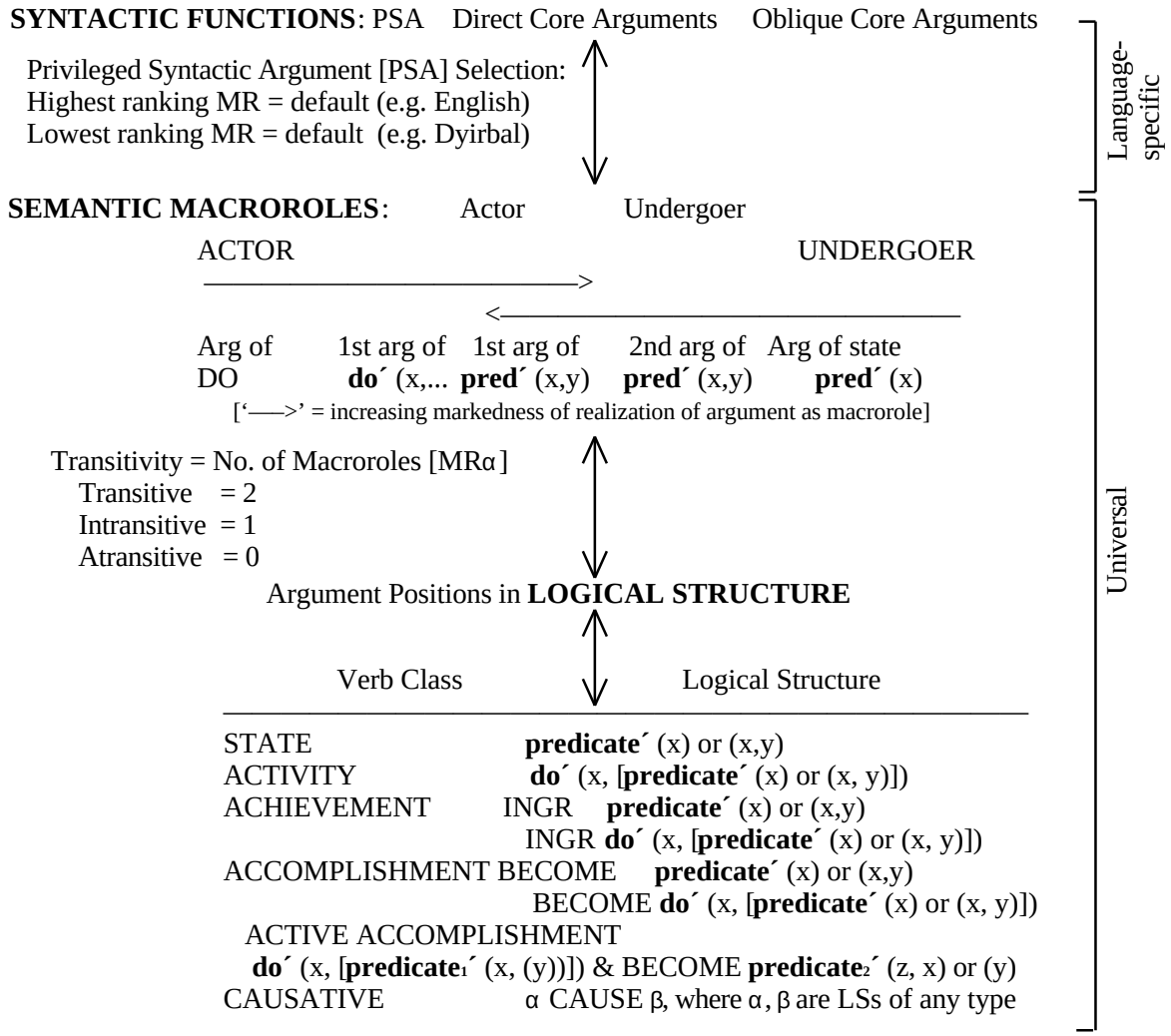

Figure 5: Summary of the linking system in RRG

They are also referred to in the RRG formulation of case assignment and agreement principles. For example, the basic case assignment principles for accusative languages are given in (7).

(7) Case assignment rules for German and Icelandic:
   a. Assign nominative case to the highest ranking macrorole argument.
   b. Assign accusative case to the other macrorole argument.
   c. Assign dative case to non-macrorole arguments (default).

Second, many approaches and many linguists assume some version of the thesis of the autonomy of syntax,

and accordingly for them, syntactic rules and principles should refer only to syntactic constructs, be they phrase structure configurations or syntactic relations. Hence, because syntactic rules and principles in RRG refer crucially to macroroles, from this perspective they must be syntactic relations, not semantic.[6]

RRG does not assume syntax to be autonomous, and consequently there is no theoretical problem with maintaining simultaneously that macroroles are semantic and that they play a role in the syntax.

An area in which the syntactic consequences of semantic macroroles are very important is transitivity. RRG distinguishes between the number of core arguments a verb or other predicating element takes, which it its *S[yntactic]-transitivity*,and the number of macroroles it takes, which is its *M[acrorole]-transitivity*, following Narasimhan (1998). From an RRG perspective, the M-transitivity of a verb is a better predictor of its syntactic behavior than its S-transitivity. The M-transitivity of a verb is predicted by the principles in (6a), but there are many exceptions, which is why they are characterized as 'default' macrorole assignment principles. RRG analyses locate the prime source of the irregularity of certain verbs in having fewer macroroles than the principles in (6a) would predict, and this irregular M-transitivity is marked in their lexical entries. For example, the German verbs *helfen* 'help' and *gefallen* 'please' are both S-transitive, but the differ from canonical transitive verbs by having nominative and dative arguments instead of nominative and accusative, as illustrated in (8).

(8) a. Der Mann hat dem/*den Knabe geholfen.
the.NOM man has the.DAT/the.ACC boy helped
'The man helped the child.'
b. Dem Mann gefällt der Knabe.
the.DAT man pleases the.NOM boy
'The man likes the boy', or 'The boy pleases the man.'
b´. Der Mann mag den Knabe.
the.NOM man likes the.ACC boy
'The man likes the boy.'

There are two ways one could analyze these verbs: as M-transitive, with irregular case marking and other properties, or as M-intransitive, with irregular transitivity in terms of (6a). If they are analyzed as M-intransitive, all of their other properties follow; only case marking will be discussed here. If *helfen* is M-intransitive (LS: **do´** (x, [**help´** (x, y)]), for (8a) **do´** (Mann, [**help´** (Mann, Knabe)])), then the single macrorole is an actor, following the principles in (6b). In terms of the AUH, the *x* argument would be the actor, and therefore it would be the highest ranking (in this instance, the only) macrorole and receive nominative case, following (7a). It would also be the subject, since in German only macrorole arguments can function as subject (privileged syntactic argument, in RRG terms). The *y* argument, on the other hand, is a non-macrorole core argument, and it would receive dative case, following (7c). Hence subject selection and case assignment in (8a) are accounted for readily by the analysis of *helfen* as M-intransitive. Similarly, if *gefallen* is M-intransitive (LS: **like´** (x, y), for (8b) **like´** (Mann, Knabe)), the the single macrorole is an undergoer, following the principles in (6b). In terms of the AUH, the *y* argument would be the undergoer, and

[6]Some approaches have in fact reinterpreted macroroles as syntactic, in order to preserve the assumption of the autonomy of syntax. For example, Manning (1996) proposes a syntactic notion of argument structure which is the interface between thematic relations and grammatical relations, analogous to macroroles (cf. Figure 1). There are two arguments at this level, one corresponding roughly to actor and the other to undergoer, but they are considered to be syntactic, not semantic. The analysis of ergativity that Manning proposes is basically the same as the RRG analysis of ergativity in terms of semantic macroroles, but his is formulated in terms of these syntactic relations. The two approaches differ when it comes to intransitive verbs: because Manning's relations are syntactic, he is forced to claim that all intransitive verbs take the same argument type, the one corresponding to actor in RRG. Thus his approach is in principle unable to deal with phenomena associated with split-intransitivity, for example.

therefore it would be the highest ranking (in this instance, the only) macrorole and receive nominative case, following (7a). It would also be the subject, for the same reason as in (8a). The *x* argument, on the other hand, is a non-macrorole core argument, and it would receive dative case, following (7c). Hence subject selection and case assignment in (8a) are accounted for readily by the analysis of *gefallen* as M-intransitive. Contrast *gefallen* with *mögen* 'like' in (8b´); it too has the LS **like´** (Mann, Knabe), but it is M-transitive, following (6a). This means that the *x* argument will be the actor and the *y* argument the undergoer, following the AUH, and this in turn entails nominative case for the actor and accusative case for the undergoer, following (7a,b). In the active voice the actor will be subject, thus yielding (8b´). The irregular behavior of *helfen* and *gefallen* is reduced to a single factor, irregular M-transitivity; they are completely regular in their case, agreement and other properties.[7]

It might be suggested that the fact that a particular argument may or may not be a macrorole, depending upon the verb, shows that macroroles are not in fact semantic in nature.[8] This is incorrect, for two reasons. First, transitivity is a lexical property which is related to the semantics of the verb. Exceptional transitivity is primarily, but not exclusively, a property of multiple-argument state predicates, i.e. predicates of possession, cognition, emotion, perception and internal sensation. It is rarely found with causative accomplishment verbs like *kill, smash, break, crush, destroy,* etc. In other words, verbs denoting actions with agentive effectors and highly affected patients are rarely M-intransitive, whereas verbs describing internal states of various kinds are often M-intransitive. This should not be surprising, given that the prototypical actor is an agent and the prototypical undergoer is a patient: neither argument of verbs denoting internal states fits the respective prototype. Second, the selection of the macrorole with M-intransitive verbs is determined semantically, not syntactically, by the principles in (6b). As discussed above, the single macrorole with *helfen* 'help' is an actor, while the single macrorole with *gefallen* 'please' is an undergoer, and this follows from the fact that *helfen* is an activity verb and *gefallen* is a state verb. Interestingly, there are virtually no exceptions to (6b) cross-linguistically, and this is unexpected and unexplained if macroroles were syntactic rather than semantic.

4. Why only two macroroles?

The question has often been raised, why are there only two macroroles? After all, there are three basic grammatical relations. If one equates actor with subject and undergoer with direct object, then why is there no macrorole corresponding to indirect object? This question is, in the first place, based on a misunderstanding of the relationship between macroroles and grammatical relations. There is no necessarily correlations between actor and subject, on the one hand, and undergoer and direct object, on the other, as the following Brazilian Portuguese examples and their English translations illustrate.

(9) a. Maria vendeu a casa.
'Maria [Actor] sold the house [Undergoer].'
b. A casa foi vendida por Maria.
'The house [Undergoer] was sold by Maria [Actor].'
c. Maria cantou.
'Maria [Actor] sang.'
d. A janela estava fechada.
'The window [Undergoer] was closed.'

[7]For detailed arguments for this analysis, see Van Valin & LaPolla (1997), §7.3.1.1.

[8]This is a significant difference between the RRG notion of macrorole and Dowty's notion of proto-role (1991); see Van Valin (1999) for a detailed critical comparison between the two concepts.

The actor argument is the subject in (9a) and (9c) but not in (9b), in which it is an adjunct. The undergoer is the direct object only in (9a); it is the subject in (9b) and (9d). Hence even in accusative languages like Brazilian Portuguese and English there is no direct correlations between macroroles and grammatical relations. Furthermore, when syntactically ergative languages are taken into account, this lack of correlation is reinforced: in active voice clauses, the undergoer is the 'subject' (the privileged syntactic argument, in RRG terms), while in antipassive clauses the actor functions as 'subject'.

Two possible justifications for a third macrorole are (1) labelling the third argument of a ditransitive verb, and (2) accounting for dative case assignment. These have no force in RRG. The third argument of a ditransitive verb is a non-macrorole core argument; in German, it would be a non-macrorole direct core argument, since it is not adpositionally marked, while in English it would be a non-macrorole oblique core argument in (5a), since it is adpositionally marked, but a non-macrorole direct core argument in (5b), since it is not. Dative case assignment is readily accounted for in terms of (7c), as the discussion of the German examples in (8) clearly showed.[9] It is also not obvious how a third macrorole would apply to the dative arguments of *helfen* 'help' and *gefallen* 'please' in any principled way.

There are strong empirical and theoretical reasons for rejecting the postulation of a third macrorole. First and foremost, it is highly likely that it would not be universal like actor and undergoer. While all languages have cores with two core arguments, some languages strongly disprefer and perhaps even do not permit three core arguments in a single core. Some serializing languages, e.g. Yoruba, Yatye (Stahlke 1970), fall into this category. In such languages, clauses with more than two arguments require core junctures in which the additional argument is a core argument of a second nucleus in a second core. So, for example, in expressing a transfer a verb meaning 'give' would be serialized with the transfer verb in order to express the recipient, or with a verb like 'break' or 'kill' a verb meaning 'take' or 'use' would be serialized in order to express the instrument.

Second, across languages which permit three core arguments, there is no consistent morphosyntactic treatment of the third argument. Actor and undergoer, on the other hand, do have certain consistent coding properties across languages: in active voice clauses they are always direct arguments of the verb, never oblique. What 'direct' means morphosyntactically varies from language to language: in English it means not being marked by a preposition; in German and Russian it means being case marked in a direct case and not marked by a preposition; in head-marking languages like Lakhota (Siouan) and Jakaltek (Mayan), it means being coded on the verb. In case-marking languages, actor and undergoer are either nominative and accusative or ergative and absolutive. By contrast, there is no consistent treatment of the third core argument (Faltz 1978): they may be a direct argument in the dative case, e.g. German, Russian, Dyirbal, or an oblique argument marked by an adposition, e.g. English, Jakaltek. Actor and undergoer are never oblique arguments within the core.

This raises a further issue: what exactly would count as a third macrorole? In a language like German or Russian, for example, it could be stricted to the third direct core argument of ditransitive verbs. But in a language like English, this would imply that only the *to*-PP with certain verbs would count as being the third macrorole. Why should this particular argument be so analyzed and not other oblique core arguments? In particular, if *to the students* is the third macrorole argument in (5a), then why shouldn't on the truck be given the same analysis in (4a)? Both PPs are omissible, and both can occur as 'direct object' in an alternative clause pattern, as (4b) and (5b) show. Furthermore, if *on the truck* has this status in (4a), then shouldn't *with the boxes* also be analyzed the same way in (4b)? In short, it is difficult to justify why some oblique core arguments should be analyzed as instantiating a third macrorole but not others, but if all oblique core arguments are so analyzed, then whatever function and semantic content it would have would be very different from that of the hypothesized third macrorole in German and Russian.

[9]When the full range of the use of the dative case is examined, especially its uses in complex sentence, explaining it in terms of a third macrorole would be quite impossible; see Van Valin & LaPolla (1997), §9.2.2.

Third, a third macrorole would be markedly less important for the syntax than actor and undergoer and hence is difficult to justify on syntactic grounds. It would play little or no role in subject selection with intransitive verbs. The single argument of an intransitive verb is either an actor or an undergoer in the vast majority of cases, and in those cases where the single argument is a non-actor or non-undergoer it does not correspond semantically to the third argument of three-argument verbs. It also plays no role in the major typology of syntactic systems: ergative vs. accusative vs. split-intransitive (e.g. Acehnese). These differences revolve around the treatment of actor and undergoer; the third argument of ditransitive verbs is not a factor.

Thus, a third macrorole would be a qualitatively different concept from the two semantic macroroles posited in RRG. It would not be universal, it would not receive consistent morphosyntactic treatment, and it would be relatively unimportant for the syntax. There is, then, no justification for positing a third macrorole and good reasons not to postulate one.

4. Conclusion

This paper has attempted to clarify a number of issues related to the concept of semantic macroroles in RRG. Actor and undergoer play a crucial role in the RRG linking system and in the formulation of grammatical rules and principles, and they have made possible the expression of important cross-linguistic generalizations about grammatical phenomena (see Van Valin 1999). The semantic nature of macroroles and their semantic basis have been presented, and it has further been argued that a theory like RRG needs only two macroroles, which correspond to the two primary arguments in a transitive predication.

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