Participant roles

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1 Overview of participant roles and of role-related notions

Participant roles capture certain generalizations about the participation of entities in eventualities denoted by linguistic expressions regarding such issues as who did it, who it happened to and what got changed. Participant roles are found under a number of different names in the linguistic literature including thematic relations or roles (e.g. Jackendoff (1990); Parsons (1995); Davis (2011)), deep cases (e.g. Fillmore (1968)), theta-roles (e.g. Chomsky (1981); Reinhart (2002); Everaert (2012)) and semantic roles. Here we will refer to “participant roles” or “semantic roles”. Among the linguistic expressions describing eventualities verbs play an important part as they select the widest range of participant roles. Thus, for example, work, as in John is working, has one participant role, which may be characterized as the agent, while love in John loves his wife selects two roles, an “experiencer” and a “theme” (these categories will be explained below). However, nouns, adjectives and adpositions (pre- and postpositions) also select participant roles. For ease of exposition, we will focus on verbs, although many statements also hold for other role-selecting categories.

The following overview of the most widely used participant roles and of the notions characterizing them serves as an introduction to the next sections of this chapter. Agent is the role of the participant that initiates and executes, possibly deliberately, the eventuality denoted by the verb, such as in John is working and John baked a cake. Related to the agent is instrument, which is also a causal factor in the eventuality denoted by the verb, such as the key in the key opened the door. Patient is the role of the participant that is causally affected, moved or otherwise changed in the eventuality denoted by the verb. The objects of the verbs bake and open in the examples above bear this role. So far, notions related to causation, intentionality (or control of action), execution of the eventuality described by the verb, on the one side, and causal affectedness and change, including locational or existential change, on the other side, have been used to characterize participant roles.

Other pertinent general notions that help us to identify participant roles are mental states, which are often used under the cover term sentience. They characterize the experiencer, which is the role of the participant that has the mental state denoted by the verb, such as John in John knows the answer. Mental states also characterize roles such as the addressee for verbs of communication in the broad sense, including tell John a story, show John a picture.
and teach John English. With these verbs, the mental state of John, e.g. his knowledge or attentional focus, is changed in the eventuality described by the verb.

Possession is another general concept that is relevant for participant roles, including the possessor and the object of possession (possessum) as in John owns three cars and the recipient of verbs denoting transfer of possession, e.g. give John money.

The location, orientation and movement of participants in space is important for roles such as locative (e.g. lying on the floor), source, path and goal, e.g. driving from home (source) through the forest (path) to the railway station (locational goal). In many instances, locational notions co-occur with non-locational ones. Thus, for example, if Mary sold her car to the church is true, the car changes its possessor and location in the normal course of events. Space roles are intimately connected to time roles, e.g. driving from six in the morning (the temporal beginning) the whole day through (the temporal “path” or duration) to midnight (the temporal end).

Some participant roles are more difficult to pin down, since none of the general notions mentioned above seem to be applicable to them, e.g. the role of the subject in the stone is falling and of the object in know the answer. Therefore, most researchers include an under-specified role in their inventory such as theme (as opposed to patient, which is usually used for participants undergoing a change, as mentioned above).

As this role overview shows, a participant role is usually realized as a syntactic argument (i.e. subject or object) of a verb or of another role-selecting category. This chapter focuses on this type of realization for semantic roles. However, semantic roles, such as locative and time, for instance, may also be adverbial modifiers, such as in working in the garden at noon. In this case, they fall into an area of linguistic research specialized in adverbial modification.

Participant roles are involved in a multitude of grammatical phenomena. Besides, they also play a crucial role in language acquisition and in the way language is processed in the brain. Section 2 will present phenomena that form the main topics of research in role semantics. Whether these phenomena are adequately captured by a list of atomic participant roles or, alternatively, by some other role-related theoretical means will be discussed in section 3. The chapter ends with an overview of the latest developments and of future directions in role semantics (section 4).

2 Main topics

2.1 Lexical semantics and language acquisition

Participant roles are intimately connected to the meaning of argument-selecting words. This is most evident in language acquisition:

Thus, for example, when children learn the word give, there is really no learning of the word apart from the participant roles that invariably accompany acts of giving: the giver, the thing given, and the person given to; in fact, we cannot even conceive of an act of giving in the absence of these participant roles.

(Tomasello 2000: 134)

Well in advance of using verbs, infants show considerable insight into the general concepts that characterize participant roles, including change of location, movement, causation and the difference between accidental and intentional results of events (see Hirsch-Pasek and Golinkoff (2006); see also Chapter 26). Evolutionary psychologists (see Spelke and Kinzler
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(2007)) assume that both human neonates and non-human animals are endowed with evolutionarily ancient core knowledge about objects (e.g. cohesion, i.e. objects move as connected and bounded wholes) and agentivity (e.g. goal directedness). Such general concepts are needed to discern what is the basic distinction between a giver, i.e. the initiator and executor of the act of giving, and the thing given, i.e. the causally affected, passive entity. This knowledge helps children to learn novel verbs that exhibit an analogous distinction and to form more general role concepts such as agent and patient.

However, there is more to the meaning of a verb than the characterization of the types of participant roles it selects. Each verb includes additional, lexeme-specific role information. Thus, for example, there is more in the concept of a seller than the information that the seller is the agent of the event in question. Hence, a giver and a seller bear the same general agent role but different verb-specific roles.

These remarks lead us to the general problem of granularity in semantic-role research: some phenomena, including lexical semantics, need a fine-grained analysis of the individual roles a lexeme selects; yet other phenomena – notably the mapping of the multitude of lexeme-specific roles onto a small number of syntactic functions (i.e. subject and object) – are best explained by a small number of more abstract, generalized participant roles.

2.2 Mapping participant roles onto syntactic functions

Both within and across languages, there are principles guiding the mapping of participant roles onto syntactic functions such as subject and object. This kind of mapping is also named linking, alignment, argument realization or argument selection. It is the main area of application of role notions and the principal testing ground for semantic-role theories.

A basic assumption of several semantic-role theories is role uniqueness. This means that only one representative of a given participant role may appear in a sentence that denotes a simple event (e.g. Fillmore (1968); Carlson (1998)). Many researchers go one step further and hypothesize bi-uniqueness of mapping between syntactic arguments and participant roles, as stated in Chomsky’s Theta-Criterion (1981: 36):

(1) The Theta-Criterion: Each argument bears one and only one theta-role, and each theta-role is assigned to one and only one argument.

A similar principle is Function-Argument-Biuniqueness in Lexical Functional Grammar (Bresnan 2001).

The Theta-Criterion and similar principles are confronted with serious problems (for a critique, see e.g. Jackendoff (1990); Dowty (1991)). First, there are expletive arguments with no corresponding role, such as it in it rains. Second, some participant roles cannot be expressed syntactically, cf. particle verbs in German such as zuschlagen “beat, punch” and losschreiben “to start writing”: Peter schlug (*jemanden) zu “Peter punched somebody”; Peter schrieb (*etwas/*einen Brief) los “Peter started writing something/a letter”.

A third, more subtle problem is role accumulation, i.e. one syntactic argument bearing two roles in one event or subevent (see Jackendoff (1990)): in Mary sold her car to the church, Mary is the causer of the selling event and the initial possessor of the car. A possible solution is to assume that a participant may be involved in different relations, in this example causation and possession (see Dowty (1991) and section 3.3 below, Carlson (1998) and Koenig and Davis (2006) for other cases). Another solution is to dissociate two levels of role representation: a level where arguments may bear several thematic (or semantic) roles,
and a theta-structure, where these roles are bundled into a small set of theta-roles (see Carnie (2007: chapter 8.2), Wunderlich (1997) and section 3.2 below).

The fourth problem is role dispersion, i.e. two syntactic arguments bearing the same role. Symmetric predicates such as *Fred resembles Bob* are a case in point. *Fred resembles Bob* is truth-functionally equivalent to *Bob resembles Fred*, i.e. one cannot accept the truth of one sentence while denying that of the other. This does not hold for *Fred is slapping Bob* and *Bob is slapping Fred*. Fillmore (1970: 262), among others, proposes a solution to this problem in terms of reference-related notions: the argument in subject position must be a referring expression, the one in object position can have a non-referring (de dicto) reading, cf. the irreversibility of *Fred resembles a horse*.

This solution raises one of the biggest, still open questions in role semantics: What counts as a semantic-role notion? According to Dowty (1991: 562):

> no semantic distinction will count as relevant data for our theory of roles unless it can be shown to be relevant to argument selection somewhere in some language, no matter how traditional a role it characterizes; and any semantic distinction that can definitely be shown to be relevant to argument selection can count toward defining a role type, no matter whether it relates to a traditional role or not.

Surprisingly, in view of this statement, Dowty (1991) hesitates to include reference-related notions in his role entailments since they may be tied to subjechtwood in a direct way (see (22e) and (23e) in section 3 below). As to perspective-related roles such as figure and ground (see Talmy (2000: chapter 5)), he bans them from his inventory. However, they determine subject selection, as do the reference-related properties mentioned above. Thus, for example, a bicycle is smaller and normally more variable in its position than a house. So in the normal course of events, the former may act as a figure in relation to the latter, which is the perceptual ground, but not the other way round. In copular locative constructions in English and other languages, the figure is selected as subject, e.g. *The bicycle is near the house* vs. *The house is near the bicycle* (‘#’ stands henceforth for a semantic anomaly in the reading under discussion.)

The question of delimiting the range of semantic-role notions is tackled in two ways in pertinent research. One solution is to consider all semantic distinctions that are relevant to argument selection to be role notions, as stated by Dowty above and as pursued by Fillmore (1970) for *resemble* (see above). Another way is to allow argument realization to be determined by semantic information that is distinct from role semantics. This solution is favoured, for example, by Dowty (1991) for figure and ground and, tentatively, also for reference-related distinctions. How difficult the decision is can be shown for figure and ground. This distinction combines perspective and information-packaging notions (the figure is in the centre of attention) with role-related notions (the figure is more movable and the ground more stationary). So finding the divide between semantic-role notions and other types of concepts that determine argument realization is not a trivial enterprise.

General mapping principles such as the Theta-Criterion do not restrict the semantic-role content assigned to a particular type of syntactic function. Therefore, it has to be supplemented by principles that restrict the mapping between certain roles and certain syntactic functions. Among the multitude of proposals that have been put forward in the literature, the following (or a similar) principle for the basic transitive construction has gained wide acceptance (e.g. Dowty (1991: 576); Levin and Rappaport Hovav (2005: 24); Lasnik and Uriagereka (2005: 6) in different frameworks):
(2) Basic mapping of agent$^S$ and patient$^S$ in accusative languages:
If the verbal predicate selects an agent$^S$ and a patient$^S$, the agent$^S$ is mapped onto the subject and the patient$^S$ onto the direct object.

In (2), we have made some qualifications that are adopted implicitly or explicitly in many publications. First, the principle makes the best prediction for strongly specified agents and patients as used in the standard definition given in section 1 above (abbreviated as agent$^S$ and patient$^S$). Recall that the agent – now marked agent$^S$ – was defined as the role of the participant that initiates and executes, possibly deliberately, the eventuality denoted by the verb. Patient$^S$ is the role of the participant that is causally affected, that is moved or otherwise changed.

Second, the mapping of agent$^S$ and patient$^S$ has to accommodate the distinction between accusative and ergative languages, which is the centrepiece of alignment typology. This typological parameter separates accusative languages, where (2) holds for syntactic functions interpreted as structural positions and morphosyntactic cases (e.g. English, German, French, Japanese and Korean) from ergative languages (e.g. Basque, Avar, Hindi and Dyirbal), that exhibit a different basic mapping, at least in terms of morphosyntactic cases. In the ergative construction, the patient$^S$ is in the absolutive, the morphosyntactic case that corresponds to the nominative, while the agent$^S$ is in the ergative, a case that is formally more marked than the absolutive (see e.g. Dixon (1994); Primus (1999) for an overview). Besides ergative mapping, there are several other alignment types (see e.g. Bickel (2011)). In this chapter, we will focus on the better-known accusative languages.

Third, the principle (2) only holds for the basic transitive construction of accusative languages, which is illustrated by an English example in (3a):

Example (3b) shows that an inverse basic transitive construction in which the patient$^S$ is linked to the subject and the agent$^S$ to the direct object is ungrammatical in accusative languages. The patient$^S$ may surface as the subject of semantically poly-valenced verbs only if the agent$^S$ is barred from becoming a subject, for instance, by the passive morphology of the verb, as shown in (3c).

Pairs of verbs like borrow–lend, buy–sell and get–give pose a problem for bi-uniqueness of mapping (see (1) above) as well as for the basic mapping principle (2). Cf. (4a, b):

The mapping problem is that such verbs imply both a transfer and a counter-transfer of possession, an obtaining and a giving event with their own agent and recipient. The problem for the mapping principle (2) is that one needs a criterion to decide which of the agents (the taker or the giver) becomes the subject. One solution to this problem is to assume that argument mapping is not solely determined by role semantics but also by perspective- or salience-related notions (see Fillmore (1970); Koenig and Davis (2006)). The verbs borrow, buy and get highlight the obtaining relation, i.e. they lexicalize the transfer of possession from the perspective of the obtainer of goods. The verbs lend, sell and give emphasize the
giving relation. Another solution is to claim that the verb pairs under discussion have different semantic representations (see Jackendoff (1990)). This solution is corroborated by the fact that although some situation tokens involving these pairs of verbs are truth-functionally equivalent, i.e. mutually entail each other, this does not hold for all situations. Cf. (5a, b):

\begin{align*}
(5) & \ a \quad \text{Jill readily borrowed a pen from Sandy.} \\
    & \ b \quad \text{Sandy readily lent a pen to Jill.}
\end{align*}

Alternatively, the proponents of the perspective-based solution have to acknowledge that perspectivization may have truth-functional effects.

In sum, despite the fact that they have to be parameterized and further specified in different ways, mapping principles, including the mapping principle for the basic transitive construction presented in this section, are strong evidence for the viability of role notions that are more abstract than verb-specific roles. They also have a bearing on language acquisition and language parsing. Young children are more successful in the acquisition of basic (also: canonical) mapping and show a strong tendency to overgeneralize it (e.g. Chan et al. (2009)). Many psycholinguistic experiments also reveal that basic mapping is preferred in language parsing (see Bornkessel-Schlesewsky and Schlesewsky (2009: chapter 9)). Despite the appeal of the basic mapping principle, we have to bear in mind that its scope is very limited typologically and semantically. If one takes other alignment types (e.g. ergative languages), roles, semantic factors or syntactic functions into consideration, the picture becomes more diffuse. One challenging case has been illustrated above by borrow and lend; other cases will be discussed in the context of mapping alternations in the next section.

2.3 Mapping alternations

Mapping alternations, i.e. different argument realizations for one verb, are a tantalizing problem for role semantics. For English, Levin (1993) distinguishes almost 60 verb classes, most of them with a number of subclasses, that show distinct syntactic behaviour (see also Riemer (2010: 352–359) for an overview). The different syntactic realizations are determined by fine-grained role differences that interact with other semantic or pragmatic phenomena tied to animacy, aspect, definiteness, givenness and perspectivization (e.g. figure and ground). Additional challenges arise from performance-based factors such as constituent weight and a strong frequency bias in favour of one variant. A well-studied alternation that has been considered to be determined by several interacting factors is the dative alternation in English.

The dative alternation concerns the following syntactic patterns, called the Direct Object (DO)-construction and the Prepositional Object (PO)-construction. Cf. the examples and the rudimentary argument structures in (6a, b):

\begin{align*}
(6) & \ a \quad \text{Ann gave Beth the car.} \quad x \text{ gave } y \ z \quad \text{DO-construction} \\
    & \ b \quad \text{Ann gave the car to Beth.} \quad x \text{ gave } z \text{ to } y \quad \text{PO-construction}
\end{align*}

Many authors assume that the different syntactic patterns can be explained by the following semantic difference between them (e.g. Krifka (2004); see Bresnan and Nikitina (2003) for further references): the DO-construction entails that y is the possessor of z after the event denoted by the verb, whereas the PO-frame implies that z is at some local region of y after the event denoted by the verb. (Henceforth, this assumption will be referred to as the
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(7) a Beth sent a package to London.
   b *Beth sent London a package.

(8) a Ann lowered the parcel to Beth.
   b *Ann lowered Beth the parcel.

(9) a Ann threw the ball halfway to Beth.
   b *Ann threw Beth the ball halfway.

Krifka explains the asymmetries in (7)–(9) as follows: (7b) is semantically anomalous in the literal reading of London since the participant y must satisfy the selectional restrictions for possession in the DO-construction: if Beth sent a package to London, we cannot say that London possesses the package, except if London is a metonym for an organization, like Scotland Yard. In the PO-construction, the participant z must undergo movement, while movement is assumed to be lacking in the pure change-of-possession reading of the DO-construction. The DO-construction in (8b) is odd because verbs such as lower, haul, push and pull denote a continuous imparting of force of the agent upon the patient all the way along a path. This means that motion and change of possession are homomorphic. Since the DO-construction involves no movement event according to the view under discussion, it is odd with these verbs. This is also the explanation offered by Krifka for the fact that the adverb halfway, which modifies a path, is semantically uninterpretable in the DO-construction (9b).

A problem for the possessor-locative assumption arises when it is extended to verbs of communication, cf. (10a, b):

(10) a Ann showed the car to Beth.
    b Ann showed Beth the car.

According to Krifka (2004: 3), “[v]erbs like show, read, tell, quote do not express transfer of possession in the literal sense, but they do indicate that the recipient gets hold of some information”. The problem is that the notion of possession is metaphorically extended and thereby diluted to include the addressee of verbs of communication (see Chapter 15).

Even more intriguing is the notion of possession for the role of the DO in idiomatic uses such as illustrated in (11) and (12):

(11) a The explosion gave Beth a headache.
    b *The explosion gave a headache to Beth.

(12) a His behaviour gave Beth an idea.
    b *His behaviour gave an idea to Beth.

Krifka (2004), among others, explains the oddity of the PO-construction in (11b) and (12b) by the fact that ideas and headaches cannot move literally. However, the possessive analysis of the DO-construction is as strained as the locative reading of the PO-construction for such idiomatic uses, since ideas and headaches cannot be a possessum if one takes possession literally.

Another problem is that metaphorical meaning extension is also used to explain why all verbs of transfer of possession (with the morpho-phonologically motivated exception of latinate verbs such as donate) allow for the PO-frame with no truth-conditional difference. According to Krifka (2004: 11), among others:
the reason for this is that every transfer of possession can be conceptualized as an abstract movement event in the dimension of possession spaces: When Ann gives Beth a car, then the car is moved from the possession of Ann into the possession of Beth.

Under closer scrutiny, one is not obliged to resort to “possession spaces” to explain that many verbs occur in both constructions. As mentioned in section 1 above, verbs of transfer of possession often imply two simultaneous events, a change of possession and a change of location. The DO-construction highlights the change of possession, the PO-construction the locational change (see Koenig and Davis (2006) where verbs are represented by a set of elementary predicates, one of them being highlighted as the KEY). A change of possession is conceptualized as instantaneous, so the DO-construction is odd when a path is presupposed (see Jackendoff (1990)). This nicely explains the oddity of halfway in (9b).

A general problem for Krifka’s semantic distinction between the possessive and the locative reading and his strict mapping assumption is that they only hold as a tendency. In their corpus-based analysis, Bresnan and Nikitina (2003) showed that the examples assumed to be ungrammatical in the pertinent literature do occur, though admittedly only in the much larger corpus of web documents. They appear not to be grammatically impossible, but just improbable. Here we only show two counterexamples to Krifka’s assumptions. Cf. (13) and (14):

(13) As Player A pushed him the chips, all hell broke loose at the table. www.cardplayer.com/?sec=afeature&art id=165 (from Bresnan and Nikitina (2003: 6))

(14) She found it hard to look at the Sage’s form for long. The spells that protected her identity also gave a headache to anyone trying to determine even her size, the constant bulging and rippling of her form gave Sarah vertigo. http://lair.echidnoyle.org/rpg/log/27.html (from Bresnan and Nikitina (2003: 9))

(13) challenges the assumption that verbs like lower and push, which denote a continuous imparting of force of the agent upon the patient, cannot be used in the DO-construction (see (8b) above)). (14) casts a doubt on the claims that the PO-construction is ungrammatical for idiomatic uses of give and that the anomaly arises from the fact that headaches cannot move literally (see (11b) and (12b) above)).

As Bresnan and Nikitina, among others, show, the dative alternation in English is determined by several soft constraints that may compete with each other. One constraint is to avoid overt (i.e. PO) marking for recipient-possessors. This is proposed as a hard constraint by the proponents of the possessor-locative-assumption, who additionally assume that PO-marking is obligatory for locative goals. Bresnan and Nikitina’s soft constraint against overt marking of recipient-possessors is able to explain the strong statistical bias in favour of the DO-construction for verbs of change of possession (87% DO vs. 13% PO for give, see Bresnan and Nikitina (2003: 13)) as well as the fact that such verbs occur in both constructions with no palpable semantic-role difference.

If the DO-construction is basic (the default) for give, then the preference asymmetry shown in (11) and (12) above for idiomatic uses can be explained without resorting to the questionable assumption that give somebody an idea and give somebody a headache have a possessive reading. It would suffice to claim that the default construction, the DO-construction in this case, is used if a verb, e.g. give, is used idiomatically.

Another soft constraint used by Bresnan and Nikitina is to place shorter constituents before longer ones. This is a solution to (14), where to anyone is supplemented by a gerundive modifier. In addition, information packaging, reference-related notions, and animacy
also play a role in this framework. When both are objects, the recipient, i.e. ultimate possessor, tends to dominate the possessum on hierarchies of informational prominence (given > accessible > new), definiteness (definite > indefinite) and animacy (animate > inanimate). The animacy, givenness and lightness of *him* in (13) is a plausible explanation for its use in DO-position.

A multi-dimensional approach to the dative alternation in English captures the data more appropriately than one-dimensional semantic-role assumptions (see Levin (1993); Aissen (2003); Levin and Rappaport Hovav (2005) for other mapping alternations). The appeal of a multi-dimensional approach sheds light on the general issue of mapping participant roles onto syntactic functions. Role-based mapping principles including the principle for the basic transitive construction (see (2) above) can be overridden in many cases by various grammatical factors and in some cases also by performance constraints. If one takes a typologically broader vista, additional factors that determine not only non-basic constructions but also the basic transitive construction come into play. These include clause type (subordinate vs. main clause), polarity (negative vs. affirmative) as well as verbal time, aspect and mood (see Dixon (1994) for ergative-accusative mapping alternations).

Let us sum up and compare the possessor-locative-assumption as an example of a strict role-based analysis with a multi-dimensional approach to mapping alternations from a broader perspective. When the same verb appears in two (or more) constructions, proponents of strict role-based assumptions claim that the role-related meaning of the constructions differs. Either the verbs are lexically polysemous, or polysemy is imposed by the differing constructional contexts they appear in, depending on the specific grammatical frameworks (lexical or constructional; see Chapter 13). In a multi-dimensional view, by contrast, the two constructions differ in use but not necessarily in their role-related meaning. This view presupposes that the selection of syntactic constructions is determined by several factors, one of them, undoubtedly an important one, being role semantics.

This leads us back to the fundamental question of what counts as a semantic-role notion. As evident from our brief survey of argument realization in the last two sections, argument selection in both basic and non-basic constructions is determined by a wide range of factors that cannot be subsumed under semantic roles without diluting their content and thereby dramatically weakening their explanatory value. This casts a serious doubt on the viability of Dowty’s (1991: 562) above-quoted assumption that any semantic distinction that can be shown to be relevant to argument selection can count toward defining a role type.

### 3 Theoretical approaches

In section 2 we presented main topics and fundamental questions in role semantics. This section offers an overview of the most influential theoretical solutions to these issues. Theoretical approaches to participant roles can be broadly classified into two types. In one type of framework (see section 3.1 below), roles are basic, unanalyzable entities that are listed in the lexical representation of a predicate (role-list approaches, following Levin and Rappaport Hovav (2005)). In the other view, roles are derived from basic notions such as causation, change, motion or sentience by different means (see sections 3.2–3.3 below).

#### 3.1 Role lists

Fillmore’s Case Grammar (1968: 24–25) uses a list of roles that are characterized by more basic terms such as volitional instigation (agent), causal involvement (instrument),
affectedness (dative) and existential change (factitive). However, these basic notions do not play a role in his theory. Instead, the lexical entries of verbs and the subject selection principle proposed by him resort to roles taken as atoms. The lexical entries of the verbs open, show and give are illustrated in (15). Parentheses indicate optional roles (1968: 27, 35):

(15)  

<table>
<thead>
<tr>
<th>Verb</th>
<th>Role Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>open</td>
<td>[__ objective (instrumental) (agentive)]</td>
</tr>
<tr>
<td>show, give</td>
<td>[__ objective + dative + agentive]</td>
</tr>
</tbody>
</table>

His list of six deep cases, which also includes objective as an underspecified role and locative, is considered preliminary, but Fillmore is confident that they form a small set (1968: 5). A small inventory of roles is needed to guarantee that participant roles are mapped onto a small number of syntactic functions in a uniform way. The following rule captures the unmarked subject choice (1968: 35):

(16)  

- If there is an agentive, it becomes the subject (see (18a, b));  
- otherwise, if there is an instrumental, it becomes the subject (see (18c));  
- otherwise, the subject is the objective (see (18d)).

The role hierarchy that motivates Fillmore's subject selection rule is (17):

(17)  

agent > instrumental > objective

In accordance with the subject selection rule, the verb open can be used in the following surface structures:

(18)  

a John opened the door with a key.
b John opened the door.
c The key opened the door.
d The door opened.

Fillmore's main assumptions characterize many subsequent role-list approaches even if they use different roles and different hierarchies.

Neo-Davidsonian approaches following Parsons (1995) also use role lists. The representation in (19) is meant to capture the fact that a sentence like Brutus stabbed Caesar in the agora entails the following: There was a stabbing; The stabbing was by Brutus; The stabbing was of Caesar; The stabbing was in the agora (see Parsons (1995: 636)):

(19)  

(∃e)[Stabbing(e) & Agent(e, Brutus) & Theme(e, Caesar) & InLocation(e, the agora)]

As Parsons admits (1995: 639–640), his treatment does not offer any substantive information on semantic roles and argument realization. Nevertheless, Neo-Davidsonian representations are still used (e.g. Krifka (2004)).

Role lists are a convenient tool for preliminary role analyses and mapping hypotheses. However, they have serious weaknesses (see Levin and Rappaport Hovav (2005); Primus (2009) for a critical survey). First, the number of individual roles exceeds by far the number of core syntactic functions. As soon as one takes other roles than agent5 and patient5 into consideration, the number of alternative roles for one syntactic function expands considerably. Role-list approaches are forced to claim that many alternative roles, e.g. agent and  

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instrument, as shown in (18b, c), belong together in some way that is left unexplained. This shortcoming and the necessity to keep the number of roles as small as possible lead to a serious problem when roles have to be split up into similar yet distinct specimens. Let us show this briefly for instruments, which are more varied than traditionally assumed (see Schlesinger (1989); Kamp and Rossdeutscher (1994); Koenig et al. (2008)). Cf. (20):

(20)  
\begin{align*}
  a & \quad \text{John cleaned the dishes with the dishwasher/soap/rag.} \\
  b & \quad \text{The dishwasher/soap/rag cleaned the dishes.}
\end{align*}

To capture the asymmetries in (20b), one has to differentiate between agent-causers which, once the agent has applied them, can be conceived of as acting on their own, and pure instruments, which lack this capacity. The first interpretation is most easily obtainable for machines like dishwashers, more difficult for cleaning “agents” such as soaps and hardly possible for rags. This cline matches the ease of becoming the subject in (20b), as suggested by the increasing number of anomaly marks. Note that Fillmore’s example (18c) implies that the key has some property that is the crucial causal factor for the opening of the door.

A second problem for role-list approaches is that the roles are not hierarchically organized in the lexical entry of role-selecting words. As a consequence of this, argument selection has to resort to role hierarchization by additional means (hierarchies or role embedding, see Grimshaw (1990)). A third problem is that (typically but not necessarily) proponents of the list view adhere to bi-uniqueness of mapping between syntactic functions and roles. As shown above for verbs such as sell and give, many problems for bi-uniqueness can be solved if one admits that verbs entail several elementary predicates (or events) with their own roles. Unfortunately, most role-list approaches only take one event into consideration.

3.2 Structured lexical decomposition

An alternative approach that copes with some of the problems of role-listing is to derive and thereby eliminate participant roles by postulating a decompositional structure for verb meanings (see for a more extensive discussion Levin and Rappaport Hovav (2005: 68f.); Engelberg (2011)). Decompositional structures have been developed in Generative Semantics, where they were posited at syntactic deep structure. Later theories employed them as representations on a lexical-semantic level (e.g. Dowty 1979) or on a conceptual level in Jackendoff’s Conceptual Semantics (see also Chapters 12 and 22). Parallel to these developments, syntactic approaches to structured decomposition emerged (see Hale and Keyser (1992); Harley (2012); Levin and Rappaport Hovav (2005: 131f.); Engelberg (2011: 385f.)). We will illustrate this kind of approach by Wunderlich’s (1997: 38, 44) treatment of ditransitive verbs such as give and show in (21):

(21)  
\begin{align*}
  a & \quad \lambda z \lambda y \lambda x [\text{cause} (x, \text{become} (\text{poss}(y, z)))] \\
  b & \quad \lambda z \lambda y \lambda x [\text{cause} (x, (\text{see} (y, z)))]
\end{align*}

Wunderlich splits the lexical representation of a predicate into two levels. The first level is theta-structure; it contains the lambda-bound variables which are associated with theta-roles (lambda operators are a formal means to represent the free arguments of a predicate). The second, more elaborate level (in square brackets in (21) for convenience) contains semantic roles and their characterization in terms of primitive predicates such as cause, become (for
change) and poss (for possession). The relative embedding of the argument variables in the semantic form is mapped onto theta-structure. Leaving details aside, the relative rank of the argument variables determines linking to syntactic functions: the role that is highest (i.e. has lower but no higher co-arguments) is mapped onto the subject, the role that is lowest (i.e. has higher but no lower co-arguments) is linked to the second object position, and the role that has both lower and higher co-arguments is mapped onto the first object position. This mapping device captures the DO-construction discussed in section 2.3 above (see for a more detailed discussion Primus (2009); Engelberg (2011)).

Wunderlich’s structure-based linking principles correctly predict the basic patterns for accusative languages. Mappings that do not conform to structure-determined principles are assumed to be lexical, i.e. idiosyncratic cases. Traditional roles such as agent, patient, recipient (for give) and addressee (for show) and a role hierarchy are not needed in this kind of approach. The fact that both verbs of communication and verbs of transfer of possession favour the DO-construction (see section 2.3 above) is explicable as follows: a recipient and an addressee share the same structural position in the lexical representation of the respective verb type. In contrast, approaches using role lists (e.g. Krifka (2004)) cannot offer a common denominator for these roles. Despite their merits, decompositional approaches that use only one event structure cannot capture the fact that some verbs, including those denoting a transfer of possession, incorporate more than one event in their meaning and a wider array of basic predicates besides cause, become and poss (see section 2.3 above).

### 3.3 Proto-roles

Another view that eliminates some of the weaknesses of role-listing is to derive the traditional roles from basic notions such as causation, sentience and change and to cluster these notions into a few superordinate (i.e. generalized) roles. The basic notions are treated as entailments (e.g. (Dowty 1991); Ackerman and Moore (2001)), as role features (e.g. Reinhart (2002); Haiden (2012)) or as a set of elementary, possibly internally structured predicates that are entailed by verb meanings (Primus (1999); Koenig and Davis (2006)). A related proposal that combines structured lexical decompositions with generalized roles is Role and Reference Grammar (see Van Valin and LaPolla (1997)). Here we will discuss Dowty’s influential work (1991). Dowty defines two superordinate proto-roles by bundles of entailments generated by the verb’s meaning with respect to one of its arguments. The agent proto-role is characterized as follows (1991: 571):

(22) Agent proto-role:

a. x does a volitional act: John refrains from smoking.
b. x is sentient of or perceives another participant: John knows/sees/fears Mary.
c. x causes an event or change of state in another participant: His loneliness causes his unhappiness.
d. x is moving: Water filled the boat.
[e. x exists independently of the event named by the predicate: John needs a car.]

Although most verbs select more than one proto-agent property for their subject argument (e.g. murder, nominate and give), each of these properties can occur in isolation as shown by the subject argument in the examples in (22a)–(22e). The patient proto-role is defined and illustrated by the object argument of the examples in (23):
Participant roles

(23) Patient proto-role (Dowty 1991: 572):
   a. x undergoes a change of state: *John moved the rock*.
   b. x is an incremental theme: *John filled the glass with water* (also stationary relative to other participants).
   c. x is causally affected by another participant: *Smoking causes cancer*.
   d. x is stationary relative to another participant: *The bullet entered the target*.
   e. x does not exist independently of the event, or not at all: *John needs a car/seeks a unicorn*.

Incremental theme is introduced for a participant whose degree of affectedness parallels the degree of completeness of the event, e.g. *read a book* and *memorize a poem*. The other basic notions mentioned in (22) and (23) are straightforward. Reference-related properties including the referential reading of the subject and the non-referential reading of the object in *John needs a car* and *John seeks a unicorn* are tentatively included by Dowty, as suggested by the brackets (see also section 2.2 above). The list in (22) and (23) is preliminary for Dowty. Properties have been deleted or added in subsequent research without changing the logic of his approach (see telic entity as a new property in Ackerman and Moore (2001) and possession in Primus (1999)).

The specific roles of role-list approaches can be defined in terms of proto-role entailments: agents by volition and possibly more proto-agent properties; instruments and causers by causation without volition; experiencers by sentience without other properties. But proto-role approaches are also able to subsume a high number of specific roles under a small set of general roles.

Syntactic argument selection is assumed to be sensitive to the higher or lower number of entailments accumulated by an argument (Dowty 1991: 576):

(24) In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of proto-agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of proto-patient entailments will be lexicalized as the direct object.

The principle is meant to capture lexical default mappings for arguments with a high number of consistent properties such as those selected by the verbs *break* and *hit*. Underspecified roles that accumulate a low number of consistent proto-role properties or none at all may have a variable realization. If two arguments accumulate the same number of proto-agent properties, either of them may be selected as a subject. This explains the reversibility of symmetric predicates such as *Fred resembles Bill/Bill resembles Fred*, if information packaging, reference-related properties and perspectivization do not interfere (see section 2.2 above). Both role dispersion as in this case as well as role accumulation can be handled straightforwardly. If one includes possession, recipient and similar roles can be treated uniformly since roles that combine proto-agent and proto-patient entailment pose no problem. Recipients are causally affected possessors, addressees are causally affected sentient roles (cf. the derived concept of Proto-Recipient in Primus (1999)). This explains why Proto-Recipients are mapped onto the same syntactic function in many languages: the first object in the DO-construction as a default, the oblique object in the PO-construction as a marked option in English (cf. section 2.3 above) and the dative object in German and other languages with dative case.

Despite its merits, the predictions of Dowty’s argument selection principle are limited to transitive predicates with grammatical subject and object in accusative languages and to
predicates with a high number of consistent proto-role entailments. The limitation to syntactically transitive predicates is unwarranted (cf. Primus (1999); Ackerman and Moore (2001) for an extension to intransitive predicates). Another shortcoming is that Dowty offers no principled explanation for the semantic coherence of a proto-role and no principled way of capturing structure-based meaning components that lie in the focus of approaches using decompositional structures (see above). To remedy these problems, subsequent approaches incorporate the proto-role defining properties into predicate structures (see Primus (1999); Koenig and Davis (2006)).

4 Future directions

As discussed in the previous sections, semantic-role notions play an important part in grammar, language acquisition and language processing. Arguably, notions related to agentivity and objecthood belong to evolutionarily ancient core knowledge of our species. Starting with a small list of participant roles in the late 1960s, modern linguistics has rapidly gained many new insights pertaining to participant roles. New impulses and future directions of research emerge from developmental studies, neurolinguistics, corpus-linguistics and linguistic typology, each of these fields producing a considerable amount of qualitatively new data.

As a reaction, there is an ongoing trend to depart from simple role-listing. Instead, as shown in sections 3.2 and 3.3 above, new approaches use basic notions such as causation, change, sentience or possession in decompositional structures or in the definition of superordinate roles. Some approaches introduce two levels of role representation (see the distinction between thematic or semantic roles and theta-roles in Carnie (2007: chapter 8.2) and Wunderlich (1997) and the distinction between macro- and microroles in Van Valin and LaPolla (1997)). Using concepts such as causation, change, sentience or possession has shifted the burden of future work toward explaining these intriguingly elusive notions: are they cognitive primitives or derived cluster categories? (See e.g. Haiden (2012) for causation and volition as cluster concepts.) The departure from simple role-listing will also lead to a proliferation of more fine-grained role notions (e.g. Koenig et al. (2008) for several role notions that substitute the traditional instrument role).

Recent research has shown that role notions interact with a wide array of other semantic or pragmatic concepts in determining mapping alternations and basic mapping if one takes other roles than strongly specified agents and patients and a typologically broader data base into consideration. As a consequence of these findings and of the above-mentioned proliferation of more fine-grained role notions, an open question of increasing importance is what counts as a semantic-role notion.

An issue that has received comparatively little attention in previous research is the context-dependence of role assignment and argument realization. So another issue for future research is how verb meaning, inter- or intrasential contextual information and world knowledge interact in role assignment and argument mapping (e.g. Klein (2012) for the influence of world knowledge on argument realization).

Further reading

Participant roles


References

Beatrice Primus


Related topics

Chapter 12, Lexical decomposition; Chapter 22, Event semantics; Chapter 24, Compositionality; Chapter 26, Acquisition of meaning.