Empirical Issues in Formal Syntax and Semantics 2

Selected Papers from the Colloque de Syntaxe et Sémanitique à Paris (CSSP 1997)

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Generalized Semantic Roles and the Syntax-Semantics Interface

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Generalized semantic roles, variously known as semantic macroroles or proto-roles, play a central role in the syntax-semantics interface in many monomorphemic syntactic theories. This paper reviews the major phenomena which have motivated the postulation of generalized semantic roles and evaluates critically some of the specific proposals that have been made, with special focus on the function the roles have in the syntax-semantics interface.

1 Introduction

The problems of argument selection and the syntax-semantics interface are central to grammatical theory and analysis, and a number of quite disparate theoretical approaches have posited GENERALIZED SEMANTIC ROLES (GSRs) as a crucial part of their account of these issues: Functional Grammar [FG] (Dik 1989), HPSG (Davis 1996, Davis and Koenig 1977), Role and Reference Grammar [RRG] (Van Valin 1977, 1993; Foley and Van Valin 1984; Van Valin and LaPolla 1997), as well as Dowry’s (1991) theory of semantic proto-roles, Kibrik’s (1985, 1987, 1997) theory of semantic hyperroles, and Jackendoff’s (1990) theory of roles on an action tier. All of the approaches save Jackendoff’s are tied to monomorphemic theories of syntax which posit only a single level of syntactic representation corresponding roughly to what was traditionally called ‘surface structure’. GSRs have very important functions in theories of this type, as they express many of the same generalizations captured in terms of deep structure subject and object in classical transformational grammar, D-structure external and internal arguments in GB, and initial 1 and 2 in Relational Grammar. The purpose of this paper is (1) to review the major phenomena which have motivated the postulation of GSRs and (2) to evaluate critically some of the specific proposals that have been made, with special focus on the function the roles have in the syntax-semantics interface.
The essential insight motivating the postulation of GSRs is that despite the plethora 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 different levels of generality. The first is what will be called 'verb-specific' semantic roles, e.g. runner, killer, bearer, 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 GSRs, which are generalizations across thematic relations. The terms to be used for these two arguments are 'actor' and 'undergoer'; originally introduced in RRG, they have become widely used. Actor is a generalization across agent, experiencer, instrument and other roles, while undergoer is a generalization subsuming patient, theme, recipient and other roles. The exact details of these neutralizations vary from theory to theory. The relationships among the three types of semantic roles are summarized in Figure 1.

The neutralizations in Figure 1 do not represent the full range found with all classes of verbs, but they are representative. With a verb like receive, for example, the recipient argument would be an actor, as shown by the existence of the actor nominalization receiver.

2 Motivation for Posting Generalized Semantic Roles

2.1 Subject selection and voice

A crucial feature of all approaches is the distinguishing of GSRs from grammatical relations; they all distinguish actor from subject and undergoer from direct object. This can be seen most clearly in three phenomena. First, in a language like English, the syntactic subject can be either an actor (active voice) or an undergoer (passive voice). Since these theories are monotranslational, they cannot posit any abstract or underlying
grammatical relations which are changed in the course of a derivation. The notions of actor and undergoer capture generalizations across verb types that are expressed by underlying grammatical relations in derivational theories. Second, in clauses with intransitive verbs, the syntactic subject may be either an actor or an undergoer, depending upon the class of the verb, and this has been argued by some to be the basis of the unaccusative/energative distinction. The syntactic analysis of this in terms of some intransitive subjects being underlying syntactic objects is likewise unavailable to these approaches. The Spanish examples in (1) illustrate these first two points.

(1) a. María cerró la puerta. Spanish
   'María [Actor] closed the door [Undergoer].'
   b. La puerta fue cerrada por María.
   'The door [Undergoer] was closed by María [Actor].'
   c. María cerró.
   'María [Actor] sang.'
   d. María murió.
   'María [Undergoer] died.'

Third, syntactically ergative languages provide evidence for this distinction. In these languages, e.g. Yidg (Dixon 1977), the default selection for syntactic subject is the undergoer, not the actor as in syntactically accusative languages like English, and there is a marked voice construction, the antipassive, which permits the actor to function as syntactic subject. This is illustrated by the Yidg examples in (2).1

(2) a. Mayi-Ø grguvalm de madya-Ø. Yidg
   foot-ABS butterfly-ERG stuck-PAST
   'The butterfly [Actor] was sticking nectar [Undergoer].'
   b. Gunge-nb-ar-Ø mayi-Ø. madya-dy-Ø.
   butterfly-ABS foot-LOC stuck-ANT'I-1NS
   'The butterfly [Actor] was sticking nectar [Undergoer].'
   c. Bipa-Ø mangu-Ø.
   woman-ABS laugh-PAST

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1 Abbreviations: A 'actor', ABS 'abstructive', ACT 'actor voice', ANTI 'antipassive', APL 'applica-
   ive', DAT 'dative', DEF 'definite', DEIC 'deictic', ERG 'ergative', INAN 'inanimate', IND 'indicative', non-MR 'non-morereal', ORI, 'obligated', PASS 'passive', PAST 'past tense', PNOM 'proper noun marker', POSS 'possessive', PRES 'present tense', PURP 'purposive', TNS 'tense', U 'undergoer', UND 'undergoer voice'. Arabic numerals in the Yidg examples refer to noun classes.

An important claim in some of these approaches is that processes which select the argument to function as actor and the one to function as undergoer work the same in both types of language and that the major difference between the two language types is the way GSRs are realized in terms of grammatical relations. This is summarized in Table 1.

<table>
<thead>
<tr>
<th>Syntactic System</th>
<th>Default choice for subject</th>
<th>Choice for subject requiring special construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accusative</td>
<td>Actor</td>
<td>Undergoer [passive]</td>
</tr>
<tr>
<td>Ergative</td>
<td>Undergoer</td>
<td>Actor [antipassive]</td>
</tr>
</tbody>
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Table 1: Subject choices in accusative and ergative systems

2.2 Applicative constructions

A good example of how the selection of arguments to function as GSRs works the same in both accusative and ergative systems can be found in the analyses of applicative constructions proposed in RKG (Van Valin 1993) and FG (Dik 1989). Applicative constructions have been traditionally characterized as involving the appearance as direct object of an argument that would normally appear as an indirect or oblique object. Applicatives in two accusative languages, Indonesian (Dardjiwidjaja 1971) and Swahili (Driever 1976, Vitale 1981) are presented in (3) and (4); analogous constructions from two syntactically ergative languages, Sama (Philippines; Walton 1986) and Dyirbal (Dixon 1972), are given in (5) and (6).

(3) a. Ali mung-kiriran surat tis ke pada Hasan. Indonesian
   'Ali sent the letter to Hasan.'
   ACTIVE: send letter DEF
   Direct object = undergoer (theme)
   b. Surat tis dikirir ke pada Hasan oleh Ali. letter DEF PASS-send to by

   'Ali sent the letter to Hasan.'
   ACTIVE: send letter DEF
   Direct object = undergoer (theme)
With respect to Indonesian and Swahili, these two analyses seem to be equivalent, but they make very different claims with regard to syntactically ergative languages like Sama and Dyirbal. (Only pronouns are case-marked in Sama; full NPs are marked as oblique by the preposition *ma*.)

(5) a. Bili ku tumpa ma si Andi. Sama
buy 1sgSG-3SG.OBL PN1 PN2 Andy
'I bought the shoes for Andy.'

b. Bili-an bu ku si Andi tumpa'.
buy-APL-3SG.OBL PN1 PN2 Andy shoe
'I bought Andy some shoes.'

(6) a. Bi-yi. yega-Ø yega-ga dynas-µa.
Dyirbal
DESC-ABS4 sing-ABS wood-LOC stand-TNS
'The man is standing in/on some wood.'

b. Bi-ks-Ø yega-Ø be aga-1 yega-ga dynas-µa.
DESC-ABS-IV wood-ABS DESC-ERG-1 sing-ERG stand-APL-TNS
'The man is standing on with some wood.'

The absolutive NP is the syntactic subject for many constructions in these languages, and the addition of the applicative morpheme (<ns in Sama and *-mal in Dyirbal) results in an alternative choice for the absolutive NP, hence an alternative choice for *subject*, not direct object as in (3) and (4).

It appears that two accounts are required for the languages in (3)-(6): in syntactically accusative languages, applicative constructions yield an alternative choice for direct object, while in syntactically ergative languages, they result in an alternative choice for subject. The GSR-based analysis, on the other hand, applies equally to all four languages. Applicative constructions involve an alternative undergoer choice (or, in the case of Dyirbal, adding an undergoer argument to the clause), and this is true of each of the languages. The differences among them arise from the linking between GSRs and grammatical relations summarized in Table 1: in Indonesian and Swahili the undergoer is the direct object in an active-voice clause and subject in a passive clause, whereas in Sama and Dyirbal it is the subject in an active-voice (i.e. non-antipassive) clause. Thus, the GSR-based analysis captures an important generalization about
applicative constructions that analyses positing only thematic relations and grammatical relations miss.

2.3 Reflexive binding

Reflexive binding is another phenomenon which has been analyzed in terms of GSRs, e.g. Van Valin and LaPolla 1997. Universally, actors bind undergoers in the prototypical case (formulating the finding of Faltz 1985 in terms of GSRs), as in (7a).

(7) a. James saw himself.  Actor binds undergoer
    b. Sam told Mike about himself. Actor or undergoer binds non-MR

For a language like English, the GSR binding hierarchy is Actor > Undergoer > non-MR, as shown in (7a,b). In English, it is difficult to distinguish binding conditions stated in terms of grammatical relations (or even c-command) from those stated in terms of GSRs, but in Toba Batak (Indonesia; Shagamoto 1984) it is possible to differentiate them. Toba Batak is a VOS language in which the clause-final NP is the subject/external argument, and the NP immediately following the verb is the direct object/internal argument. Transitive verbs carry a prefix indicating the alignment of GSRs with NPs in the clause: the prefix *man* indicates that the actor is the subject/external argument, and *di*-signals that the undergoer is the subject/external argument. These are not labelled 'active' and 'passive', because the actor in the *di-* form does not appear as an oblique; rather it appears as the internal argument. This is shown in (8).

(8) a. Mang-ida si Torus. Toba Batak
    ACT-see PNM PNM
    'Torus sees Ria.'
    b. Di-ida si Torus si Ria.
    UND-see
    'Torus sees Ria.'
    c. Mang-ida si Torus si Ria
    ACT-see
    'Ria sees Torus.'
    d. Di-ida si Ria si Torus.

Sentences (8a,c) represent the canonical arrangement from an English perspective: the actor is the subject/external argument, and the undergoer is the direct object/internal argument. In (8b,d), on the other hand, the actor is the internal argument and the undergoer is the subject/external argument. We can now compare the GSR binding hierarchy above with a relational hierarchy of the kind assumed in Relational Grammar or Lexical-Functional Grammar and with Principle A of the GB binding theory.

(9) a. Mang-ida diri-na si Torus. Toba Batak
    ACT-see self-3rgPPOSS
    'Torus sees himself.' Actor binds undergoer
    b. *Di-ida diri-na si Torus.
    UND-see self-3rgPPOSS
    'Himself sees Torus.' *Undergoer binds actor
    c. Di-ida si Torus diri-na.
    UND-see self-3rgPPOSS
    'Torus sees himself.' Actor binds undergoer
    'Himself sees Torus.' *Undergoer binds actor

All three accounts correctly predict the grammaticality of (9a) and the ungrammaticality of (9d), since (9a) meets the binding conditions, however formulated, and (9d) violates them. However, neither syntactic account predicts the ungrammaticality of (9b) and the grammaticality of (9c). In (b) *si Torus* is the subject and c-commands the internal argument *diri-na 'himself', and yet the sentence is ungrammatical. The GSR analysis predicts this, however, because the antecedent *si Torus* is the undergoer and therefore lower on the GSR binding hierarchy than *diri-na 'himself', the actor. In (c), on the other hand, the binder *si Torus* is the internal argument and does not c-command the subject/external argument *diri-na 'himself'. Nevertheless the sentence is grammatical, because *si Torus* is the actor and *diri-na* the undergoer, which follows the GSR binding hierarchy.
One might well ask, why are GSRs necessary for this analysis? An account of the kind proposed in Jackendoff 1972 based on a thematic relations hierarchy would make exactly the same predications. Pollard and Sag 1992 present an interesting argument against Jackendoff’s account; the crucial data are given in (10).

(10) a. I sold the slave to himself.
    b. I sold the slave himself.

In (10a) the *slave* is a theme and *himself* is a recipient, whereas in (b) the *slave* is a recipient and *himself* a theme. Every thematic relations hierarchy proposed, including Jackendoff’s, ranks one of these relations higher than the other, and no matter which ranking is chosen, one of the sentences will be a counterexample to the claim that the higher ranking thematic relation bearing argument always binds a lower ranking argument. These sentences are not a problem for the GSR binding hierarchy, however. In both sentences *I* is the actor, the *slave* is the undergoer and *himself* is ‘non-MR’, and in both the undergoer binds the ‘non-MR’, in conformance with the GSR binding hierarchy. The data in (9)-(10) show that an account of reflexive binding based on GSRs is superior (for at least this range of data) to accounts based on grammatical relations, thematic relations or e-command.

2.4 Obligatory control

The final phenomenon to be discussed in this section is obligatory control. There is a huge literature, dating back to the 1960’s, on the issue of determining the controller in the matrix clause. A number of syntactic and semantic approaches have been proposed, but virtually all of them require stipulating, in one way or another, the control properties of verbs like *promise*, i.e. transitive verbs with subject control. Syntactic accounts

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See Van Valin and LaPolla (1997) for application of this account to a wide range of reflexive binding phenomena.

are either constituent-structure based, i.e. the minimal distance principle (Rosenbaum 1967) and its descendents (e.g. Chomsky 1981), or relational, e.g. the principle of functional control in Bresnan 1982. Foley and Van Valin 1984 proposed a semantic theory which correctly predicts the obligatory control facts of all verbs without stipulation; it was adopted into HFSG in Sag and Pollard 1991 and was further developed within RRG by Cutrer 1993 and Van Valin and LaPolla 1997. It is given in (11).

(11) Theory of obligatory control:
1. Causative and passive verbs have undergoer control.
2. All other verbs have actor control.

The principles in (11) apply to transitive matrix verbs in obligatory control constructions; there is no choice of controller in such a construction when the matrix verb is intransitive. Verbs like *force* and *make* are causative, while verbs like *persuade* and *order* are jussive. Hence they have undergoer control. The choice of controller follows from the basic structure of causative and jussive events: the actor acts on the undergoer in some way, in order to get the undergoer to do something. *Promise*, on the other hand, is neither causative nor jussive, and therefore is predictable to have actor control, which is the case.

In order to illustrate how (11) works, we will now survey some obligatory control facts from a typologically disparate group of languages. It should be noted that verbs like *promise* in obligatory control constructions are relatively rare cross-linguistically, and consequently we have only one example in the data below. The first two languages to be examined are syntactically ergative, Dyirbal and Sama.

(12) a. *Ba-yi* *yaŋ-gi* *waŋ-ma* *waŋ-pi*-li. Dyirbal
   DEIC-ABS-I main-ABS get up-TNS go uphills-PURP
   "The man got up to go uphill."

b. *Ba-la*-n *yaŋ-gi* *ku-ma* *ku-ma*-li
   DEIC-ABS-II neither-ABS DEIC-ERG-I father-ERG tell-TNS return-PURP
   "Father told mother to return."

(13) a. *Baŋya*’ *aku* N-p*-li
   Sama
   want 1sgABS ANT-1buy bread
   "I want to buy some bread."
Finally, we look at two languages which have been argued to lack grammatical relations altogether: Acehnese (Indonesia), which Durie 1985 argues uses GSRs rather than subject and object for its grammatical relations, and Mandarin Chinese, which has been argued to be topic-prominent rather than subject-prominent (Li & Thompson 1976). Yet here again the control facts are the same as in the other languages we have looked at.

(15) a. Gua-wen [t’go-eun bu].
   3A-want 3A-cook rice
   'She wants to cook rice.'

b. Gua-sse bu [t’lo-hoeng kwahp].
   3A-order 3sg I (t’lo) make cake
   'I ordered me to make a cake.'

    1sg want eat rice
    'I want to eat (rice).'

b. Ti jiao shi xi zu.
    3sg teach 1sg write characters
    'She teaches me to write characters.'

We have briefly examined a typologically disparate group of languages and found that the control facts are the same in all of them: they all follow the principles in (11), regardless of whether they are syntactically ergative or accusative, head marking or dependent marking, free or fixed word order, subject-prominent or topic-prominent.

Thus, GSRs are important for the analysis of a variety of important grammatical phenomena and provide the basis for capturing linguistically significant generalizations in monostral syntactic theories.

3 Differences among theories

There are three issues with respect to which the theories using GSRs will be compared: (1) the status of thematic relations in the theory, (2) whether the GSRs constitute an actual relation which an argument may bear or is simply a generalization about argument selection, and (3) whether GSRs are discrete or non-discrete categories.
With respect to the first issue, Jackendoff, Dik, Kilbride and early RRG (Foley and Van Valin 1984) posit both specific thematic relations like agent, instrument, experiencer, theme and patient and GSRs, while Dowty and current RRG (Van Valin 1996; Van Valin and LaPolla 1997) deny theoretical status to the specific thematic relations; in current RRG they are mnemonics for argument positions in decompositional lexical representations of verbs. In recent work HPNSG operates in terms of verb-specific thematic relations, e.g. ‘killer’, ‘seem’, ‘giver’, ‘knower’, etc. and GSRs (Davis 1996, Davis and Koenig 1997). In general, whether a theory recognizes two types of semantic roles is a function of its system of lexical representation; if a theory, e.g. FG, uses specific thematic relations as part of its lexical representation for verbs, then it will end up treating GSRs as an additional type of semantic role. In theories in which lexical representation is not based on thematic relations, e.g. Dowty’s and RRG, then it is not necessary to have both types of roles. Jackendoff’s theory is the most complex, as it has decompositional representations for verbs but also posits several tiers of semantic roles in addition.

The second and third issues distinguish Dowty’s approach from the rest. Dowty denies explicitly that his ‘proto-agent’ and ‘proto-patient’ are actual semantic roles that an argument may have; rather, they are simply generalizations about the subject- and object-selection properties of verbs. To say that an argument is the ‘proto-agent’ with a verb is simply to state that by virtue of its possessing certain semantic properties the argument will be selected as subject in a sentence with that verb. ‘Proto-agent’ and ‘proto-patient’ are not roles that grammars makes reference to; there are no rules referring to these notions in the syntax of languages. In the other approaches, however, GSRs do play an important role in the formulation of morphosyntactic rules, principles and/or constraints.

If GSRs are not in fact actual grammatical statuses that an argument may have, then they need not be discrete categories with well-defined criteria for assigning arguments to them, and Dowty makes just this claim: "Proto-roles...do not classify arguments exhaustively (some arguments have neither role) or uniquely (some arguments may share the same role) or discretely (some arguments could qualify partially but equally for both proto-roles." (576) The other approaches treat GSRs as discrete categories. While Dowty’s claim is clearly related to his view of the nature of GSRs, it is logically distinct from it; one could maintain that GSRs are roles that arguments bear, as the other approaches do, and at the same time assert that they are fuzzy categories. The main place this non-discreteness would manifest itself would be in lexicalization, in those cases in which the two primary arguments of a verb have properties of both GSRs; the choice of argument as proto-agent or proto-patient with verbs of this kind would then vary, apparently arbitrarily, both within languages and cross-linguistically. Dowty argues that by positing GSRs as ‘fuzzy, indeterminate’ categories, variations in lexicalization of verbs with very similar meanings can be accounted for. One of the primary examples that he gives of this is buy vs. sell. In his analysis, the same event is denoted by both verbs, with the buyer and seller each having some proto-agent and some proto-patient properties, and therefore either argument can be realized as subject, the choice of verb correlating with the selection of the buyer or the seller as subject. Neither argument is exclusively a proto-agent or a proto-patient. There is considerable evidence that this analysis is not correct, however. If buy and sell are variable lexicalizations of the type Dowty maintains, then one would expect that if languages derive one of the verbs from the other, then some languages should derive buy from sell and others sell from buy. But this is not the case; all instances of this derivation that I am aware of treat buy as basic and derive sell from it, e.g. German kaufmen ‘buy’ → verkauften ‘sell’, Lakhota ohpēhpē ‘buy’ → iydpēpēya ‘sell’, and Tagalog bili ‘buy’ → magbili ‘sell’. The most common pattern is for ‘sell’ to be ‘cause to buy’; this
is signalled by the causative suffix _-ya in Lakbota and the prefix _marg- in Tagalog. There is evidence in English as well that they two are not equivalent. There are situations in which only one of them is appropriate; while it is possible to say Chris bought a pack of cigarettes from the vending machine in the hall, it is impossible to say *The vending machine in the hall sold Chris a pack of cigarettes, because one does not normally describe what a machine does as selling. Thus, selling always entails buying but buying does not entail selling, and this argues against analyzing them simply as alternative lexicalizations of the same event. Dowty’s other examples of possible variable lexicalizations, e.g. like vs. please, likewise do not stand up under close scrutiny (as he himself notes), and hence it may be concluded that there is no empirical evidence in favor of a view of GSRs as ‘fuzzy, indeterminate’ entities.

4 Conclusion

What is striking about GSRs is that researchers from very different traditions in linguistics have come up with very similar ideas: Dowty out of formal semantics, Jackendoff out of generative grammar, DiK out of European functionalism, Kibrik out of Soviet/Russian linguistic theory, and Van Valin out of a functional-typological tradition. The convergence of these divergent research traditions onto the common notion of GSRs shows the significance of GSRs for linguistic theory and analysis.

References


