

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 monostratal 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 Dowty's (1991) theory of semantic proto-roles, Kibrik's (1985, 1987) 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 monostratal 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, 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 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.

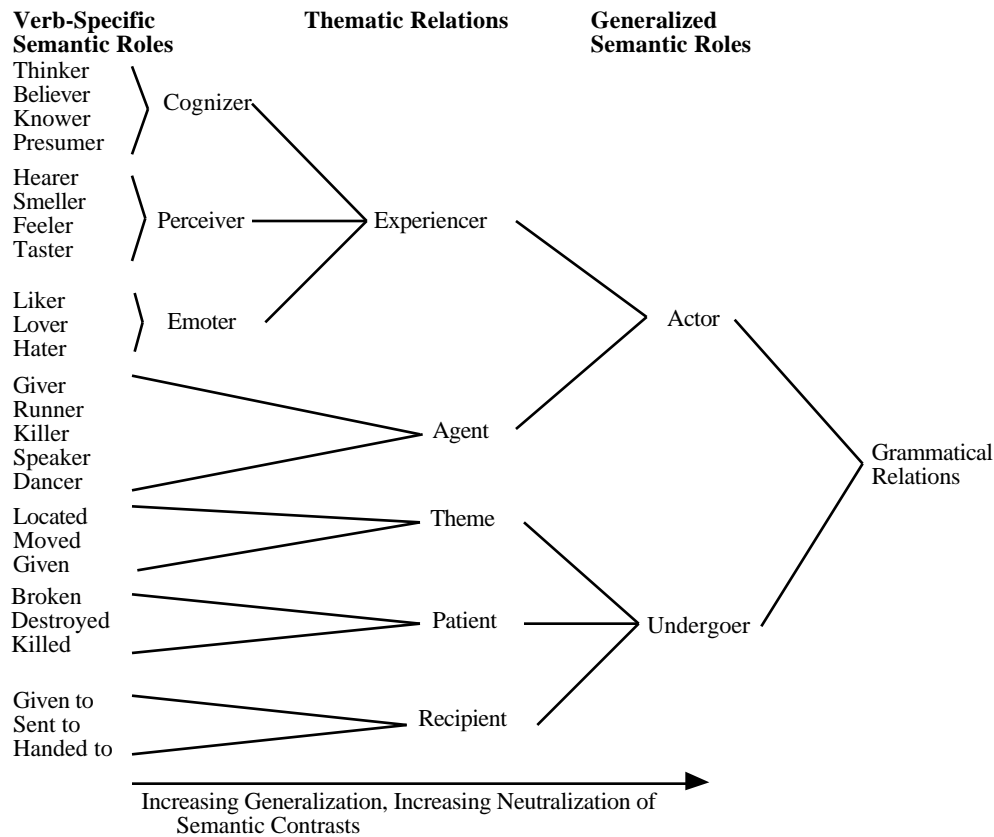


Figure 1: Relation of generalized semantic roles to thematic relations

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 Positing Generalized Semantic Roles

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 monostratal, 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/unergative 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. Maria cerró la puerta. Spanish
 ‘Maria [Actor] closed the door [Undergoer].’
 b. La puerta fue cerrado por Maria.
 ‘The door [Undergoer] was closed by Maria [Actor].’
 c. Maria cantó.
 ‘Maria [Actor] sang.’
 d. Maria murió.
 ‘Maria [Undergoer] died.’

Third, syntactically ergative languages provide evidence for this distinction. In these languages, e.g. Yidij (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 Yidij examples in (2).¹

1 Abbreviations: A ‘actor’, ABS ‘absolutive’, ACT ‘actor voice’, ANTI ‘antipassive’, APL ‘applicative’, COM ‘comitative’, DAT ‘dative’, DEF ‘definite’, DEIC ‘deictic’, ERG ‘ergative’, INAN ‘inanimate’, IND ‘indicative’, LOC ‘locative’, OBL ‘oblique’, PASS ‘passive’, PAST ‘past tense’, PNM ‘proper noun marker’, POSS ‘possessive’, PRES ‘present tense’, PURP ‘purposive’, TNS ‘tense’, U ‘undergoer’ UND ‘undergoer voice’. Arabic numerals in the Swahili examples and Roman numerals in the

- (3) a. Ali meng-(k)irim surat itu kepada Hasan. Indonesian
 ACTIVE-send letter DEF to
 ‘Ali sent the letter to Hasan.’ Direct object = undergoer (theme)
- a´. Surat itu di-kirim kepada Hasan oleh Ali.
 letter DEF PASS-send to by
 ‘The letter was sent to Hasan by Ali.’
- a´´.*Hasan di-kirim surat itu (kepada) oleh Ali.
 PASS-send letter DEF (to) by
 ‘Hasan was sent the letter (to) by Ali.’
- b. Ali meng-(k)irim-kan Hasan surat itu. Direct object = undergoer (recipient)
 ACTIVE-send-APL letter DEF
 ‘Ali sent Hasan the letter.’
- b´. Hasan di-kirim-kan surat itu oleh Ali.
 PASS-send-APL letter DEF by
 ‘Hasan was sent the letter by Ali.’
- b´´.*Surat itu di-kirim-kan Hasan oleh Ali.
 letter DEF PASS-send-APL by
 ‘The letter was sent Hasan by Ali.’
- (4) a. Badru a-li-andik-a barua (%kwa Juma).² Swahili
 1-PAST-write-IND letter to
 ‘Badru wrote a letter (to Juma).’ Direct object = undergoer (patient)
- a´. Barua i-li-andik-w-a na Badru (%kwa Juma).
 letter 9-PAST-write-PASS-IND by to
 ‘The letter was written (to Juma) by Badru.’
- b. Badru a-li-mw-andik-i-a Juma barua.
 1-PAST-1-write-APL-IND letter
 ‘Badru wrote Juma a letter.’ Direct object = undergoer (recipient)
- b´. Juma a-li-andik-i-w-a barua na Badru.
 1-PAST-write-APL-PASS-IND letter by
 ‘Juma was written a letter by Badru.’
- b´´.*Barua i-li-mw-andik-i-w-a Juma na Badru.
 letter 9-PAST-1-write-APL-PASS-IND by
 ‘The letter was written Juma by Badru.’

² The ‘%’ indicates that not all speakers accept these sentences with *kwa Juma*.

Standard analyses of applicative constructions posit that they make possible an alternative choice for direct object. The patient or theme is the default choice in (3a) and (4a), and only the direct object of an active verb can serve as the subject in a passive construction, as (3a', a'') and (4a') show. In the applicative constructions in (3b) and (4b), the recipient is the direct object, and it, not the patient or theme, can serve as the subject of the passive versions of these sentences, as shown in (3b', b'') and (4b', b''). An alternative analysis in terms of GSRs would claim that what is involved here is not an alternative choice for direct object but rather an alternative choice for undergoer. In these languages, undergoer is the default choice for direct object and the only argument that can serve as the subject of a passive construction.

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.

- (5) a. B'lli ku taumpa' ma si Andi. Sama
 buy 1sgERG shoes OBL PNM Andy
 'I bought the shoes for Andy.' Subject = undergoer (theme)
- b. B'lli-an ku si Andi taumpa'.
 buy-LOC 1sgERG PNM Andy shoes
 'I bought Andy some shoes.' Subject = undergoer (benefic.)
- (6) a. Ba-yi yaɾa-∅ yugu-ŋga dyana-ŋu Dyirbal
 DEIC-ABS.I man-ABS wood-LOC stand-TNS
 'The man is standing in/at/on some wood.' Subject (intr.) = actor
- b. Ba-la-∅ yugu-∅ ba-ŋgu-l yaɾa-ŋgu dyanay-ma-n
 DEIC-ABS-IV wood-ABS DEIC-ERG-I man-ERG stand-COM-TNS
 'The man is standing on/with some wood.' Subject = undergoer (location)

The absolutive NP is the syntactic subject for many constructions in these languages, and the addition of the applicative morpheme (*-an* 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 undergoer is the direct object in an active clause and subject in a passive clause, whereas in Sama and Dyirbal it is the subject in a basic clause. Thus, the GSR-based analysis captures an important generalization about applicative constructions that analyses positing only thematic relations and grammatical relations miss.

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 (reformulating the finding of Faltz 1985 in terms of GSRs), as in (7a).

- (7) a. James_i saw himself_i. Actor binds undergoer
b. Sam_j told Mike_j about himself_{i/j}. Actor or undergoer binds PP object

For a language like English, the GSR binding hierarchy is Actor > Undergoer > Other, 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; Shugamoto 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(g)-* signals 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 Ria 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.
UND-see
'Ria sees 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-3sgPOSS | | |
| | 'Torus sees himself.' | | Actor binds undergoer |
| b. | *Di-ida diri-na | si Torus. | |
| | UND-see self-3sgPOSS | | |
| | *'Himself sees Torus.' | | *Undergoer binds actor |
| c. | Di-ida si Torus diri-na. | | |
| | UND-see self-3sgPOSS | | |
| | 'Torus sees himself.' | | Actor binds undergoer |
| d. | *Mang-ida si Torus diri-na. | | |
| | *'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 *dirir-na* 'himself', and yet the

sentence is ungrammatical. The GSR analysis predicts this, 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 ‘other’, and in both the undergoer binds the ‘other’, 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 data³) to accounts based on grammatical relations, thematic relations or c-command.

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 are either constituent-structure

³ See Van Valin and LaPolla (1997) for application of this account to a wide range of reflexive binding phenomena.

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) a semantic theory was proposed which correctly predicts the obligatory control facts of all verbs without stipulation; it was adopted into HPSG 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 jussive 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 predicted 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 yaɾa-∅ walma-ŋu wayŋdyi-li. Dyirbal
 DEIC-ABS.I man-ABS get.up-TNS go.uphill-PURP
 ‘The man got up to go uphill.’
- b. Ba-la-n yabu-∅ ba-ŋgu-l ŋuma-ŋgu giga-n banagay-gu.
 DEIC-ABS-II mother-ABS DEIC-ERG-I father-ERG tell-TNS return-PURP
 ‘Father told mother to return.’

- (13) a. Baya' aku N-b'lli tinapay. Sama
want 1sgABS ANTI-buy bread
'I want to buy some bread.'
- b. Logos ku iya N-k'llo daing ma si ina'.
persuade 1sgERG 3sgABS ANTI-get fish OBL PNM mother
'I persuaded him to get fish for mother.'
- c. Janji' ku iya bayad-an saung.
promise 1sgERG 3sgABS pay-LOC tomorrow
'I promised him to pay [him] tomorrow.'

These two languages pose particularly interesting challenges for syntactic theories of control. As Van Valin (1992) argues, if one assumes the constituent structure appropriate to the configurational theory of control, other GB principles are violated. In relational terms, the controller in the clauses with jussive verbs in (12b) and (13b) is the subject, not the direct object, since these languages are syntactically ergative. Moreover, in the Sama example with *janji'* 'promise' in (13c), the controller is not the subject (which is the absolutive pronoun *iya* '3sg'). Hence a relational account would have to have a different grammatical relations hierarchy from the one posited for English and other syntactically accusative languages. In GSR terms, however, the principles in (11) predict the control facts correctly. In (12b) and (13b), which have jussive verbs, undergoer control is predicted, and in (13c), which has a verb which is neither causative nor jussive, actor control is predicted. The fact that these languages are syntactically ergative or have free or fixed word order is irrelevant to the determination of the controller in terms of (11).

The next examples are from Lakhota, a head-marking language. Since all core arguments are coded on the verb, the verb(s) alone can constitute a complete sentence, and therefore their constituent structure, such as it is, would be very different from a language like English. Yet the control facts are exactly the same, as (14) shows.

- (14) a. Wówapi ki Ø-yawá i-bl-úthe. Lakhota
book the INAN-read stem-1sgA-try
'I tried to read the book.'
- b. Wówapi ki hená Ø-yawá-wičha-wa-ši.

book the those INAN-read-3plU-1sgA-tell
'I told them to read those books.'

Finally, we look at two languages which have been argued to lack grammatical relations altogether: Acehnese (Indonesia), which Durie (1985) argues 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. Geu-tém [(**geu-*)taguen bu]. Acehnese
3A-want (3A-) cook rice
'She wants to cook rice.'
- b. Geu-yue lôn [(**lôn-*)peugöt kuwéh].
3A-order 1sgU (1sgA-)make cake
'(S)he ordered me to make a cake.'
- (16) a. Wǒ yào chī fàn. Mandarin Chinese
1sg want eat rice
'I want to eat (rice).'
- b. Tā jiāo wǒ xě zì.
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 monostratal syntactic theories.

3 Differences among theories

There are three issues with respect to which the approaches 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 they are discrete or non-discrete categories.

With respect to the first issue, Jackendoff, Dik, Kibrik 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 recent work HPSG operates in terms of verb-specific thematic relations, e.g. ‘killer’, ‘seen’, ‘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 actor or undergoer 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 as subject/actor with *buy* and the seller in this function with *sell*. 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 *kaufen* ‘buy’ *verkaufen* ‘sell’, Lakhota *ophéthųbuy* ‘buy’ *iyópheya* ‘sell’, and Tagalog *bili* ‘buy’ *mag-bili* ‘sell’. The most common pattern is for ‘sell’ to be ‘cause to buy’; this is signalled by the causative suffix *-ya* in Lakhota and the prefix *mag-* 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 generalized semantic roles is powerful evidence of their significance for linguistic theory and analysis.

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