

“A comparison of ‘thematic role’ theories”

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Abbreviations

A	agentive (deep case)	LDG	Lexical Decomposition Grammar
acc	Accusative	LFG	Lexical-Functional Grammar
ADOC	Alternation with double object constructions	LMT	Lexical Mapping Theory
ag	Agent	MIN	Minimalism
arg	Argument	nom	Nominative
ASP	Argument selection principle	NP	Noun phrase
ASP	Aspects-theory	O	Objective (deep case)
AUH	Actor-Undergoer Hierarchy	OBJ	Object
BEC	BECOME	OBL	Oblique
CG	Cognitive Grammar	OT	Optimality Theory
ConG	Construction Grammar	P-A	Proto-agent
CP	Complementizer phrase	pat	patient
CS	Conceptual structure	PP	Prepositional phrase
D	Dative (deep case)	P-P	Proto-patient
dat	Dative	P-R	Proto-recipient
DU	Deep unaccusativity	P&P	Principles and Parameters theory
e	(Sub-)event	PRED/pred	Predicate
exp	Experiencer	PSA	Privileged syntactic argument
F	Factitive (deep case)	rec	Recipient
go	Goal	RG	Relational Grammar
HPSG	Head-Driven Phrase Structure Grammar	RRG	Role and Reference Grammar
hr	Higher role	RUTAH	Relativized →UTAH
I	Instrumental	S	Sentence
IP	Inflectional phrase	stim	Stimulus

SU	Surface unaccusativity	UAH	Universal Alignment Hypothesis
SUBJ	Subject	UTAH	Uniformity of Theta Assignment Hypothesis
th	Theme	VP	Verbal phrase
TH	Thematic Hierarchy	XP, YP, ZP	Phrase type of any kind
THC	Thematic Hierarchy Condition		

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1. Introduction: motive, goals, structure

This work is crucially based on the idea that regularities of syntactic structure¹ are semantically motivated. It is thus a departure from the main ideas of Noam Chomsky's (1957) *Syntactic Structures* in which form has been declared independent of meaning and therefore was considered autonomous. Nevertheless, this separation of syntactic from semantic structure which the Chomskyan scientific revolution has brought about is a necessary precondition for this work and the research that has led to it. It presupposes the insight that syntactic constructions² can be described independently from other representations of a grammar. On the other hand the idea is rejected that syntactic constructions can be explained without reference to semantics or discourse-pragmatics.

The main topic of this work is to regard the relationship between form and meaning on the sentential level, i.e. between syntax and semantics. More specifically, it deals with the explanation of this relationship. One notion that has become central with respect to this attempt is that of “thematic roles”³. Since the invention⁴ of those numerous theories involving this notion have been developed and today there is such a huge amount of literature on the topic, that a rather concise work with so little time for preparation like this can hardly cope with it. It cannot do justice to all of the theories.

With these restrictions in mind the goals of this work can be formulated. The most original and most influential theories of thematic roles will be presented and discussed. Since the research on thematic roles started well back in the 1960s, the historical developments will be taken into account as well as the breadth of theories in the present. The original theory of Chomsky has been developed further in different directions; others have distanced themselves from the Chomskyan theories, so that there is a plurality of accounts. Most of these are embedded in larger theories of grammar. But there are also thematic role theories which have been developed independently of theories of grammar. These will also be discussed.

The discussion of the theories is thought to be an examination of their explanatory potential. This will be measured with regard to several language phenomena taken from English and German. (It is a trivial fact that giving an explanation for language data is the purpose of every theory of thematic roles.)

One difficulty in presenting the theories is the terminology that is used. It is unavoidable that while discussing a particular theory its own terminology must be used. In any case unclarity should be avoided. In passages that are neutral with respect to any theory the use of linguistic terminology will be clarified. In addition, there is a glossary consisting of the most

important terms that are used throughout the discussion. The terms in the glossary will be marked with “*” in the text and in the list of abbreviations.

The work is structured as follows: In the next chapter (ch. 2) I will present some theoretical questions concerning thematic roles including a sketch of the historical developments that have led to their invention and institution. In general, this chapter serves to answer the following questions in order to guarantee maximal clarity in the subsequent chapters:

- i) What are thematic roles?
- ii) What are theories of thematic roles good for?
- iii) Which are the roles?
- iv) What conceptions of thematic roles do exist?

In connection with question i) a definition of “thematic role” will be supplied as a kind of working hypothesis. In addition, some historical developments will be sketched.

Chapter 3 is rather empirical. Here, some language data is presented. These will be argument alternations posing (*idealiter*) increasing difficulties for the theories. The argument alternation phenomena are the following:

- 1) split intransitivity*
- 2) passive/passivization
- 3) locative alternation⁵
- 4) alternations with double object constructions*
- 5) psychological verbs

During the ongoing presentation some recurring questions and problems concerning thematic roles will be discussed. These include:

- a) the nature of agentivity,
- b) the relationship between agents and instruments,
- c) the relationship between goals and recipients,
- d) the relationship between goals and themes,
- e) the relationship between experiencers and locations,
- f) etc.

After having presented the language phenomena and the possible problems they pose for thematic role theories the theories themselves will be presented and discussed in chapter 4. It deals with different (historical and developmental) stages of thematic role theories on the one hand and different theories of grammar they are included in on the other. Therefore, this chapter is subdivided in accordance with the historical stages as well as with the synchronic breadth of the theories. The first (of five) subparts of this chapter is concerned with how “discrete”* thematic role theories deal with (at least part of) the data presented in chapter 3. These theories are the following:

ASP*/P&P/ *MIN*⁶	Case Grammar*	Relational Grammar*	Cognitive Grammar*	HPSG*⁷	LFG*⁸
Gruber (1965)	Fillmore (1968)	Perlmutter (1978, 1983)	Croft (1991)	Pollard (1987, 1994)	early LFG (Bresnan 1982)
Chomsky (1981)	Fillmore (1977)	Rosen (1984)	DeLancey (2000)	Heinz/Mati- asek (1994)	
Williams (1981a)				Wechsler (1995)	
Marantz (1984)					
Culicover/ Wilkins (1986)					
Hale/Keyser (2002, 2007)					

Table 1.1: “Discrete” thematic role theories to be discussed

The results of the discussion will then be summarized. After that thematic role “hierarchy”* solutions will be presented as the next subpart of the chapter. They have developed from discrete role theories because they promised to give more accurate explanations for the phenomena. The following thematic role hierarchy theories will be discussed:

Jackendoff⁹	Construction Grammar*	LFG-LMT*¹⁰	P&P/MIN	OT*¹¹
(1972, 1987, 1990, 1993, 2002)	Fillmore (1977)	Bresnan/Kane-rva (1989)	Larson (1988)	Aissen (1999)
	Goldberg (1995)	Bresnan/Zaen-en (1990)	Belletti/Rizzi (1988)	Primus (2002)
			Grimshaw (1990)	
			Hale/Keyser (2002)	

Table 1.2: *Thematic role “hierarchy” theories to be discussed*

The results of this discussion will also be summarized. As will be shown, several problems even with thematic hierarchies remain unsolved. As a consequence, “generalized” thematic roles have been developed in order to overcome these problems. The theories involving generalized roles will be presented in the third subpart of the chapter. They are:

RRG's*¹² macroroles and related theories	Dowty's proto-roles and successors	Primus'¹³ proto-roles
Foley/van Valin (1984)	Dowty (1989, 1991)	(1999, 2002, 2006)
van Valin (all)	Baker (1997)	
Kibrik (1997)	Ackerman/Moore (1998, 2001)	

Table 1.3: *“Generalized” thematic role theories to be discussed*

The generalized thematic role theories will also be summarized and discussed. One last alternative account will be presented that relies on the assumption that the notion of thematic roles deserves no independent status in a theory of grammar. Instead they are decomposed in terms of features. Therefore this sort of theories will be presented under the designation of “feature decomposition”* theories (of thematic roles). The one discussed in this work is the following:

Wunderlich's LDG*¹⁴
(2000 and subsequent)

Table 1.4: “*Feature decomposition*” theory (of thematic roles) to be discussed

One question remains to be answered, then: Can generalized roles or, as an alternative, feature decomposition theories solve all the problems of discrete role theories and thematic role hierarchies? This question shall be answered in the context of the discussions and in the grand summary in which the explanatory potential of the presented theories will be under discussion. A judgement whether the notion of thematic roles has a future or should be dismissed from linking theories will close chapter 4.

Regardless whether the answer to this last question turns out positively or negatively, some ideas of a new approach shall be sketched out in which neither discrete roles nor hierarchies, nor generalized roles, nor feature decomposition play a role. This will be the subject of chapter 5.

It must again be noticed that this work cannot take into account all the theories and proposals that would have deserved to be mentioned. And it must be emphasized that it is strongly intended to do justice to all the theories included in it.

2. Some history, general questions, and phenomena

This chapter is introductory with respect to some theoretical questions. The first section is a historical survey of the developments that have led to the invention of thematic roles. The second section deals with the status of thematic roles in theories of grammar. It supplies a definition of the notion of thematic roles and discusses the significance of the notion with respect to theories of grammar. It should be noticed that until the present day there is no agreement concerning a definition of “thematic role”. Therefore, there is only a working hypothesis supplied that is formulated as general as possible. It should fit all the different theories (to be presented in chapter 4). Incompatible positions are then part of the following chapters. The questions ((i)-(iv) raised in the preceding chapter are answered in the course of this chapter. The knowledge that is necessary to keep in mind for the understanding of chapters 3, 4 and 5 is supplied in this chapter.

2.1 Prerequisites for the “linking problem”: a brief historical sketch of form-meaning correspondence theories

Probably, the (pre-scientific) investigation of the structure and function of a language is as old as the language faculty itself. It relies on the insight that language is an abstract construction for which rules can be formulated that dominate it. The first attempt to write a grammar can be traced back to the 6th century BC. It is a grammar of Sanskrit by Pānini and is probably based on the works of grammarians who are even older than Pānini. (For the following cf. Butt (2002, appendix), (2005, ch. 2)). For our purposes it is at the same time the first noteworthy attempt to capture insights in language. It is closer to modern linguistics than the Greek and Roman linguistic and philosophical tradition. More specifically, Pānini was the first who explored the correspondence between some formal properties of his native language Sanskrit and semantic categories of thought. In his grammar consisting of 4,000 strictly ordered, interdependent rules he tried to explicate the relationship between semantic regularities and their morphosyntactic coding in terms of morphological case or case forms*. In order to capture and describe these correspondences via rules Pānini invented the so-called *Kāraka* theory*. This theory is part of the grammar and based on lexical semantics of verbs. It is a tool to classify the different participants of and in an event or action described by a verb

in terms of *Kāraka* roles. Every verb is a member in a particular verb class. These verb classes have particular features for determining the assignment of *Kāraka* roles to verbal arguments. In brief, then, there are morphological cases on the one hand and *Kāraka* roles on the other. They (and the rough equivalents to western terminology) are given below.

number	declination	western name
1	<i>devas</i>	nominative
2	<i>devam</i>	accusative
3	<i>devena</i>	instrumental
4	<i>devaya</i>	dative
5	<i>devat</i>	ablative
6	<i>devasya</i>	genitive
7	<i>deve</i>	locative

(Taken from Butt (2005, 16))

Table 2.1: *Pānini's morphological cases for Sanskrit*

<i>Kāraka</i> role	Pānini's definition	western thematic role
<i>apādāna</i>	the fixed point from which something recedes	ablative
<i>sampradāna</i>	the item in view through the <i>karman</i>	goal
<i>karana</i>	the most effective means	instrument
<i>adhikarana</i>	locus, location	locative
<i>karman</i>	the thing desired by the <i>kardr</i>	patient
<i>kardr</i>	the independent one	agent

(Taken from Butt (2005, 17))

Table 2.2: *Pānini's Karaka roles for Sanskrit*

How, then, are the *Kāraka* roles associated with the morphological cases of the arguments of the verb? In contrast to some modern theories (e.g. the UTAH*), there is no 1:1 mapping between the two notions. In Pānini's grammar, the association is rather via general rules that can be overridden in certain contexts by particular specific rules. This is a surprising result because it is an insight that is a more functional approach than some theories of the 20th century.¹⁵

The *Kāraka* theory cannot be discussed in greater detail but it should have become clear that it has to be mentioned as a precursor of modern theories of thematic roles. The similarities will re-appear up in the proceeding of this chapter. What distinguishes the Indian

grammarians from those of Greek and Roman tradition and what makes them resemble modern positions is the treatment of morphological case. Although morphological case is defined only formally or, to express it in modern terms, syntactically, there is a clear association (via the general rules) of the cases with semantic notions. Therefore, cases serve to connect form and meaning in Pānini's Sanskrit grammar. In the remainder of this work, the semantic content of case will be taken for granted, mainly based on the insights of Butt (2002, 2005, 2006) and Primus (1999, 2002, 2006). Because of this the Indian tradition is to be preferred to the Greek and Roman one in which case has been deprived of its semantic content. Since the western philosophical and linguistic tradition was based exclusively on the Greek and Roman legacy at least until the late 19th century, the Indian "knowledge" has had no chance to enter its intellectual history.

Therefore, the 2,500 years following Pānini are left out. In connection with 19th century nationalism the considerations of the ethnical roots of Germanic peoples also led to the (re)discovery and study of Indian languages.¹⁶ Nevertheless, it took another 80 years until the next noteworthy contribution to this short phase was published. In 1930 a paper by Frank R. Blake is important to mention. He has supplied a "semantic analysis of case" (Blake (1930, title)) in which he recognized that the use of the term "case" has always (in western linguistics) been used to denote only the formal relationships between a predicating element and its arguments. He also recognized that in every language there are possible non-formal relationships that hold between predicates and arguments, implying that there are impossible relations as well. This in turn means that there are regularities of possible relationships between predicates and arguments. In order to capture the regularities underlying these relationships which are semantic in nature a terminological distinction had to be made. Because the formal as well as the semantic relationships are coded by (morphological) case, Blake named the morphological case "case form"* and used the term "case" for the semantic relationships.¹⁷ (Cf. Blake (1930, 35). About the Greek and Latin grammar(ian)s, Blake stated that "no completeness of grammatical treatment is possible without recourse to the semantic approach." (Blake (1930, 48). Therefore, a semantic analysis of case had to be undertaken. Blake subdivides the possible case relationships according to predicating grammatical categories. There are cases for nouns, pronouns, adjectives, verbs, and adverbs. The present discussion will be confined to the verbal cases. Blake distinguishes immaterial from material cases. The latter describe relations in time and space, the former do not. There are 22 immaterial and four material cases (with further subdivisions). Among the material the most interesting are the following:

case/immaterial	denoted semantic content (examples)	corresponding thematic role (roughly)
subjective – independent	<i>The man</i> ate his dinner.	agent
subjective – subordinate	<i>The dinner</i> was eaten.	theme/patient
agential	It was eaten <i>by the man</i> .	agent (passive by-phrase)
instrumental	He ate it <i>with a spoon</i> .	instrument
accusative – direct affective	He cut <i>his hand</i> .	patient/theme
accusative – direct positional	He put <i>the book</i> on the table.	theme
accusative – indirect affective	He saw <i>the parade</i> .	theme/stimulus
accusative – cognate or intensive	He struck him <i>a heavy blow</i> .	?theme (result/effect) ¹⁸
mensural	This costs <i>five dollars</i> .	none (extent)
dative	He gave <i>the boy</i> a book.	recipient/goal/benefactive

(Cf. Blake (1930, 42))

Table 2.3: *Blake's immaterial cases assigned by verbs*

Blake aimed solely at listing the possible relationships. He did not try to make any generalizations about these relationships with respect to syntactic constructions of the sort: “the semantic case relationship *a* always occurs with the syntactic construction *x*.” Even less did he try to explain possible generalizations. It would thus be inappropriate to treat him along with the modern theories of chapter 4. The attempt to build theories of the semantics-syntax interface in connection with theories of the language faculty and language acquisition was reserved for later research.

Blake also did not distinguish between what is known as arguments and adjuncts. The former necessarily occurs with the predicate in order to form a grammatical sentence while the latter is only optional. In most modern theories adjuncts are not assigned thematic roles which reduces their number. Nevertheless, Blake recognized the relationships that led to the formulation of the sort of thematic roles that are now generally accepted, such as agent, patient, theme, stimulus, recipient, goal, benefactive. He discovered even more relationships that have not entered into more modern theories of thematic roles. Dowty (1991, 548, footnote 3) points this out, too.

The above-mentioned case relationships are only the “immaterial” ones. Blake gives no explanation for his distinction but it seems plausible that these relationships cannot be identified in terms of space and time but rather have a different ontological status. They are opposed to the “material” cases. Among these the most interesting cases¹⁹ are given below:

	stative	ablative	terminal	durational/ spatial	corresponding thematic role (rough)
temporal simple →	He came <i>before/after/at dawn.</i>	He has lived there <i>since the war.</i>	He has lived there <i>until the war.</i>	He has lived there <i>during the war.</i>	none
locative simple ↓	He lives <i>at the cross roads.</i>	He came <i>from France.</i>	He went <i>to the circus.</i>	They journeyed <i>through/across/ along the fields.</i>	
locative directional ↓	He hid <i>under the table.</i>	He came out from <i>under the table.</i>	He dived <i>under the table.</i>	The tunnel runs <i>under the river.</i>	
corresponding thematic role ↓	locative (not temporal)	source ²⁰ (not temporal)	goal/ location (not temporal)	location/goal (not temporal)	

(Cf. Blake (1930, 43ff.))

Table 2.4: *Blake's material cases assigned by verbs*

The distinctions made in the columns (from stative to durational/spatial) correspond roughly with the distinction between source/location/goal, according to the spatial organization of the event or action. With regard to the line “temporal simple” there are no modern thematic roles associated with the relationships described there. The reason is maybe that a lot less verbs necessarily take arguments which describe stative, ablative, terminal or durational relations. But this seems dubious with respect to verbs like *dauern/last*. In sum, Blake has discovered over a hundred case relationships and he has supplied a “pioneer study” (Dowty (1991, 548, footnote 3)) for later theories of thematic roles. Especially Fillmore’s Case Grammar* built on ideas that are similar to those of Pānini and Blake in their emphasizing the importance of case, while the “second invention” of thematic roles by Gruber (1965) is crucially dependent on Chomsky’s (1957) work.

One more excursus has to be made before finally arriving at the Chomskyan revolution and the linking problem in its modern shape. Once more following the Greek tradition (based on the arguments in Plato’s *Sophistes*) the philosophy of language has analysed an assertion as a pairing of a subject and a predicate.²¹ The *locus classicus* of this analysis is Aristotle’s (1995, orig. fourth century BC) *Organon*. Given the sentences (1) and (2), Aristotle analyses them as (1’) and (2’).

- (1) Plato knits.
- (2) Socrates molests the youth.

- (1') [Plato [knits]]
- (2') [Socrates [molests the youth]]

Mainly because these analyses failed with respect to the regularities of syllogisms²², Frege (1975, orig. 1891) proposed another analysis. He recognized or defined the predicating element, i.e. the verb, as a relational expression R with two strictly ordered subject expressions a and b entering into a particular relationship with it. In doing so Frege was the first to recognize the importance of the predicating element. The crucial relationship was that between the predicate – expressing a particular relation – and one or two arguments (nouns).

As a result, the view has changed from the Aristotelian subject-predicate division to the following notation.

- (3) $R(a, b)$
- (1'') KNIT (plato)
- (2'') MOLEST (socrates, the youth)

This strongly resembles the modern view of the relationship between a predicate and its arguments.

In the 1950s a change of paradigms in linguistics has taken place and it is undoubtedly and most closely connected with the name of Noam Chomsky. He defined linguistics as a part of cognitive psychology (Chomsky (1970, orig. 1968, 11) and caused some kind of “cognitive turn” in linguistics. Not all of the aspects, purposes and goals of his new concept of a linguistic theory are relevant here. But one central property of Chomsky’s theory that has pointed the way ahead for several decades is also central with respect to all the theories of thematic roles. It is the thesis of the autonomy, the self-containment, the independency (from semantics) of the syntactic component of a grammar. Lightfoot (2002, XI on Chomsky (1957, 17 & 1975, 19)) points out that

“grammars are autonomous and independent of meaning in the sense that their primitives are not defined in semantic terms.”

In Chomsky’s (1957, 103) own words:

“[W]e are studying language as an instrument or a tool, attempting to describe its structure with no explicit reference to the way in which this instrument is put to use. The motivation for this self-imposed formality requirement for grammars is quite simple – there seems to be no other basis that will yield a rigorous, effective, and ‘revealing’ theory of linguistic structure.”

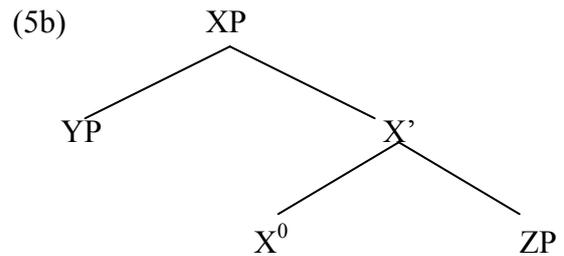
The autonomy of syntax and its independence from semantic notions is illustrated by the following famous pair of sentences (taken from Chomsky (1957, 15)).

- (4a) Colorless green ideas sleep furiously.
- (b) *Furiously sleep ideas green colorless.

Now, if the syntactic structure of a language must be thought of as consisting only of formal categories of the sort given in 5a) or 5b), and if the semantic representation of a particular sentence is represented as given in 6), the result can be put as the “linking problem”.²³

- (5a) i) $S \rightarrow NP + VP$
- ii) $NP \rightarrow T + N$
- iii) $VP \rightarrow \text{Verb} + NP$
- (Cf. Chomsky (1957, 26))

or



(Cf. Fanselow/Felix (1987, ch. 2.1) & Pinker (1994, ch. 4, esp. 103ff.))

- (6) Verb (x, y)

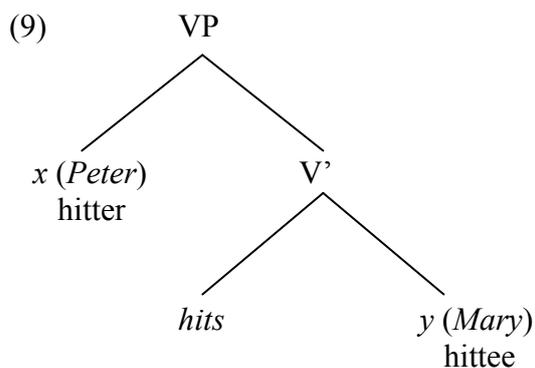
How are representations like those in 5a) and 5b) (reflecting different developmental stages of the formal syntactic architecture) connected? In other words: How does the formal syntactic device receive a semantic content or interpretation. An example: Given the phrase in 5b) was a VP and the verb in 6) was one like *hit*. It is clear that a simple grammatical, transitive sentence with *hit* then would have the following form:

- (7) x hits y .
- (7') The “hitter” hits the “hittee”.
- (7'') Peter hits Mary.

Then the proposition would be that given in 7).

(8) hit (x (*Peter*), y (*Mary*))
hitter hittee

The corresponding phrase structure tree would be that in 9).



It is clear that the predicate *hit* is semantically always associated with two arguments of which one is a hitting thing and the other is a thing hit. It is also clear that a grammatical active sentence (apart from strange contexts) containing the verb *hit* must have a subject that is the hitter and an object that is the hit one. And in the passive version of this sentence the object of the active sentence appears as the subject and the subject of the active version becomes an optional expression headed by *by*. Obviously, there are some generalizations possible that give rise to the assumption that the relationship between syntactic and semantic representation is not arbitrary.

In sum, there is evidence – brought about by Chomsky – that syntactic structure functions without recourse to semantics, and at the same time it was recognized that the generalizations between syntax and semantics are not accidental. A theory of grammar has to describe, explain, and to restrict such generalizations. In other words, it has to resolve the linking problem.

2.2 Thematic roles and their status in the theories

What has been said about *hit* and the arrangement of its arguments is also valid for a great number of other verbs like *murder*, *see*, *like*, *read*, *eat*, etc. It seems that the murderer, the “seer”, the “liker”, the reader, and the eater always occur in subject position/as nominative/in the structural position [Spec, VP], according to the particular theory. The central task of every

grammarians dealing with the relationship between syntax and semantics is to capture such generalizations that are obviously present and dominated by regularities. Moreover, there seem to be generalizations possible that go beyond the notions that have been used so far. Seemingly, if a *verb-er* (e.g. an *eat-er*) is present this must be in subject position/nominative case/[Spec, VP]. The *verb-ers* have something in common that seems to legitimate us to attribute an autonomous status to them in a linking theory: they may be called agents, and “agent” is thus the generalization among all the arguments of a verb that (as a very, very provisional characterization) “do something”. As a result, the invention of thematic roles seems a natural consequence when the linking problem is raised.

It is remarkable but not surprising that the recognition of the regularity of the relationship between form and meaning led to deviations from the Chomskyan paradigm as well as to further developments. Nevertheless, every subsequent theory had to concern itself with Chomsky’s theses and every subsequent theory developed either in agreement with Chomsky’s theory or as a differentiation from it. Indeed, the theories following Chomsky (1957), with Chomsky, (1965, 1981, 1995) as the main stages – though sharing similar ideas – steadily turned away from the idea of an autonomous syntax, i.e. that syntactic constructions are in no way driven by semantic matters (cf. Bouchard 1995, ch. 1.2).

In the preceding sections the arguments for a distinction between syntax and semantics have been sketched and the linking problem has been outlined. In addition, the invention of thematic roles in connection with the attempt to solve the linking problem has already been indicated. For the sake of the chapters to come a definition of the notion of thematic roles as a working hypothesis will now be supplied. The first question asked in chapter 1 has been:

i) What are thematic roles?

It has been shown that thematic roles are a result of the linking problem and that they serve to capture the relationship between syntax and semantics with respect to predicates and their arguments. One example – that which has been called “agent” – has already been given. With this in mind a working hypothesis can be formulated (for another characterization cf. Butt (2005, 48ff.)):

Thematic roles are generalizations among the arguments of a predicate in order to capture regularities between the semantic representation and the syntactic expression of that predicate.

A more precise definition is not possible due to the ongoing discussion about the number, content and theoretical status of thematic roles. Therefore the above-mentioned formulation makes no reference to particular theories of grammar and is as general as necessary so that it

matches all the theories. (For different & early proposals cf. Gruber (1965), Halliday (1967), Fillmore (1968), Huddleston (1970), Jackendoff (1972); for a general discussion cf. Dowty (1989, 1991) who has devoted himself to the discussion of thematic roles; Butt (2005)).

ii) What are theories of thematic roles good for?

Undoubtedly, syntax can be described solely formally, i.e. without recourse to semantics. Nevertheless, there are some obvious and systematic generalizations possible between both representations. The purpose of thematic role theories may be formulated as follows:

In order to describe, restrict and explain those generalizations the notion of thematic roles promises to be a very helpful one. (For the most prominent attempts to characterize the generalizations cf. Rosen's (1984, 40) UAH*, Baker's (1997, 2 [first 1988]) UTAH*, and the RUTAH (Baker (1997, 29ff.) referring to Larson (1988, 382))).

It is difficult to characterize the notion "explain" here. Chomsky uses the term to adequately restrict the generation of grammars to possible grammars which are natural languages. Depending on the kind of theory it may also denote the attempt to find out the cognitive significance of these generalizations or their significance with respect to language acquisition. (Among others cf. Bornkessel/Schlesewsky (2006) building on RRG*, van Valin (2006), Talmy (2001, 2003), Carlson/Tanenhaus (1988), Clark/Carpenter (1989), and with another account Jackendoff (1972, 1983, 1987, 1990, 1993, 2002)). Another possibility (or combined with the above) is that it refers to the attempt of embedding the generalizations coherently and consistently into a universal model of the syntax-semantics interface. (Most of the theories have this goal, among them Carlson (1984), Dowty (1979, 1991), Ladusaw/Dowty (1988), LMT*, RRG, Theta-theory). Dowty (1989, 70) states that

"if thematic roles are indeed the fundamental categories of linguistic structure that [...] linguists assume they are, then we should expect research involving thematic roles to converge on a consistent system."

This points in the direction of the latter characterization. Dowty expresses here the necessity for a definite set of roles, for clear definitions for the roles and for a clearly and precisely determined theoretical status of the roles as the major challenges of a theory of thematic roles. This leads to the next question.

iii) Which are the roles?

Questions concerning particular roles will be discussed in greater detail in ch. 3 and 4. Nevertheless, the most common thematic roles will be listed here together with very rough and prototypical definitions.

thematic role	definition with respect to the event or action	reference, e.g.
agent	volitional instigator	Gruber (1965)
patient	affected entity	Baker (1988, 1996, 1997)
theme	entity undergoing movement	Jackendoff (1972)
goal/source/location	place or entity to/from/at which event or action is directed/coming from/located	Carrier-Duncan (1985)
recipient/benefactive	entity that is addressee or beneficiary	Bresnan/Kanerva (1989)
experiencer	entity being in a mental state	Grimshaw (1990)
instrument	entity used/utilized in order to execute even or action	Fillmore (1968)

Table 2.5: *Canonical thematic roles and prototypical definitions*

In order to avoid confusion some result of later sections must be anticipated here. The above table suggests more agreement than there actually is. It is possible that there is not even a single definition of a particular thematic role that is shared by two theories. The value of table 2.5 is that it shows the approximate canonical roles. Their existence – apart from their exact definition and function in each theory – is most of the time taken for granted. Thematic roles not included in the table can be classified as exceptional.²⁴ Yet, among the exceptional roles there are differences of prominence. And so, e.g. the stimulus role²⁵ (cf. ch. 3; Blansitt (1978)) is more common than the force role²⁶ (cf. ch. 3; Huddleston (1970)).

iv) What conceptions of thematic roles are there?

Because chapter 4 deals mainly with empirical matters, i.e. the resolution of the problems stated by the phenomena presented in section 3, some theoretical questions must be cleared up here. Anyway, it will be tried to avoid any redundancies. Up to this point it has been shown what reasons there are to assume something like thematic roles, what they are, and which canonical roles there are. So far nothing has been said about

- a) the varying status of thematic roles in particular theories and
- b) the main stages of the development of thematic roles from Gruber up to the present,

and

c) the question whether they are primitive* notions or not,

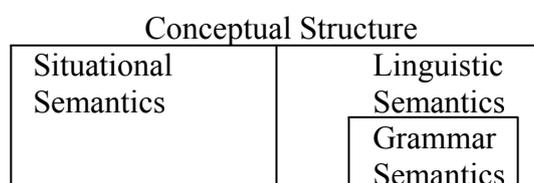
although these are of central importance to a work that deals with a comparison of thematic role theories. It is important to notice that conflicting positions are only presented comparatively in this chapter. A decision which of the alternatives are to be preferred cannot be supplied here. Discussion and critique are mainly reserved for chapter 4 in connection with the different phenomena which will be the only measure of such decisions.

Question a) above is ambiguous with respect to the meaning of “status”. First, it denotes the question what kind of knowledge is included in the notion of thematic roles or, in other words, what kind of knowledge finds its way from semantics to syntax? The first possibility is that semantics can be equated with the global knowledge of the world, i.e. all the knowledge a human being may gain is linguistically relevant in the sense that categories of human knowledge are reflected by grammatical categories. The other position that is closely related to the original ideas of Chomsky assumes that syntax and (grammatically relevant) semantics are of the same structure, i.e. sharing their categories. This in turns implies that there is a kind of semantics that is irrelevant to syntax, or grammar, respectively. Only the grammatically relevant semantic units are therefore part of the syntax-semantics interface, according to this view. This may be due to the idea of a semantic representation that is projected from syntax and that cannot contain information that is not included in syntax. The first of the above positions is prototypically defended by Jackendoff, namely by the idea of a “conceptual structure” as part of “conceptual semantics” that has been worked out by him since 1983. Jackendoff (1987, 375) states:

“[...] Conceptual Semantics is worked out according to first principles parallel to those that motivate generative syntax and phonology – the need for finite representability, the creative application of concepts in situations one has not encountered before, and above all the necessity that concepts be learnable from a sufficiently rich innate basis.”

And with respect to the kind of knowledge involved: “It is by virtue of these connections to other modalities [to the human visual system – S. K.] that linguistic meaning can be coordinated with understanding of the perceived world.” (Jackendoff (1987, 376)). From these quotations it becomes clear that for Jackendoff all information gained via the human perception is linguistically relevant. And if there is some innate knowledge or faculty involved in language it is not only this that is relevant for grammar, but also the knowledge

perceived through the sense organs. As a prototypical contrasting position to that of Jackendoff's conceptual semantics Bouchard's (1995) minimalist approach may be mentioned. He (1995, 3) states, that "most linguistic theories are based on the wrong semantics." This explicitly includes Jackendoff's position. Bouchard assumes that conceptual structure is subdivided into different "sorts" of semantics. Only "Grammar Semantics" are accessible by syntactic structure and may alter syntactic structure. Grammar Semantics are of the same form as syntax, i.e. they are organized in tree-like structures. Grammar Semantics are part of "Linguistic Semantics" which are also of some linguistic relevance. They are coordinated to "Situational Semantics" which belong to the conceptual system but do not have anything to do with language faculty or linguistic structures. The relationships are given below.



(Bouchard (1995, 17))

Figure 2.1: *Bouchard's conceptual structure*

Bouchard (1995, 16) locates thematic roles in S-semantics and excludes them from the study of grammar. Theories of this kind will not be dealt with in this work. Their mentioning rather serves to demonstrate some ongoing theoretical discussions about thematic roles. One prominent proposal in which thematic roles are also analysed as extra-linguistic notions but are used to constrain linking is that of Dowty (1991) & Ladusaw/Dowty (1988) (also cf. Härtl (2001, ch. 2.1.2 on this discussion)). Lexical decomposition approaches to thematic roles take a similar stand to Bouchard's in that they try to capture only the grammatically relevant aspects of the meaning of a predicate (see further below in this chapter and ch. 4.3 & 4.4 on such theories). Pinker (1989, 166) formulates the "grammatically relevant subset hypothesis":

"Perhaps there is a set of semantic elements and relations that is much smaller than the set of cognitively available and culturally salient distinctions, and verb meanings are organized around them. Linguistic processes [...] would be sensitive only to parts of semantic representations whose members are elements of this set."

Closely related to the above-mentioned question is the following: Are the concepts that are captured by the notion of thematic roles thought of as cognitively “real” or purely as notions of a semantic model? Or do they have some different status? As a first example, Croft’s (1991, ch. 4) roles are derived from the causal organization of events which in turn is thought of to be cognitively represented, based on an idealized cognitive model (cf. Croft (1991, 165f.)). Jackendoff (1972, 1) hopes that his proposed “semantic representation, it is reasonable to hope, is very tightly integrated into the cognitive system of the human mind.” This, of course, applies also to his concept of thematic roles, as a part of the semantic representation. In connection with his THC (cf. ch. 4.2.1) he (1972, 379) states: “One would hope that these cases can eventually be shown to have conceptual rather than formal force.” (Cf. also DeLancey (2000, 5f., among others). In Jackendoff’s later works (1983, 1987, 1990, 2002) thematic relations are read off the conceptual system. Butt (2005, 101ff.) compares Jackendoff’s position with those of Kiparsky (1997) and Wunderlich (2000 and subsequent) who assume a similar organization of grammar. In their theories there is a similar distinction: that between the overall conceptual system which contains thematic roles (cf. Wunderlich (2000, 250)) and the Semantic Form (SF) which represents linguistically relevant knowledge (decomposed lexical structures).²⁷

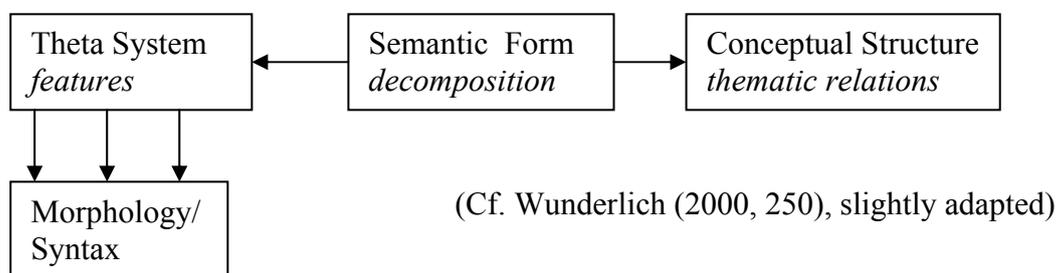


Figure 2.2: *Wunderlich’s LDG* architecture*

In contrast to these positions Jackendoff (1987, 374) states, that “in model-theoretic semantics, meanings are taken to involve sets of individuals in possible worlds, a conception of meaning patently not squeezable into a finite mind.” These model-theoretic semantics will not be taken into account in this work due to their minor relevance with regard to the main topic of thematic roles. It turns out, then, that most of the theories presented here claim cognitive relevance for their theories, while model-theoretic semantics go back to Tarski’s (1977, orig. 1944) concept of semantics which is closely related to exclusive philosophical discussions about theories of truth. Anyway, the proposal best known to linguistic theory has been that of Montague (cf. Dowty (1979)).

Another question concerning the status of thematic roles is whether they are of syntactic or semantic nature. Further above it has already been mentioned that Chomskyan theories turned away from a purely syntactic view. What reasons are there to assume that thematic roles are syntactic notions? In the early days of Generative Grammar in which syntax has more consequently been considered autonomous and self-contained the semantic interpretation was considered to be projected from deep structure (e.g. cf. Jackendoff's (1972) discussion of the Katz-Postal Hypothesis.) Therefore, thematic roles are in some sense already included in the structural representation of a sentence and then purely read off. It seems that they can be seen as a syntactic concept in so far as they are embedded in a completely structurally defined environment.

At this point, another distinction must be made. One notion of thematic roles can be called "argument-indexing" (adopted from Dowty (1991, 549)). In this view which belongs to Chomskyan theories (Aspects, P&P, etc.) thematic roles serve to index arguments during the derivation in order to "keep track of identity and distinctness of NPs of particular semantic arguments of a predicate." (Dowty (1991, 549)). This view contrasts those who decompose lexical semantics in order to derive thematic roles from them. With these theories thematic roles are not primitives and serve another function than in the argument-indexing view (cf. Jackendoff's CS, Wunderlich's LDG*, van Valin's RRG* and others). Further below in this section the connection with the question of primitivity will be picked up again.

The originally syntactic character of thematic roles is also indicated by the notion "θ-role" (cf. Butt (2005, 55ff.)). On the other hand θ-roles are contained in the lexical entry of predicating elements and are therefore semantic in kind. Butt's recent work (esp. 2005) has primarily dealt with the semantic content of case and she (cf. Butt 2006, 70) has emphasized the connection between semantically defined case and particular thematic roles. However, for Butt thematic roles cannot be defined syntactically (as well as for Carlson (1984), Carlson/Tanenhaus (1988), Culicover/Wilkins (1986), Jackendoff (all), among others).

Similar to that, for Dowty (1989, 70)

"[i]t seems obvious that if any independent justification for a substantive, motivated, and reasonably precise theory of thematic roles is going to be found, it will have to come from semantics. [...] I know of no proposed way of characterizing thematic roles that is not [...] semantic."

The view on thematic roles has slightly changed during the 1970s because of the invention of argument structures*.²⁸ It became clear that there are regularities among predicates and arguments irrespective of their syntactic categories. Such redundancies have given cause to

the assumption that lexical entries might include both syntactic categories, distinguishing one from the other with respect to their syntactic role by several lexical rules. Argument structures have been further developed and often have become the place in a grammar where thematic roles are located. Argument structure was considered as interfacing lexical semantics and syntax, as in Bresnan's (1995) LFG*, or semantic structure and lexical structure, as in Wunderlich's (2000 and subsequent) LDG*, or as part of lexical entries, as in Grimshaw's (1990) proposal and P&P's* θ -grids (e.g. Chomsky (1981), Fanselow/Felix (1987); cf. Carrier-Duncan (1985), Rappaport/Levin (1986), Goldberg (1995, ch. 1), Ryu (1997), Levin/Rappaport-Hovav (2005) on the notion of argument structure). Nevertheless, an abstraction from particular theories may approximately be captured as given in Figure 2.8.

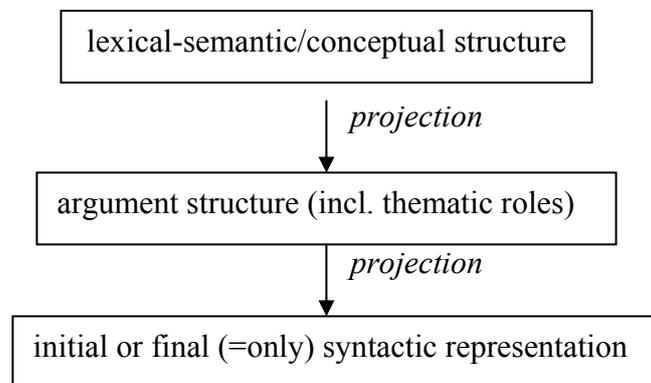


Figure 2.3: *The role of argument structure in theories of grammar*

The next question is where thematic roles are linked to. This will be answered mainly throughout chapter 4. For now, there are apparently three possibilities. First, thematic roles may be linked to structural positions in tree-like structures, e.g. X-bar structures. This is actually the case with all linking theories within P&P* and some related ones (e.g. Chomsky (1981), Williams (1981), Baker (1988 and subsequent), Belletti/Rizzi (1988), Grimshaw (1990), among others). Here, linking is mainly provided by an association of θ -theory with case theory. Second, thematic roles may be linked to grammatical functions*. This is the case with LFG* as well with LMT* approaches (which are embedded in the former). Marantz (1984)²⁹ in his modified P&P approach, Dowty (1991) and many others also link to grammatical functions. It is important to note that in recent research the universal applicability of grammatical functions has been called into question. One could even say that there is evidence against the universality of grammatical functions (cf. Kibrik (1997),

Newmeyer (2002), van Valin (2005)). Thematic roles may finally be linked to the case system of a language. In van Valin's RRG macroroles are linked to cases as well as in Primus' (1999 and subsequent) Proto-role approach, Wunderlich's (2000 and subsequent) LDG*, and Kiparsky's (1997) proposal.

It turns out, then, that there is a tendency in the latest approaches to the syntax-semantics interface to avoid the notion of grammatical functions and, instead of this, to rather rely on case. In conclusion there is a certain advantage for possibilities one and three with respect to the claim of universal applicability of the theories.

Throughout the history of thematic role theories it turned out that not all thematic roles were of the same kind. This has led to what might be called "multi-dimensional accounts"* to thematic roles. For example, Croft (1991, 176ff.) assumes two different kinds of roles, namely "oblique" and "direct" thematic roles where the former "can be generally described in terms of the ordering of participants in the causal chain [...]." They play a role only in the causal decomposition of actions and events and are more likely of cognitive significance. In contrast, direct roles "normally become subject and object (or occasionally indirect object)." They are therefore "directly" projected into syntax. Grimshaw (1990) proposes a thematic dimension and an aspectual dimension in the argument structure of a predicate. The former contains the canonical set of roles while the latter is derived from the event structure of the different verb-classes of a language. Jackendoff (1987, 394ff.), elaborating his idea of conceptual structure, proposes "a 'thematic tier' dealing with motion and location, and an 'action tier' dealing with Agent-Patient relations" in order to enhance conceptual structure. In doing so Jackendoff adopts a suggestion of Culicover/Wilkins (1986) who first proposed a multi-dimensional approach. They (1986, 123) distinguish between "extensional" roles (corresponding to the thematic tier) and intentional roles (corresponding to the action tier). Culicover/Wilkins are convinced

"that the assignment of thematic relations is to be determined by these models of non-linguistic cognitive systems. In other words, we expect the set of possible thematic roles to be defined by universal constraints on perception and action theories, rather than by constraints on the system of grammar."

This clearly contradicts Bouchard's (1995) position (cf. above in this section). What all multi-dimensional theories have in common is the attempt to distinguish aspectual/causal from thematic notions (in the sense of spatial relations). Such approaches to thematic roles contribute to the solution of co-occurrence problems of roles: E.g. agents and causers will not

co-occur with a single predicate (as distinct arguments) because they presumably occupy the same positions in the causal/action/aspectual tier. In addition, many agents, for example, are sources and many experiencers can be analysed as goals.

The above proposals have an intermediate status in the history of thematic roles. With respect to question b) above (i.e. the main stages of the development of thematic role theories after Gruber) they can be classified as a further development of thematic role hierarchies, which in turn followed discrete role theories. Multi-dimensional approaches to thematic roles themselves were followed by generalized roles and feature decomposition proposals. Although these stages are additionally reflected by the structure of chapter 4, they are (in a simplifying way) shown in the figure below.

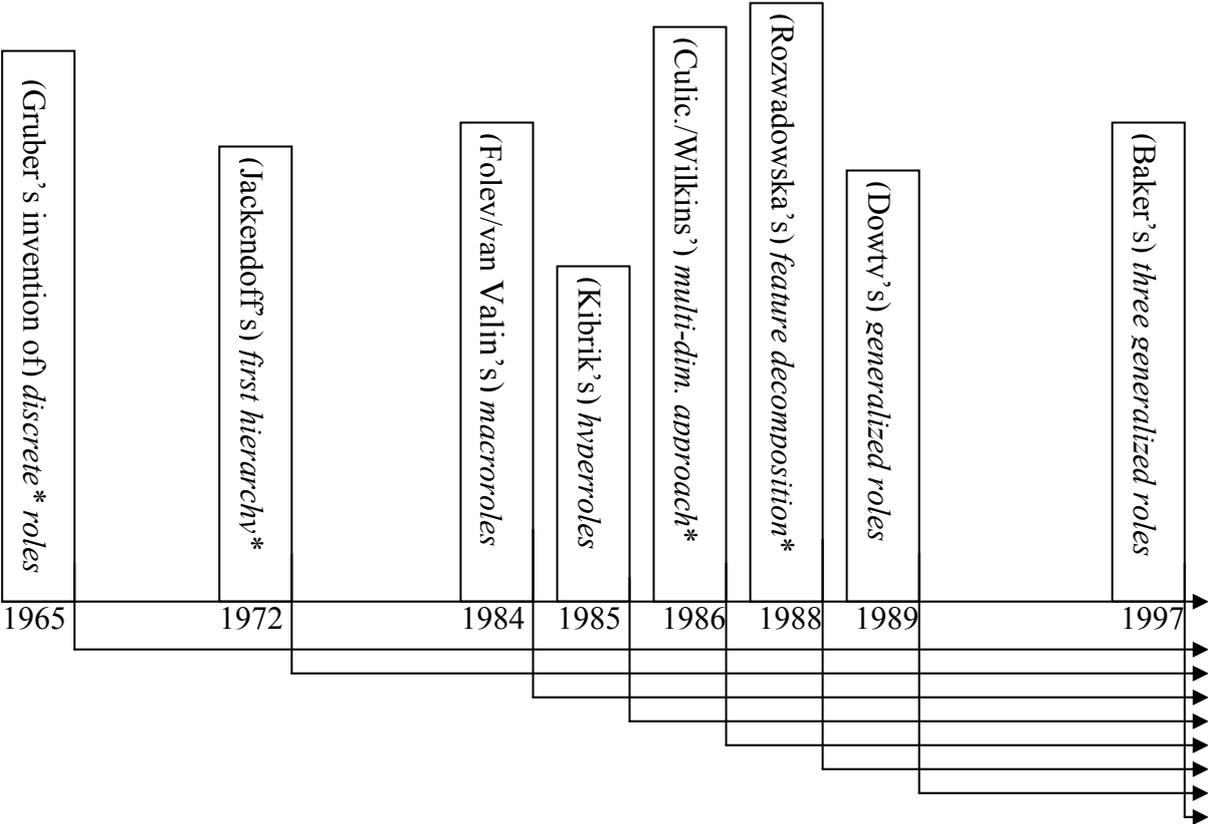


Figure 2.4: Main stages in the development of thematic roles from Gruber on³⁰

A remaining question is whether thematic roles are primitive* notions which cannot be further analysed down to smaller units or whether they can (i.e. question c) above). Thematic role theories which use some kind of i) conceptual, ii) lexico-semantic or iii) logical or feature

decomposition and identify positions in logical structures with thematic roles can be described to give a negative answer to the question. Theories like these are based on the assumption that the concepts of thematic roles that are expressed by lexical items can be further analysed down to smaller features or logical structures. The first of these proposals that need mentioning here is the one of Jackendoff (1972, but also valid for the subsequent works). He derives thematic roles from positions in conceptual/functional structures of lexical items which consist of primitive notions (like CAUSE and CHANGE, cf. ch. 4.2.1 in this work). Pinker (1989, 73) decomposes thematic roles in terms of “thematic cores”. They are associated with argument structures of predicates and schematize “a type of event or relationship that lies at the core of the meaning of a class of possible verbs.” Similar to Jackendoff’s theory, thematic roles correspond to positions in these decomposed structures. DeLancey (2000, 9) also defends a localistic decomposition: “[T]here is abundant lexical evidence suggesting that the cognitive model of cognition and emotion is fundamentally localistic: in English one can have something *in mind* or *on one’s mind* [...] etc.” Goldberg (1995, 28) states with respect to lexical decomposition approaches that they try to capture only the grammatically relevant aspects of the meaning of a predicate (cf. above in this section). She equates the semantic decompositional structures e.g. of the sort by van Valin and Pinker with the meanings of constructions in order to capture those grammatically relevant aspects of meaning. Anderson (1977) gives an early localistic proposal, in his case for Case Grammar, and Carter (1988, orig. 1976) also uses lexical decomposition. Wunderlich (2000 and subsequent) decomposes predicates semantically and in different stages (Semantic Form, Conceptual Structure, Theta Structure) where Theta Structure reflects thematic features that are relevant for syntax. His proposal is similar to Kiparsky’s (1997). Building on suggestions of Pesetzky (1995) Reinhart (2000) decomposes thematic roles via features. A different kind of decomposition that can be called logical is that of Dowty (1979). By adopting ideas from formal semantics and in making them compatible with grammatical structures he became the precursor of many decompositional approaches to thematic roles. Based on Vendler (1967b) he introduced the notions DO, CAUSE, BECOME into phrase structure trees; (admittedly, some of these notions were used before Dowty but not in a comparable systematic way, cf. Ross (1972)) Building on Dowty (1979), a similar kind of logical decomposition can be found within van Valin’s RRG* in which verbal semantics are lexically decomposed, also based on Vendler’s (1967b) *aktionsarten*. The outcome, logical structures of verbs, consists of different positions. With reference to these positions thematic roles (early RRG) or macroroles can be determined. Last but not least Primus’ (1999 and subsequent) proposal must be mentioned

because of its original character. She formalizes the proto-role account of Dowty (1991) with the result of some kind of logical decomposition.

In sum, the theorists mentioned above belong to the great number of those who have rejected the idea of primitive* thematic roles. The contrasting position is the holistic* approach to thematic roles. Under this term all the theories that are closely related to Chomsky's work (Aspects, P&P and related) can be subsumed. Thematic roles are held primitive in these theories. They rely on the assumption, that the concepts denoted by thematic roles are a universal set of possible conceptualizations of predicate-argument relationships. Because of methodological and empirical reasons it is most of the time coupled with the proposal of a possibly small set of thematic roles (e.g. cf. Gruber (1965), Fillmore (1968), Baker (1988), Larson (1988), Belletti/Rizzi (1988), Grimshaw (1990), early LFG etc.).

Without attempting to decide conclusively which of the alternatives is to be preferred, it can be stated that the latter position is connected with severe theoretical problems. This will become clear throughout chapter 4. But the idea of decomposition has encountered challengers who question its validity. It is easy to show that there are situations describable in which *kill* is not synonymous with CAUSE TO DIE. "The status of this kind of argument is, however, moot." (Fodor/Lepore (2000, 1)). Nevertheless, it cannot be completely denied. If decomposed structures are thought to capture at least the grammatically relevant aspects of meaning, then meanings must be decomposed in the "right way". But there is no criterion of the right way of decomposition. In addition, Fodor (1970) and Fodor/Lepore (2000) show some other problems with the concept.

To conclude this chapter, a more basic question must be discussed. In the 1990s a position has emerged which denies the potential of thematic roles with respect to the linking problem, in part or completely. The idea is that aspectual notions in addition to or instead of thematic notions constrain linking regularities. The moderate view is already reflected in Dowty's (1991, 567ff.) concept of an "incremental theme". According to this, "the meaning of a telic predicate is a homomorphism from its (structured) theme argument denotations into a (structured) domain of events." (Cf. ch. 4.3.2 for further discussion). This aspectually defined notion is relevant with respect to the formulation of Dowty's (1991, 576) argument selection principle. Incremental themehood is considered to be a property of the grammatical function* object. Building on Dowty, Tenny (1992, 2) has developed the "Aspectual Interface Hypothesis":

“The mapping between thematic structure and syntactic argument structure is governed by aspectual properties. A universal aspectual structure associated with internal (direct), external and oblique arguments in syntactic structure constrains the kinds of event participants that can occupy these positions. Only the aspectual part of thematic structure is visible to the syntax.”

Thus, for Tenny (1992, 20) it is aspect that constrains the mapping of thematic roles into syntax. As an argument against Tenny’s conception of the AIH and Dowty’s proto-patient entailments Jackendoff (1996) has shown that subjects may be measuring arguments (i.e. incremental themes) as well. Nevertheless, aspect is obviously relevant for linking.

A radical position is defended by Arad (1996) who dismisses thematic roles from her (minimalistic*) theory. She constrains the syntax-semantics interface solely in terms of aspectual projections.³¹

In this work the view is adopted that aspect plays a role in linking syntax and semantics and is interdependent with thematic notions. Consequently, this will be discussed in the course of ch. 4 (e.g. cf. Baker (1997, 117ff.))

On the other hand, the radical view taken by Arad must be rejected. It crucially relies on an identification of the event measurer with the theme or object of a telic verb. But this is not a legitimate identification. “Although the patient of a COS [change of state – S.K.] MUST be that verb’s incremental theme, the theme of a verb entailing change of location need not be that verb’s incremental theme.” (Rappaport-Hovav/Levin (2002, 10)). As a result, aspect alone cannot constrain linking.

Finally, there is an interesting relationship between thematic roles, aspect, and grammatical transitivity.

“Transitivity is traditionally understood as a global property of an entire clause, such that an activity is ‘carried-over’ or transferred’ from an agent to a patient. Transitivity in the traditional view thus necessarily involves at least two participants [...] and an action which is typically effective in some way.” (Hopper/Thompson (1980, 251)).

Even in the definition of transitivity thematic roles are included. Among the components of transitivity determined by Hopper/Thompson (1980, 252) there are at least three which are connected with thematic roles (cf. ch. 3 for further discussion): “volitionality”, “agency” with agents and “affectedness of O” with patients. Maximal transitivity is – not incidentally – associated with the involvement of the upper and lower ends of the thematic hierarchy*.³² In other words, the degree of transitivity seems to be co-extensive with the occupation of

positions in the thematic hierarchy at the upper and lower ends. Furthermore, “kinesis”, “punctuality” and “aspect” have to do with aspect and aktionsarten. The questions whether there is action and telicity or not is also closely related to the roles that are present in a sentence. And “individuation” as a property of transitivity refers to lexical features of items, which, in turn, are connected with thematic roles.³³ Two parameters of transitivity, “affirmation” and “mode” are left, then (assumed that the presence of two “participants” is a trivial condition). These relationships suggest the close connection of transitivity, aspect, and thematic roles (cf. also DeLancey (1984), van Voorst (1996)).

Apart from this the data suggest that it might be possible to replace the notion of thematic roles by the combination of the concepts of aspect, transitivity, lexical features, mode and case features. To put it differently, these notions might serve to capture, describe and explain the same range of data as thematic roles – with additional methodological advantages, since their existence is guaranteed. An answer to this question cannot be given here. It is reserved for further research. Cf. chapter 5.

In sum, the most important questions concerning the status of thematic roles should have been cleared up throughout this chapter. Their mentioning is necessary to secure the understanding of the following sections – they are theoretical prerequisites for more empirical questions.

3. Challenging phenomena and related questions concerning thematic roles

The language phenomena to be presented in this chapter are taken from English and German. They are challenges for theories of linking with respect to argument selection, distribution, and thematic roles. They are supposed to pose increasing difficulties for the theories in the following chapter. The reason for their ordering will become evident throughout the presentation. In connection with the phenomena important questions concerning thematic roles will be discussed (according to questions a)-f) in ch. 1). Not all of the roles are relevant with respect to the phenomena below. Therefore, these roles will not be discussed. Nevertheless, many aspects of the discussions of the last decades will be mentioned and outlined. The rough definitions of the canonical roles in table 2.5 above will be complemented by some more aspects and details throughout this chapter.

3.1 Split Intransitivity*

Consider the following sentences.

- | | |
|----------------------------------|---|
| (1a) Peter stirbt. | (3a) Peter dies. |
| (1b) *Peter stirbt absichtlich. | (3b) *Peter dies intentionally. |
| (1c) *Hier ist gestorben worden. | (3c) *There is much dying around here. |
| (2a) Peter tanzt. | (4a) Peter is dancing./Peter dances. |
| (2b) Peter tanzt absichtlich. | (4b) Peter dances intentionally. |
| (2c) Hier ist getanzt worden. | (4c) There is much dancing around here. |

Obviously, there are some systematic differences between the intransitive sentences in (1) and (3) on the one hand and (2) and (4) on the other. While all sentences are intransitive, only (2) and (4) seem to be agentive, which is indicated by the possible adjuncts *absichtlich/intentionally* and the applicability of the passive/*there*-construction. The first systematic approach to this split intransitivity* was given by Fillmore (1968, 53). He analyzed unergative verbs (those in (2) and (4)) as having an argument that is an “active” subject, which is animate and instigating the action. Unaccusative verbs ((1) and (3)), in contrast, have an argument that is affected by the action and an “inactive” subject”.³⁴

Until today there has been no agreement as to which exact criteria motivate the split between both intransitive versions. In connection with Chomsky's theories and within RG*, structural/syntactic explanations were given (cf. Fanselow/Felix (1987, ch. 3.1), Perlmutter (1978, 1983, 151ff., the "Unaccusative Hypothesis"*)). Both P&P* and RG assume an underlying/initial subject/1 for unergatives and an underlying/initial object/2 for unaccusatives. Rosen (1984, 61ff.) pointed out that there is a lack of universality due to some verbs like *bleed* which differ from language to language with respect to their intransitive status. In some languages they are unergative, in others they are unaccusative.

In the late 1980s, some new semantic approaches to the topic were published. Holisky (1987, 107) has summarized previously proposed criteria for the split. "Intentionality" can be added to his list as a result of his own analysis (e.g. 1987, 111):

unergatives	unaccusatives
voluntary participation	involuntary participation
agentivity	non-agentivity
control	no control
activity	passivity

Table 3.1: *Some semantic criteria for split intransitivity until the 1980s*

The figure above indicates the crucial involvement of notions that are associated with the common definition of agentivity. "Agent" undoubtedly is the most discussed thematic role and since it seems to be the central factor with respect to split intransitivity, part of this discussion will be outlined here.

Even Gruber (1965), the inventor of the agent-role, has not given only one definition of "agent", but two. He has distinguished a wilful permissive agent who permits the action or event from a wilful causative agent who causes a change of state denoted by the verb. Jackendoff (1972 and subsequent), following Gruber, has analyzed agents as individuals causing an effect, with no further specifications. Later, he has taken volition, acting and instigation into account, too (1983 and subsequent).

Huddleston (1970), building on Fillmore's (1968) work, proposed a two-way distinction between agents (intentional action) and "forces" (1970, 504) (no intention, inanimate) which are both included in a role "causer".

Halliday (1967) has made another distinction, that between an "initiator" and an "actor" and an "initiating actor". The two latest are compatible with Gruber's causative agent, but the idea

of a permissive and an initiating agent seem to contradict each other with respect to some kind of “involvement” or “activity”. What Halliday also did was to point out the connection of agents with the verb *do*. Sentences of the form *x Vs* allow paraphrases like *What x did was V* only if *x* is an agent. Ross (1972) introduced *do* into tree-like structures in order to represent any verb describing action. It was thought to be the syntactic correlate of Davidson’s (1967) semantic predicate “intentional”. Both were intended to mark agentivity. In formal respect, this was a step forward, since it was foreshadowing Dowty’s (1979) decompositional theory, which in turn had great influence on many others (e.g. Foley/van Valin (1984)). With respect to the concept of agentivity, it was a step back, because Fillmore, Halliday and Gruber had already given more sophisticated analyses.

Cruse (1973) has further analysed the semantics of “doing something”, which had had too broad a range of application in Ross’ theory. “Willing is a kind of doing, whether what is willed is a state, process or action.” (Cruse 1973, 18). “Effects” are also in a “do-relationship” with a verb. “Initiative”, i.e. the “initiation of an action by giving a command” (1973, 20) is another feature of agents. The most important quality of agents is “agentive”, which is “referring to an action performed by an object which is regarded as using its own energy in carrying out the action.” Cruse’s analysis of the features of agents was up to this point the most fine-grained. His “Volitive”, “Effective”, “Initiative” and “Agentive” include Gruber’s concept of agent as well as Halliday’s and Fillmore’s.

Dowty (1979) adopted Vendler’s (1967) *aktionsarten**, McCawley’s (1968) first attempts of decompositions (with [CAUSE [BECOME]] base predicates) and Ross’ and Cruse’s ideas with respect to the predicate “DO”. He (1979, 117f.) has restricted its application to “acts of the will” and intention in order to differentiate between e.g. *look* ([DO (x) see (x, y)]) and *see* ([see (x, y)]). Where DO applies, *y* is (per definition) under the unmediated control of the agent. This has become another factor in the discussion of agentivity: the distinction between unmediated and mediated or direct and indirect causation. There is agreement about the “higher” degree of agentivity of the former.

It is also noteworthy that Hopper/Thompson (1980), Tsunoda (1981) and van Voorst (1996) have taken the concept of transitivity, tense/aspect/mood and “energy transfer” (van Voorst) into account in their important papers. It seems that these concepts are closely related to thematic relations, i.e. the degree of transitivity seems to be coextensive with the degree of agentivity on the thematic hierarchy, whilst the exact interrelations must remain open here.

DeLancey (1984) has also examined the correlation between agentivity and transitivity.

“[T]he prototypical transitive event is one which can be traced back to a single cause from which an unbroken chain of control leads to the effect. This ultimate cause can only be an act of volition on the part of a (thus defined) prototypical agent. This act of volition directly engenders an action on the part of the agent, which may in turn be extended through an instrument, and then impinges directly upon the outside world.” (1984, 207).

Nevertheless, another aspect of his paper is more important. He (1984, 208; cf. also Schlesinger (1989)) concludes that it will be

“impossible to give an explicit definition of the notion agent [...]. It is relatively easy to identify prototypical agents, but the nature of reality and human perception of it is such that we will always be left with a residue of quasi-agents, causes which deviate from the agentivity prototype but certainly can't be identified as anything else.”

Holisky (1987) has shifted the view on agents in a similar but more influential way. In a paper on Tsova-Tush he gave the following definition of agent (1987, 115): “An agent is a human participant to whom is ascribed volition and conscious (mindful) control with respect to the situation denoted by the verb.” The crucial factor here is the *ascription* of control. This is done via a pragmatic principle (1987, 119): “You may interpret effectors and effector-themes which are human as agents (in absence of any information to the contrary).”

Van Valin (1996) has tried to show that “agent” must be reserved exclusively for intentional (via conversational implicature) actions, while “effectors” act instinctively, accidentally (van Valin (1996, 306f.)). Real agents, whose agentivity is required by verbal semantics, are then represented as [DO], effectors as [do] in logical structures. There are only a few verbs remaining that are real agents, like *murder*. Van Valin (1996, 313) has determined three factors that govern agentivity: “the lexical semantic properties of the verb, the inherent lexical content of the NP argument, and the grammatical construction in which the verb and NP co-occur.” According to him (1996, 314f.), an optimal agent will have the following properties: a singular speaker, discourse participant, human, rational, intentional, volitional, animate, concrete entity. The differences between agents, forces and instruments are given below (van Valin 1996, 319):

agent: animate (preferably human), effector (preferably instigator)

force: inanimate (motive), effector, instigator

instrument: inanimate (nonmotive), effector, non-instigator

Primus' (1999, 48ff.) approach to agentivity is probably one of the best explicated (cf. also Grimm's "agentivity lattice", in: Butt (2006, 87)). Primus has developed further Dowty's (1991, cf. ch. 4.3.2.1) entailments in terms of logical implications. They are given below (with adaption of later notational conventions, cf. Primus (2002)).

- (5a) control (x,s) → cause (x,s)
- (b) control (x,s) → experience (x,s)
- (c) control (x,s) → move (x,s)
- (d) control (x,s) → animate (x)
- (e) etc.

Here the implications among features (entailments) included in the concept of agentivity (proto-agents) are captured in a systematic and consistent way.

The discussion will not be pursued further here. It should have become clear that it is just a matter of a few, but important concepts (cf. also Butt (2006, 86ff.)): causation, volition, intention, control, instigation, motion, their interrelations and the question how fine-grained the distinctions are. Are all these features subsumed under "agent", and is e.g. causation minus control an agent? Questions such as these must be dealt with within the theories to be presented.

In order to have a basis when talking about agents, this work adopts the view of Primus (1999 and subsequent) with respect to the features of agents and the view of Holisky (1987) with respect to the ascription of agentivity to animate effector NPs. (Aktionsarten of verbs, lexical features of NPs and the degree of transitivity are also determining factors (cf. ch. 5 for a more precise discussion)).

Back to split intransitivity: Obviously, agentivity is the decisive, or one of the determining factors with respect to the question whether a verb is unaccusative or unergative, as is shown by the adverbs *intentionally/absichtlich* in (1)-(4). Passivizability is also a factor measuring agentivity (cf. next section). In the above discussion it has been shown that agentivity may be a matter of degree. One would expect, then, that maybe split intransitivity, in case of being governed by agentivity, is also a matter of degree. This is indeed indicated by auxiliary selection phenomena in connection with passivizability. In general, unergatives are considered to take *have/haben*, unaccusatives *be/sein* as auxiliary. One would expect for "maximum" unergative verbs to undergo passivization and to take *have/haben*, and for

“maximum” unaccusative verbs to fail to undergo passivization and to take *be/sein*. Example (6) contradicts this.

(6a) Niemand hat geschlafen.

(6b) ??Hier wurde von niemandem geschlafen.

(7a) Niemand hat getanzt.

(7b) Hier wurde von niemandem getanzt.

Even if someone may have a different intuition about these examples, it seems clear that there are differences in the acceptability of the (b)-examples. While *dance/tanzen* behaves definitely like an unergative, it seems less clear for *sleep/schlafen*, which shows features of both (cf. also Dowty (1991, 605ff.)). Interestingly, (6b) becomes more acceptable with an increase of the heaviness of the Mittelfeld. So *Hier wurde seit Jahren, wenn nicht seit Jahrzehnten von keinem mehr geschlafen* may be a good sentence for many speakers of German.

Zaenen (1988) has shown that in Dutch not only agentivity, but also aspect/*aktionsart* governs the split. Only agentive, atelic verbs are unergatives in her analysis.

	atelic	telic
+ control/+ DO	<i>telefoneren (phone)</i>	<i>aankomen (arrive)</i>
- control/- DO	<i>stinken (stink)</i>	<i>sterven (die)</i>

Table 3.2: Zaenen’s (1988) criteria for split intransitivity in Dutch

This may be valid for English, too. In German, the decision is more difficult, since...

(8) Hier wird nicht ins Becken gesprungen!

or the lyrics of a song of the „Neue Deutsche Welle”...

(9) Ja, ja, ja, jetzt wird wieder in die Hände gespuckt, ...

...indicate, that telic predicates may be unergative in German as well, when agentive. On the other hand there remains no possibility for non-agentive, atelic predicates to be unergatives.

The results are given below (adapted presentation of Dowty (1991, 607) and Zaenen (1988, 11)).

intransi- tives	atelic		telic	
	activity	state	accomp.	achievement
agentive	definitely unergative	presumably impossible	?	?
non- agentive	presumably impossible	definitely unaccusative	definitely unaccusative	definitely unaccusative

Table 3.3: *Presumed distribution of split intransitivity for English and German*

The view of these two factors being operative in split intransitivity has become generally accepted. Van Valin (1990) has claimed having given the first semantic analysis of the phenomenon.³⁵ Since the RRG* analysis of verbs is based on some refinement of Vendler’s *aktionsarten**, van Valin can generalize that very often unaccusative verbs signify achievements and states (lacking “do”-operators) while unergative verbs are activities (having “do”-operators). The crucial factor for the split is agentivity for one class of languages and *aktionsarten* for the other, yet both are involved, generally. (For another quite elegant approach cf. Grimshaw (1990)). For English and German, agentivity seems to be the principal criterion, as the above figure shows in the reading from left to right.

There is one problem left before turning to the passive. Bresnan/Zaenen (1990) distinguish between deep and surface unaccusativity (DU & SU). With DU the argument of an unaccusative is a deep structure object but a surface structure subject. With SU the argument of an unaccusative is a deep structure and a surface structure object. English is clearly a DU-language. In German there are cases of SU. In these cases the only argument does not effect verb agreement:

(10) Mich friert.

The theories presented in chapter 4 all have to deal with the aspects of split intransitivity and agentivity that have been outlined here. It can simply be put this way: How do the theories deal with the fact that there is one syntactic construction – an intransitive sentence consisting of a NP and a V – and two possible corresponding thematic structures?

3.2 Passive/passivization

Consider the active-passive pairs given below:

- | | |
|---|---|
| (11a) Peter küsst den Papagei.
nom/ag acc/pat | (12a) Peter kisses the parrot.
nom/ag acc/pat |
| (11b) Der Papagei wird (von Peter) geküsst.
nom/pat obl/pat | (12b) The parrot is kissed (by Peter).
nom/pat obl/ag |

Pollard (1994)³⁶ gives the following definition for the personal passive that is given in the above examples.

“[I]f a finite active verb takes a referential (i.e. nondummy) nominative subject and an accusative object, then the perfect participle form of the verb together with some form of the auxiliary *werden* [or *bekommen* – S.K.] gives rise to a personal passive construction where the active subject is dropped (or else surfaces as an oblique PP) and the active object surfaces as nominative.”

For now, this is perfectly in accordance with the sentences above. The agent phrase (NP) of the active has become optional in the passive (PP). The task for a theory of thematic roles is at first to explain the fact that there are two fundamentally different syntactic constructions – the active and the passive – and the same distribution of thematic roles – agent and patient. Presumably, the pairs of sentences are approximately synonymous.³⁷ How can this be explained and are there any generalizations possible?

Consider the next pairs of sentences.

- | | |
|---|---|
| (13a) Der Zaun umgibt das Haus.
nom/ acc/ | (15a) The fence surrounds the house.
nom/ acc/ |
| (13b) Das Haus wird (von dem Zaun) umgeben.
nom/ obl/ | (15b) The house is surrounded (by the fence).
nom/ obl/ |
| (14a) Der Papst verdient den Preis.
nom/ acc/ | (16a) The pope deserves the price.
nom/ acc/ |
| (14b) *Der Preis wird (vom Papst) verdient.
nom/ obl/ | (16b) *The price is deserved (by the pope).
nom/ obl/ |

The gaps for the thematic role labels are left open in the above examples. This is due to the difficulties to determine them. Gruber (1965, 34) has already dealt with this problem. If one assumes the traditional definition of theme as the entity moving in the action or event described by the verb (following Gruber (1965) and Jackendoff (1972)), one is forced to

identify the *Zaun/fence* in (13) and (15) as theme rather than the *Haus/house*, since from a paradigmatic perspective it is the surrounding entity that is moving. In (14) and (16) the *Preis/price* seems to be the theme, since it is presumably the entity that is, in a manner of speaking, moving from winner to winner. The other role is location. In (13) and (15) there, then, the theme is preceding the location and allowing passivization. In (14) and (16) the location is preceding the theme, disallowing passivization. The syntactic constructions are identical as well as the lexical features of the NPs and the *aktionsarten* of the sentences. Obviously, passivization must be constrained by a ranking of thematic roles in terms of a hierarchy. In addition, the argument structure of the predicate is reduced by the factor one (so in LFG*-LMT*, RRG*, and others). In the above cases the generalization seems to be that themes are higher than locations and that passivization is possible, in case this is the actual order. Passivization is not possible, on the other hand, whenever the location precedes the theme in active voice.

The above observations contradict Jackendoff's (1972, 43) understanding of passivization fundamentally. He has formulated the first thematic hierarchy and added the Thematic Hierarchy Condition (THC):

(17) Jackendoff's Thematic Hierarchy:

agent > location, source, goal > Theme

(18) Thematic Hierarchy Condition:

The passive by-phrase must be higher on the Thematic Hierarchy than the derived subject.

Additionally, apart from thematic considerations (14b) and (16b) contradict Pollard's characterization of the passive. It fails to make reference to thematic roles, but this seems to be necessary for a definition of passivization. The above discussion concerning the correct ranking of themes and locations has brought about a great amount of literature and long discussion.³⁸ (E.g. Bresnan/Kanerva (1989, 1992), Zaenen (1988), Gee (1974)), Goldberg (1995, 57). This will be reflected upon throughout chapter 4.

The passive resembles unaccusatives in certain respects. There are many theories which analyse the argument of an unaccusative verb as an underlying/initial object (cf. ch. 3.1 and 4). It is trivial to say that the object of an active sentence that may undergo passivization is also an underlying/initial object. But because of the demotion of the underlying/initial subject during passivization in transitive sentences the underlying/initial object (mostly) gets

promoted into surface/final subject position. The same happens with unaccusatives.³⁹ This is the reason why passive sentences cannot undergo passivization again: they are some kind of unaccusatives.

In the previous section it has been shown, that in German there is something like surface unaccusativity, a feature which English lacks. There is a corresponding phenomenon in the passive (cf. (21b) below). Keenan (1976, 328) points out, that dative objects in the active remain in dative case but are promoted to subject position when passivized. This can be doubted, since it does not trigger verb agreement or subject case marking. In addition, it need not move into subject position, as (21b) shows. What follows is that there is no argument that triggers verb agreement. Keenan analyses it as impersonal passive. This fits the comparison with unaccusatives, since demotion but no promotion applies “It is plausible to assume that the demotional properties [of the agent out of subject position – S.K.] are the primary properties of the passive prototype and that the promotional properties [of proto-patients⁴⁰ into subject positions – S.K.] are secondary and optional.” (Primus 1999, 225). One argument for this assumption is the impersonal passive in which no promotion takes place.

(19a) Der Kardinal briet den Papagei.
 nom/ag acc/pat

(19b) *Der Papagei bekam (vom Kardinal) gebraten.
 nom/pat obl/ag

(20a) Der Papst vertraute dem Kardinal.
 nom/exp dat/th/stim⁴¹

(20b) *Der Kardinal bekam (vom Papst) vertraut.
 dat/th/stim obl/exp

(21a) Der Kardinal half dem Papst gestern.
 nom/ag dat/ben

(21b) Gestern wurde dem Papst (vom Kardinal) geholfen.
 dat/ben obl/ag

(21c) Gestern bekam der Papst (vom Kardinal) geholfen.
 nom/ben obl/ag

(22) Gestern bekam der Papst den Papagei (vom Kardinal) geschenkt.
 nom/ben acc/th obl/ag

The question is, then, whether these restrictions are thematically driven. The so-called impersonal passive (e.g. cf. Pollard (1994)) is also closely related to split intransitivity.

Generally, unergatives are considered to be able to undergo passivization. The result of this operation is an impersonal passive. English lacks such a construction. Therefore, only (2c) will be repeated here as (23).

(23) Hier ist getanzt worden.

The personal passive states the same problem as split intransitivity. What is it that prevents unaccusatives from passivization?

To conclude passivization, consider the following sentences.

(24a) The cardinal dropped the parrot into the water accidentally/intentionally.

(24b) The parrot was dropped into the water ?accidentally/intentionally.

Obviously, the passivization of a sentence containing an ambiguous verb with respect to agentivity results in an unambiguous sentence, in which only the agentive reading is present. This may be due to Holisky's (1987) pragmatic principle, but is also a task for thematic role theories.

What is interesting about the relationship between the passive and thematic roles is mainly the question whether passivization applies and how this is restricted. This concerns mainly the argument structures of verbs, which must be organized in a way that captures all of the above data. Important questions are the theoretical relationship between both types of voice (two basic ones or passive derived) and its implications for thematic roles. Beyond these considerations lie interesting case phenomena like those observable in (19)-(22), in which the accusatives and datives show a different behaviour with respect to passivization, the application of the *bekommen*-passive and verb-agreement. (For an overview cf. Butt (2005, esp. ch. 4 & 5 on structural and "quirky"/inherent/lexical case). These phenomena are also involved in the alternations presented in the next two sections.

3.3 Locative Alternation

For a long time, the so-called locative alternation (it alters between direct object position and oblique) has been treated similar to the alternation with the double object construction (mostly called "dative alternation" or "dative shift")⁴², i.e. both sentences (25a) and (b) were

considered synonymous and standing in a derivational relationship to each other (cf. Fillmore (1968, 48)).

(25a) The cardinal loaded bottles on the wagon.

ag th loc/go

(25b) The cardinal loaded the wagon with bottles.

ag pat/th/loc inst/th

Later, it has become widely accepted that the sentences could not be derived from each other because a difference in meaning was detected.⁴³ Pinker (1989, 77) has put this difference in the following way: The locative alternation is

“a rule that takes a verb containing in its semantic structure the core ‘X causes Y to move into/onto Z’ and converts it into a new verb whose semantic structure contains the core ‘X causes Z to change state by means of moving Y into/onto it.’ [...]. [I]n the old verb, the moving thing was the theme and hence was linked to direct object; in the new verb, the location is the theme (of a change of state) and hence is linked to object.”

In the (a) example the bottles are caused to change their state, while in (b) the wagon is caused to change its state. In any case the direct object seems to be the maximally affected argument. Probably due to this affection, there is an aspectual difference detectable. It is widely assumed that in (a) *the bottles* do not completely fill *the wagon*. It is an activity described there. In (b), *the wagon* is completely filled with *bottles*. This has led to the view that there is a holistic (b) reading and a non-holistic one (a) (cf. Jackendoff (1990, 130), Croft (1991, 154), Ackerman/Moore (2001, 3f.), among others). The non-holistic reading can also be called “incremental” due to the invention of the incremental theme (Dowty (1991, 587ff.), going back to Krifka). Dowty analyses the direct object in both sentences as theme but only the theme in (a) as incremental.

“The proposal is that the familiar way in which the aspect of telic predicates [...] depends on their NP arguments [...] can be captured formally by the principle that the meaning of a telic predicate is a homomorphism from its (structured) theme argument denotations into a (structured) domain of events.”

This can be exemplified with the sentence *The cardinal shaves the pope* in which the aspectual status of having shaved is coextensive with the getting rid of hair (presumably) from the popes face. This is complemented by Tenny’s principle (1992, 3), according to which

“[t]he internal argument of a simple verb is constrained so that it either undergoes no change or motion, or it undergoes change or motion which ‘measures out the event’ over time.” This means that it is the direct internal argument that measures out the event in locative alternations (1992, 14ff.). Dowty’s and Tenny’s view contradicts that of Gruber and Jackendoff. According to their definition, *bottles* would be theme in both sentences since it is the argument undergoing movement.

The problem is the following: Is there only one verb *load* with two sets of roles or are there two different verbs? The latter solution seems implausible, according to Carlson/Tanenhaus (1988) who supply psycholinguistic evidence for there being only one *load*. In that case there is one verb with either one or two sets of roles. Suppose there is one set – presumably theme and location – one has to explain why there are different meanings and realizations associated with it. Suppose there are two sets one has to explain why there is the same verb but different thematic roles associated with it. Rappaport/Levin (1986, 19) state with respect to thematic role theories:

- a. The near-paraphrase relation between the two variants must be captured.
- b. The linking of the arguments should be predictable in terms of their θ -roles.
- c. The affected interpretation of the goal as direct argument must be accounted for.”

The captions under (25a) and (b) also indicate the problems of the adequate role assignment. For example, *the wagon* in (b) may be theme as affected entity, or patient as affected entity, or location as the place where the bottles are put. In theories which plausibly differentiate between themes and patients (e.g. Jackendoff (1990, 130) there is the problem that there are consequently two different sets of roles.

The problem with incremental theme approaches to the locative alternation is that this notion is not restricted to direct objects (Dowty) or direct internal arguments (Tenny), but can also appear in subject position. This has already been stated by Dowty (1991, 570) but it does not become evident in the argument selection principles (cf. ch. 4.3.2.1 for further discussion). According to Primus (1999, 43), they even need not remain themes but may become agents if one accepts Holisky’s pragmatic principle. This is the case in *John entered the icy water slowly* or *Die Sonnenstrahlen erreichen die Erde noch zehn Minuten (, bevor der Mond sie blockiert)*.

These are the main difficulties with the locative alternation as it can be found in the great majority of the literature. Nevertheless, Jackendoff (1996) has further complicated the case.

He has pointed out (1996, 346), that the maximal affection of the direct object in the holistic version (b) is just favoured, but not necessary. In other words, *the wagon* need not be full.

As will be shown, the case is not that simple, anyway. Instead, the proposal is that the meaning of these sentences and their aspectual status are crucially depending on two factors: direct objecthood and definiteness. The former has already been discussed. Consider the definiteness of the (postverbal) arguments involved in (25). Obviously they may be definite or indefinite (apart from other quantifiers). There are four possible combinations of definiteness for each sentence, eight in all. They all differ in meaning. Some may be ambiguous, as well. There are, then, more than eight different meanings possible about the sentences in (25) when the factor definiteness is taken into account. This is shown in the table below. The approximate conceptualizations associated with every sentence are also given. Squares represent wagons, lines represent bottles. On the right side “++” indicates definiteness of both postverbal arguments, “+–“ indicates definiteness of the direct object, indefiniteness of the oblique” and so on. “on” refers to the (a) sentences with PPs headed by *on*., “with” refers to (b) sentences with PPs headed by *with*. Opposite to the conceptualizations are their approximate verbal explications.

1. John loads the bottles on the wagons	++ on
Accomp.  (multiple)	Event has an endpoint, when the full quantity of bottles is on a specified quantity of wagons. On every wagon are bottles.
2. John loads the bottles on wagons	+ - on
Accomp.  (multiple)	Event has an endpoint, when the full quantity of hay is on the wagons. Bottle are not necessarily on every wagon.
3. John loads bottles on the wagons	- + on
Activity  // 	Event has no endpoint. An unspecified amount of bottles is loaded on the specified quantity of wagons.
4. John loads bottles on wagons	-- on
Activity   // 	Event has no endpoint. An unspecified amount of bottles is loaded on an unspecified quantity of wagons.
5. John loads the wagons with the bottles	++ with
Accomp.  (//) (multiple) v  (multiple) possible?	Event has an endpoint, when the wagons are completely filled with bottles, or Event has an endpoint, when the specified quantity of bottles is completely loaded on the wagons.
6. John loads the wagons with bottles	+ - with
Accomp.  // (multiple)	Event has an endpoint, when the wagon is completely filled with unspecified quantity of bottles.
7. John loads wagons with the bottles	- + with
?   (/) v    v   v   	Possible concept? Event may have an endpoint, when an unspecified number of wagons is filled with specified amount of bottles. Possibly, event need not have an endpoint.
8. John loads wagons with bottles	-- with
Activity   //	Event has no endpoint. Unspecified quantity of wagons is loaded with unspecified quantity of bottles

Table 3.4: *Approximate conceptualizations of the locative alternation with the parameters “direct objecthood” and “definiteness of the postverbal NPs”*

These are the tasks for theories of thematic roles as part of theories of linking. Some of the aspects of the phenomena presented probably have to be dealt with in terms of a combination of different structures: thematic roles and lexical features of verbs and NPs, as in the eight

sentences above. Furthermore, thematic roles may interact with aspect/*aktionsart* and transitivity. This work is about thematic roles. Nevertheless, it will turn out whether the theories are able to deal with these facts. It is of minor importance to the goals of this work, but will be taken into account as far as necessary. In particular cases, thematic roles cannot be treated independently of such notions.

Indeed, Hopper/Thompson (1980, 262) suggest in their important paper that true transitivity is associated only with the holistic meaning, i.e. with non-incremental meaning of the object, since it is associated with reduced affection. This could be the reason for there being a patient in (25b) but not in (a), because the *wagon* as direct object is not incremental but maximally affected by the action, while *bottles* is not. In German the maximum affection of the object in the holistic version is indicated by a causative-marker *be-* as a verbal prefix. The holistic reading thus contains the verb *beladen* while the incremental reading contains *laden*. This might be an argument for the assumption of two lexical entries.

By the way, with respect to the locative alternation, there naturally has been the same discussion with respect to the rankings of themes and locations as with the passive (e.g. Bresnan/Kanerva (1989, 1992), Zaenen (1988), Gee (1974)), Goldberg (1995, 57).

3.4 Alternations with double object constructions

Consider the following sentences from German and English.

(26a) Peter sendete dem Papst den Grill.
 nom/ag dat/rec/go acc/th

(26b) Peter sendete den Grill an den Papst.
 nom/ag th obl/go/rec/

(27a) Peter sent the pope the grill.
 nom/ag acc/rec/go acc/th

(27b) Peter sent the grill to the pope.
 nom/ag acc/th obl/go/rec

The alternation with double object constructions*⁴⁴ (henceforth: ADOC*) above is another famous example of argument alternations that has long been treated similar to the locative alternation. With the latter it has become clear that the two versions are not synonymous. So far, there is no agreement with respect to this question with ADOC. There is a synonymy

view and a polysemy view on it (terms lent from Krifka (2003)). According to the latter, (a) and (b) sentences are synonymous and the two syntactic constructions are related to each other by movement operations (cf. Larson (1988), and this work, ch. 4.2.5). The other possibility is that both sentences are related to each other by lexical operations (cf. Bresnan (2001)). The monosemy view is associated with one set of thematic roles for both constructions, presumably agent, goal and theme, or agent, recipient and theme.

The polysemy view can prototypically be put as follows: The above (a) sentences can be paraphrased as *Peter CAUSED the pope TO HAVE the grill* while the (b) sentences correspond to *Peter CAUSED the grill TO GO to the pope* (cf. Pinker (1989)). This view clearly implies that there are contexts in which one version is acceptable while the other is not. It is due to the polysemy view on ADOC that there may be different thematic role assignments for the two sentences. The distinction between recipients and goals is important in this respect. The prototypical goal is an object to which some motion proceeds (e.g. Jackendoff (1987)). The prototypical recipient is an animate being that presumably obtains the moving entity (e.g. Goldberg (1995)). According to these types of analyses, the (a) sentences would have recipients, the (b) sentences would have goals. If one agrees with the polysemy view he/she cannot derive one sentence from the other. If one assumes different role sets for the sentences he has to take into account semantic implications of syntactic constructions, e.g. the difference between the dative object and the prepositional object.

One advantage of the polysemy view is that it may capture the fact that with some verbs only the NP-PP construction is possible. There is presumably no verb in the *send*-class that allows the double-object construction and at the same time disallows the NP-PP construction. The reverse relationship is very common.

- (28a) Peter sendete Rom einen Grill. (29a) Peter sent Rome a grill.
 (28b) Peter sendete einen Grill nach Rom. (29b) Peter sent a grill to Rome.

The (a) sentences disallow a reading in which *Rome* does not metonymically denote a/some person/s or institution/s while in the (b) sentences it may indeed denote the city, as well.

Similar restrictions are the following (cf. Krifka (2003), slightly adapted).

- (30a) Peter zog die Kiste zum Papst. (31a) Peter pulled the box to the pope.
 (30b) Peter zog dem Papst die Kiste. (31b) ?Peter pulled the pope the box.

The tasks for the thematic role theories are, then, to provide solutions for the monosemy/polysemy-discussion, the basic-derived-question, the relationship between goals and recipients, and the restrictions that are associated with different verbs.

In a further respect, the ADOC is closely related to the passive-problem. Consider the passives of ADOCs in German and English.

(34a) Der Grill wurde dem Papst (von Peter) gesendet.
 nom dat/rec/go obl/ag

(34b) Dem Papst wurde der Grill (von Peter) gesendet.
 dat nom obl

(34c) Der Papst bekam den Grill (von Peter) gesendet.
 nom acc obl

(35a) The pope was sent the parrot (by Peter).
 nom acc obl

(35b) The parrot was sent to the pope (by Peter).
 nom obl obl

Obviously, the dative in German remains in this case during passivization while in the corresponding English sentence the direct object becomes the subject with all its features: nominative case and agreement with the verb. This indicates the difference between English and German, namely, that the direct object in the double object construction is an accusative in the former, but a dative in the latter. Does this imply any semantic, or, more specifically, thematic differences?

3.5 Psychological verbs

Fillmore (1968, 30; cf. also ch. 4.1.2 in this work) has supplied a first proposal concerning psychological verbs. (Note that the term “psychological verb” in its narrow sense denotes mainly verbs of emotion. This work restricts itself to this narrow definition, due to the lack of space). He recognized a semantic similarity with respect to the verbs *like* and *please*, which has led him to the statement, that they were semantically identical and differed only in the realization of their arguments (see (38) and (39) below). “The verb *like*, in fact, has in its history the subject selection features possessed by *please*.” (1968, 30). Fillmore suggested that

both contain an argument that is animate and somehow affected by the event and an argument that “provoked” this affection.⁴⁵ Such an analysis clearly violates principles like the UAH*, UTAH* and the RUTAH. As will be shown in later sections, Fillmore did not have the adequate instruments to describe this phenomenon. In the late 1960s, however, psychological verbs were taken into view more intensively for the first time. Huddleston (1970, 508) was the first, then, who invented a role solely for those arguments of psychological verbs (in the broader sense including verbs of perception and cognition) that could not be analyzed satisfactorily by traditional Case Grammar. He called it “phenomenon”.

Within the localistic theories headed by Gruber and Jackendoff, there has for a long time been no special treatment of psych-verbs. According to the localistic paradigm the phenomenon was analyzed as a theme that (was) “moved” to a goal (the perceiver) (cf. Jackendoff (1972, 150ff.). Foley/van Valin (1984, 48ff.) analyzed verbs of perception and cognition as “a stimulus of some kind [coming] into contact with a sense organ of the perceiver, and this sets off a complex chain of events in the nervous system of the perceiver.” Verbs of cognition imply to Foley/van Valin (1984, 49) some kind of possession of a cognitive attitude, so that they “have a locative component to their meaning.” In other words, psych-verbs consist of the roles (abstract) location and theme. DeLancey (2000) proposes such an analysis, yet. Even Jackendoff (1990) could not give a satisfactory treatment of them (140, 260). But he has recognized the causative reading of the *please*-class of verbs which long had been analyzed as stative.

During the late 1970s the view has evolved and has become common that psychological verbs take an experiencer and a stimulus or theme role, where theme was a generalization from non-psychological verbs and stimulus was the special role for psych-verbs (e.g. cf. Blansitt (1978)). The invention of stimulus happened on the basis of arguments like those of Marantz (1984, 32) who stated that the object of the *like*-class is neither a real theme (in Gruber’s sense) nor a real patient. An experiencer was prototypically seen as a sentient human being (coming) into some mental state. He was considered to be a reduced agent (cf. Schlesinger (1989, 205), Dowty’s (1991) and Primus’ (1999 and subsequent) proto-agent properties, Butt (2006, 84), among others).

But all these analyses lack an explanation of the fact, that – if pairs like *fear/frighten*, *like/please*, *mögen/ gefallen* have the same thematic roles – they have different syntactic realizations. The recognition of aspectual differences has then led to Croft’s generalization: “Psych-predicates with experiencer subjects must be stative; psych-predicates with stimulus subjects may either be stative or inchoative.”⁴⁶ This rule does not solve the problem since it

fails with respect to the purpose of thematic roles: to capture regularities of the syntactic realizations of arguments. Obviously, here again aspect interacts with thematic considerations. One possibility to escape the problem is the tier-proposal. Grimshaw (1990, ch. 2) assumes an aspectual tier to constrain the linking between the stative and inchoative verb-meanings. So she is able to add causation to the stative meaning (cf. also Dowty (1991, 579-587), Davis/Koenig (2000, 81)). Another possibility is analyzing the *like/fear*-class having experiencer and theme/stimulus roles while the causative *frighten*-class contains an agent and an experiencer (cf. Grimshaw's (1990) agentive psychological verbs). Pesetzky (1995) proposed a rather different analysis. It seems that he tried to code the obvious aspectual differences thematically, by distinguishing target and subject matter instead of using stimulus or theme. The object of the *fear*-class is analyzed as "subject matter" or "target of emotion" while the subject of the *frighten*-class is a "causer". This in fact captures the different realization patterns and is compatible with the UTAH*, but it is rather a doubtful solution since it posits a hierarchy of roles only for psych-verbs.

A contrasting solution is proposed by those who reject a special treatment of psychological verbs completely or in part. Bouchard (1995, ch. 4), e.g., argues against a special analysis of psychological verbs. He argues that they instead behave like any other verbs. Baker (1997, 77ff., cf. also ch. 4.3.2.2 in this work) proposes an analysis in which *fear* and *frighten* are both agent-patient verbs. This radical view might be confirmed by Klein/Kutscher's (2002) analysis. They supply a proposal in which the psychic meanings of verbs from several verb-classes are depending on the fact that they once had had concrete meanings. Their morphosyntactic coding, i.e. their case patterns and argument distribution were thus determined by their physical readings. Suppose this view is accepted, it seems questionable whether there is a consistent treatment of psych-verbs in terms of experiencer/stimulus possible, at all. Consider the following sentences including psychological verbs with their case-pattern, thematic roles (common assignment) and aspectual properties annotated.⁴⁷

- | | |
|--|--|
| (36) Der Papagei gefällt dem Kardinal. | nom > dat; stim > exp; stative |
| (37) Der Kardinal mag den Papagei. | nom > acc; exp > stim; stative, active |
| (38) The parrot pleases the cardinal. | nom > acc; stim > exp; stative, active |
| | ?ag > pat; inchoative, active |
| (39) The cardinal likes the parrot. | nom > acc; exp > stim; stative, active |

	verb-class	aspect	activity	passivization	case pattern	thematic roles	concrete verb-class ⁴⁹
1.	<i>gefallen</i>	stative	non-active	no passive	nom>dat	stim>exp th>?ben	?nutzen, ähneln
2.	<i>interessieren</i>	stative	non-active	no passive	nom>acc	stim>exp th>?loc	?
2.	<i>please₁/</i> <i>ängstigen₁/</i> <i>frighten₁</i>	stative	non-active	?passive	nom>acc	stim>exp th/pat>?loc	<i>berühren</i> ⁵⁰
3.	<i>mögen/</i> <i>like/</i> <i>(?fear)</i>	stative	active	?passive	nom>acc	exp>stim ?ag>th/pt	<i>anfassen</i>
4.	<i>vertrauen</i>	stative	active	passive	nom>dat	exp>stim ?ag>?ben	<i>folgen</i>
5.	<i>please₂/</i> <i>ängstigen₂/</i> <i>frighten₂</i>	inchoative	active	passive	nom>acc	stim>exp ag>th/pat/ ben	<i>töten</i>

Table 3.5: *Classification of psychological verbs*

Every theory of thematic roles must deal with the fact, that there is apparently no unifying feature among these verb-classes, which would allow constraining and restricting any linking possibilities. What seems probable is that activity governs passivization. But what is it that governs case assignment and the distribution of thematic roles?

Which set of roles (Fillmore's, Pesetzky's, Jackendoff's, Grimshaw's, etc.) should be used? Do psych-verbs justify a special treatment?

The rightmost column suggests that there is a concrete, physical reading corresponding to each (except *interessieren*) class of psych-verbs listed here. Does this mean that roles like experiencer and stimulus, subject matter, target of emotion and phenomenon are superfluous?

Psychological verbs seem to be the most difficult subject of thematic role theories. Although aspect and case again stand in some interrelation with thematic roles, these seem to play a crucial role with respect to psychological verbs. Obviously, there are less apparent regularities than has been observed with unaccusatives and passives, for example. Ultimately

in connection with psych-verbs, then, thematic role theories are challenged to prove their usefulness and theoretical significance.

Throughout the foregoing chapter five phenomena have been presented: split intransitivity*, passivization, locative alternation, alternations with double object constructions* and psychological verbs. They all posit particular problems for thematic role theories: from the criteria governing the split between intransitives and that between possible and impossible passivization, to the argument and meaning alternations of the other phenomena, which challenge and seemingly question assumptions that have been held valid most of the time: UAH*, RUTAH, UTAH*.

4. Thematic role theories

In this chapter which is at the same time the core of this work, several thematic role* theories will be discussed with respect to the language phenomena presented in the previous section. Their presentation has been ordered in presumed accordance to the difficulties they may state for thematic role theories. The different solutions (i.e. ch. 4.1 – 4.4) will also be discussed in an order that reflects i) their temporal and ii) their developmental progress, which – most of the time – coincide. The sub-sections also show a particular order, which is due to i) the relationships among the theories with respect to their theoretical contents in order to guarantee maximal coherence, and to ii) their developmental progress, as well.

Due to the high number of theories discussed here it should be clear that their most basic assumptions and characteristics cannot be exhaustively explicated. Instead of this the main concern lies in the discussion of their attempts to resolve the practical problems stated in chapter 3. Therefore, certain knowledge of these basics must be assumed, although some important principles and rules which are subject to discussion will be presented, at least in the notes.

4.1 Discrete role solutions

The term “discrete role”* in this work refers to theories of thematic roles, which assume thematic roles which do not stand in any hierarchical relation to each other, but are discrete. The term also includes what Dowty (1989, 76ff., 1991, 549ff.) calls “individual thematic roles and “thematic role types.” Roughly, the former corresponds to the set of entailments of an argument of a particular verb, i.e. the arguments of the verb *hit* will entail the hitter and the hittee roles, *run* entails the runner role. The latter corresponds to the shared entailments of arguments with respect to a set of predicate-argument pairs, i.e. the agent role with *hit* has approximately the same abstract entailments as the agent of *run*. Discrete role theories are mostly associated with some strict linking principles like UTAH* (not RUTAH, which is rather connected with hierarchy* solutions).

Not all of the theories discussed here have dealt with the entire phenomena presented in the previous chapter. Concerning the most elaborated of these theories, their treatment of the phenomena will be inferred, if possible. In other cases different proposals from within a theory of grammar will be combined to give a complete picture of their dealing with the data.

4.1.1 Aspects, Principles & Parameters, Minimalism

The discussion has to begin stating an exception. As has been outlined in chapter 2, Jeffrey Gruber was the inventor of thematic relations. Although it would be inappropriate to treat him alike with the other thematic role theories, it is a fact that Gruber (1965) has given some statement with respect to some aspects of the phenomena presented in chapter 3. These shall be discussed here, too.

Gruber proposes a localistic theory. This is due to the analysis of thematic roles on the basis of verbs of motion. The roles are thus limited in number and must be applied to non-motional verbs, as well. This is not done exhaustively in Gruber (1965), but has been developed further by others (e.g. Jackendoff (1972), Foley/van Valin (1984)). Thematic roles are derived from prepositions in the “prelexical structure” of verbs⁵¹.

The main idea is that every sentence contains an argument that undergoes some motion, or abstract motion. This is the theme. Given a prelexical string of a particular event that is represented by a motional verb, and change of position or possession. This is further specified by the prepositions FROM and TO in order to indicate that the motion has a source (the next two thematic roles) and a goal. Gruber represents this as follows (slightly simplified):

(1) /send/ in env FROM V, Motion, Possession/Position (TO NP)

This means something like: The phonological string /send/, when mapped onto the (underlined) prelexical specifications, has in its environment a nominal phrase derived from FROM and an optional nominal phrase derived from TO. FROM is obligatorily incorporated, i.e. must not be realized overtly, while (TO NP) is incorporated but must be expressed. In other words, *send* has a theme, a source and a goal.

(2) Peter (source) sends the parrot (theme) to the pope (goal).

But there is obviously an agent present in (2), so (1) must be revised. In its present state, (1) would rather be realized as (3).

(3) The parrot (theme) goes from Peter (source) to the pope (goal).

Agents in Gruber's theory are derived from FROM phrases in the prelexical structure. This is based on the well-known idea that *kill* can be derived from "cause to die". The paraphrase of the prelexical representation of *kill* is given in (4').

(4) The cardinal killed the parrot.

(4') The parrot died [FROM the cardinal.]

Agents are additionally represented in prelexical strings, and there is distinguished between permissive agents (*drop* as *let fall intentionally*) and causative agents (*drop* as *drop intentionally*). So (1) can be reformulated as (5).

(5) /send/ in env C-Agent FROM V, Motion, Possession/Position (TO NP)

The nominal phrase that substitutes FROM will be a source as well as an agent on the surface.

Can Gruber's ideas be applied to split intransitivity. There might be observed a vague suggestion. In Gruber's terms the prelexical paraphrase of unergative would look like (6)

(6) Peter dances

(6') Peter moves [FROM Peter] (in a way that identifies "dancing").

Peter is theme and agent of the movement, which naturally cannot be further specified with Gruber's system. Only if one defines *Peter* also as source, this cannot be captured. (7) might represent an unaccusative.

(7) The parrot dies.

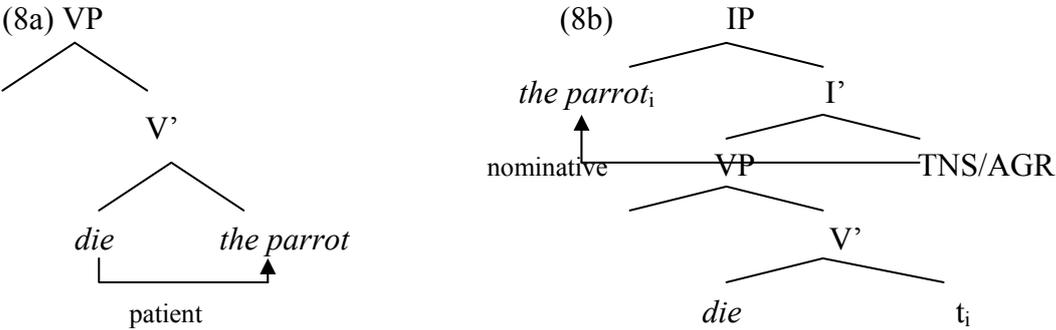
In the prelexical string an optional C-agent would be present in addition to the theme. When it is realized the event becomes *kill*, when it is not, it becomes *die*, presumably.

Passives are treated as in the aspects theory via a transformation. The prelexical string is that of the corresponding active sentence.

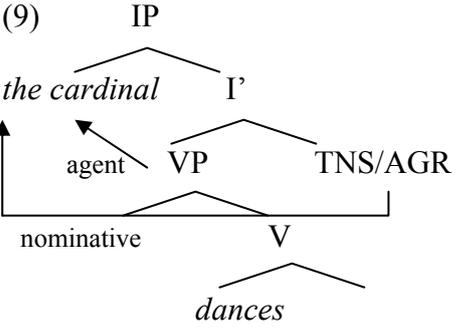
There is no way to describe the argument alternations and psychological verbs. With respect to the latter it can be inferred that the argument being in a mental state would be analysed as location in "durational" or "nondescript" (e.g. Gruber (1965, 38)), i.e., stative verbs and as goal in (abstract) motional verbs.

Although Gruber does not supply a single explanation of the phenomena, there are many suggestions present in his account, which have been further developed in order to explain them. For this preliminary work he deserves to be mentioned.

θ -theory (Chomsky (1981)) is a module within the Principles & Parameters* framework (often called Government & Binding although these are also modules within P&P), which determines the assignment of thematic roles (originally: θ -roles) to arguments. Together with case theory and X-bar theory it supplies a device to explain the linking between syntax and semantics. According to this theory there are verbs which do not assign structural case to their objects, because they lack external arguments (“Burzio’s generalization”, cf. Butt (2005, 62)). So these objects have to move into a position [Spec, IP] where they can receive case, namely nominative case in order to become the subject (Chomsky (1981, 49f.)). Although such a verb cannot assign structural case it assigns a thematic role, theme or patient, to the object before it moves to [Spec, IP]. They are unaccusative verbs. The d-structure and s-structure for *The parrot dies* are given in (8).



In contrast, unergatives receive their thematic role and their case from VP and INFL, respectively, and are generated in [Spec, VP]/[Spec, IP].⁵² The s-structure for *The cardinal dances* is given in (9).



In terms of X-bar, case and θ -theory the passive is a similar phenomenon, where a lexical item, the passive participle, fails to assign structural case (case absorption).

(10) Peter küsst den Papagei.

(11) Der Papagei wird (von Peter) geküsst.

In (11) *geküsst* does not assign accusative case to *Papagei* but only the patient role. Therefore *Papagei* must move into [Spec, IP] in order to receive nominative case. This position is not θ -marked, i.e. empty, so that the moved NP can land there. That means this position need not be occupied by any NP in the passive. This is the case with passivized unergatives in German, e.g. *Hier wurde getanzt*. That this is not possible in English is stated by a parameter.

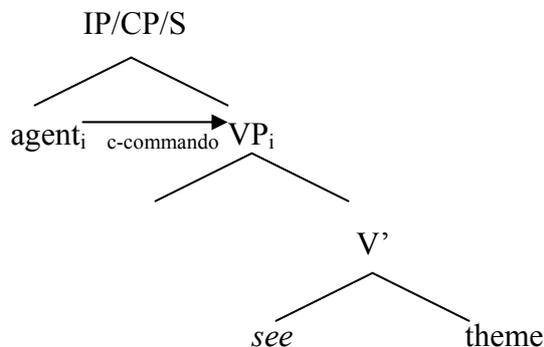
Split intransitivity and passivization can elegantly be captured by the P&P framework when viewed as structural relationships. There are problems remaining concerning the *bekommen*-passive in German which can only be explained in connection with extensive operations on the lexicon or on the system – at the cost of the consistency of the theory. In general, case phenomena (like those in the *bekommen*-passive, associated by possible slight semantic differences between this and the *werden*-passive) are difficult to capture by P&P. Additionally, there is no answer to the question why there is something like the passive, anyway. Further below in this section it will become clear, that one feature shared by lots of the proposals within P&P is the strong claim with respect to the lexicon. E.g. the status of an argument as external or internal depends crucially on its lexical features, not on semantic properties. Therefore, the restriction of passivization and the distinction with respect to split intransitivity are ultimately determined in the lexicon, despite the possibility of the predictability of them.

The other phenomena, i.e. the alternations and psychological verbs, are not that “structural” in kind but involve crucially the notion of thematic roles. Since the classical P&P framework uses the canonical set of roles and makes no statements about aspectual properties of sentences and verbs, the treatment of these phenomena is left up to later approaches. Shortly, the general solution for the ADOC* is to derive the double object construction from that with the prepositional object because of co-occurrence restrictions of the former. This fails to capture those constructions that allow only the former. The locative alternation cannot be explained satisfactorily because of the lack of a distinction between aspectual classes and

holistic vs. incremental objects. The relation between theme and location is also problematic, especially for the UTAH* (theme > location; location > theme). Classical P&P theory making use of discrete roles does not allow a unified treatment of psychological verbs, since their realization patterns also violate the UTAH* (experiencer > theme; theme > experiencer).

Williams (1981a) has proposed an early theory of argument structure within Government and Binding, i.e. the Principles and Parameters framework. In his theory a predicating lexical item consists of a list of the arguments this item can have. This argument structure is part of the lexical entry of a category, verb, for example. The arguments are labelled with the thematic roles actor, theme, goal, source, based on the assumptions of Gruber. The arguments of a verb need not have the same status. Williams (1981a, 83) distinguishes between external and internal arguments. The external argument is defined as located outside the maximal projection of the item of which it is the external argument. The internal argument would be the complement of the head. As a result, the “subject” of that phrase (e.g. a VP) c-commands its “predicate”. The external argument is furthermore indexed with the maximum projection of which it is external.

(12) *see* (agent, theme)



It is important to notice that in this theory thematic roles have no intrinsic content or structure. They only serve to distinguish the arguments of a predicate (Williams (1981a, 86)). The actor is always external, by definition. There are realization rules which are considered to capture all possibilities in a particular language. They are generalizations from the fact that the complements of *kill*, *see*, *hit* etc. are themes. As a result of this abstraction, the rules are verb-independent. Among those for English are the following:

(13) Actor: (NP, PP_{by}) – *John was seen by Bill.*

Actor: (NP, PP_{of}) – *The shooting of the hunters.*

Goal: (NP, PP_{to}) – *to give to John.*

Goal: (NP₂) – *give Bill the book.*

Theme: (NP) – *hit Bill.*

Theme: (NP, PP_{of}) – *deprive Bill of money, speak of something...*

Source: (NP, PP_{from}) – *arrive from Houston.*

X: (NP_{poss})

This can read as follows: If the language English has an argument of the category actor, this is realized as the NP of the PP headed by *by* or as the NP of a PP headed by *of* (for nominalizations) etc. The indices on the categories are prepositions for English, but may also be cases for “case languages” (Williams (1981a, 88)).

Operations that alter the argument structure or yield new argument structures of a lexical item must either be an “externalization” or an “internalization” of one of the arguments.

(14) Externalize an argument of the category X (Williams (1981a, 92)):

E(X): erase the underline on the external argument if there is one, and underline X.

IF X=0, then underline nothing.

(15) Internalize an argument of the category X (Williams (1981a, 99)):

I(X): a. Set the external argument of the input word ‘equal to’ X in the output word;

b. Add a new external argument, A for verbs, R. for nouns.

In terms of Williams’ theory, unergatives would have an external argument, while unaccusatives would lack one. Their lexical entries would be the following:

(16) *dance* (actor)

(17) *die* (theme)

Thus, the solution for split intransitivity is to write the thematic role into the lexical entries of verbs. In addition, the status of an argument – whether it is external or internal – is also a lexical feature of predicates. Actors are by definition external. There is no explanation for aspectual properties, auxiliary selection (which could also be stated in the lexicon), and surface unaccusativity. That split intransitivity is a matter of degree can also not be captured.

The ability of unergatives to undergo passivization is captured by a general rule (Williams (1981a, 94)).

(18) E(\emptyset): erase the underlining in the argument structure giving an argument structure with no external argument.

This is not an instance of E(X), since X is not specified. The “erased” argument in passivization need not always be an actor, so that there must be this additional rule for the passive. The application of E(\emptyset) to *tanzen* is given in (19), the result in (20):

(19) *tanzen* (actor) → *getanzt* (actor)

(20) Es wurde getanzt.

For unaccusatives, there is no possibility to undergo passivization, since they have no external argument. This is, then, the crucial property of the passive. But the operation for (19) does obviously not work for English *dance*. And passives of transitive sentences result in (21) and (22), for example:

(21) *see* (actor, theme) → *seen* (actor, theme)

(22) *It was seen the parrot by the cardinal.

Williams (1981a, 94), however, stated that this is not so bad. When movement applies, the sentence becomes grammatical.

(23) The parrot_{*t*} was seen *t*_{*i*} by the cardinal.

Actually, the problem is that movement must apply here. Williams has stated with respect to sentences like (20) above, that movement must apply only in the cases where a NP is available to move and that movement is not an essential feature of passive. But because the passive participle is considered to fail to assign case, movement must apply. In (20) there is nothing requiring case. Thus, it is all right, for Williams. But English *dance* remains unexplained as well as the whole bunch of thematic restrictions on passive. It is clearly restricted by the presence of an external argument. This need not be an actor in Williams’ theory. There is no criterion to identify an external argument but to stipulate it. In other words: Where passivization is required or obviously possible, the first argument in the lexical entry of that verb must simply be underlined. And the realization rule for the actor in a

passive sentence indicates that the *by*-phrase is treated as a real argument of the construction. But it is clearly an adjunct or what Grimshaw (1990, 109) calls an argument-adjunct.

As has been shown, argument structure alternations must involve the external argument. It follows, that neither the ADOC* nor the locative alternation are instances of argument structure alternations of a lexical item nor do they involve transformations (according to Williams (1981a, 90)). Whether a verb allows goal (NP, PP_{to}) or goal (NP₂) or both is stated in the lexicon. Which one is realized when both are possible? With respect to this question Williams (1981a, 110) has assumed a ranking among both versions: that with prepositional object is the unmarked choice, the double object construction is the marked one. This is valid for all verbs allowing ADOC, and for possibly new invented ones. Unfortunately, there are no reasons given for this decision. It is only certain, that they are not semantic in kind, since both structures as well as the involved thematic roles have no intrinsic semantic content.

The locative alternation cannot be captured by this theory, because of the simple fact, that the number of thematic roles does not suffice or fit the requirements of the construction. In addition, the semantic and aspectual differences cannot be accounted for. This is also true for those psych-verbs, in which aspect seems to be a crucial factor and where the order of arguments differs although there are identical roles present: probably theme and goal, in Williams' terms.

At the time of the publication of Williams' paper, the presumed semantic and aspectual motivation of syntactic phenomena did not play an important role. The main concern was to give a syntactic/structural account for the phenomena. It was thus an advantage of his theory that it did not make any reference to grammatical functions, which turned out to be an additional, maybe redundant factor in linking, when thematic roles, structural positions and external/internal argument-distinction are present. The greatest problem for the theory seems to be that the linking is stipulated in the realization rules. The purpose of thematic roles is to capture generalizations among predicate-argument structures. These generalizations are simply formulated in the realization rules; they are not there by virtue of some semantic generalizations. Nevertheless, and even more important with respect to the history of linking theories, the distinction between external and internal arguments was a great step forward and some time later it became more relevant with respect to thematic role assignment.

Marantz' (1984) concept of role assignment is based on the very same idea of a logical subject generated outside the VP. Because it is similar to the theory of Williams (1981a) in some important respects it will not be presented exhaustively.⁵³ "Choice of object (or other

argument of a verb [subject excluded – S. K.] affects the semantic role of the logical subject whereas choice of logical subject does not affect the semantic role of the object.”⁵⁴ (Marantz (1984, 27)). This is considered to explain some striking subject-object asymmetries in English. E.g. the vast majority of idioms consists of a VP, lacking a subject. Passivization suppresses/demotes/puts *en chômage* the subject, as well as nominalization. A verb thus assigns only one thematic role, another may be assigned by a preposition; the role of the subject is then assigned by the predicate. For split intransitivity this works as follows (cf. Marantz (1984, 35)):

(24) *dance* (Ø)

(25) *die* (patient)

The verb *dance* assigns no thematic role, but the predicate (the VP) consisting of *dance* only assigns the logical subject = agent. *die* assigns a patient role to its object (complement of V⁰) but the predicate [*die* NP]_{VP} has no logical subject. The presence or absence of logical subjects is a lexical feature [+/- log sub]. The lexical entry of a passive participle of a transitive verb has the lexical features *-en* V _____ [- log sub], [- transitive] which determines its grammatical features: The logical subject is demoted and the underlying object cannot be an object anymore, so that the object moves into subject position (cf. Marantz (1984, 126ff.)). The passive morpheme can only be attached to [+ transitive] verbs, so that a passive with *dance* is ruled out. It follows that this is another solution based on a strong lexicon.

Only the ADOC will just briefly be mentioned here. In Marantz’ terms, *send* alters with respect to the role it assigns: goal or theme (cf. also van Valin’s marked undergoer choice, ch. 4.3.1).

(26) *send* (*theme*, goal) or *send* (theme, *goal*), both with [+ log sub], [+ transitive], where italicization indicates the role that is chosen by the verb.

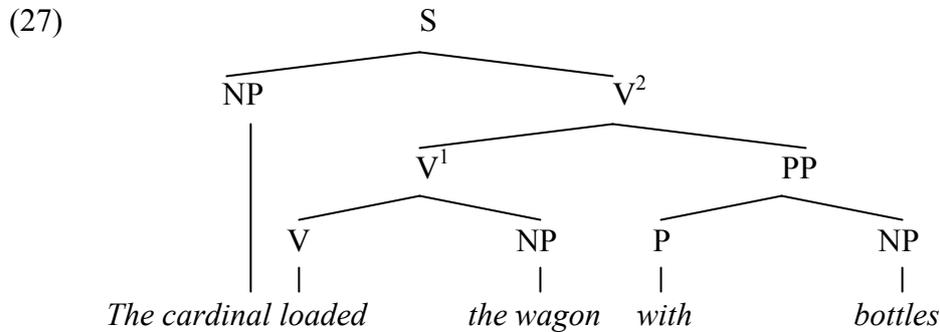
In case *send* chooses theme as its role the preposition *to* will assign goal to the addressee. In case *send* assigns goal to its argument “the theme role will be assigned by the usual expression of direct object, in English, the structural position [NP, VP]” (Marantz (1984, 168ff.)). This fails to capture the restrictions mentioned in chapter 3.4: verbs which allow only one of both versions, possible semantic differences. Apart from that much is done by the lexicon again. This makes it difficult to state semantic regularities, e.g. with respect to the

ADOC*. In addition, role assignment is obviously not governed by a unified principle. Is it predicating lexical items that assign thematic roles, or structural positions? In addition, in Marantz' work two notions of thematic roles are used: what has been called individual thematic roles and thematic role types (cf. Dowty (1989, 1991)). So Marantz (1984, 4) has stated that the object of *like* is neither a theme nor a patient (as role types), but rather the "likee" (i.e. an individual role). A unified theory should be preferred because of the loss of generalization as well as from a methodological point of view.

As the first of the last two theories to be presented in this section the proposal of Culicover/Wilkins (1986, henceforth CW) will be discussed with respect to the locative alternation. CW also modify the P&P framework in some important respects: At first they reject the projection principle (CW (1986, 120)) which (roughly) says that representations at each syntactic level are projected from the lexicon, in that they observe the subcategorization properties of lexical items (cf. Chomsky (1981, 29)). Instead of this, there is no 1:1 correspondence between "logical/semantic requirements of a verb" (CW (1986, 120)). This means with respect to thematic roles, that a "NP may bear a thematic role with respect to more than a single verbal (or relational) argument." (CW (1986, 120f.)). In addition, they operate (like Williams (1981a)) with an external argument/logical subject and predicate⁵⁵ (like Marantz (1984)) with deep grammatical relations A(bsolute), E(rgative)⁵⁶. The grammatical relations are the basis for the assignment of thematic roles (and thus a representation that Williams tried to dismiss from linking). The VP is also modified: There is a VP (V²) in which a smaller VP (V¹) is embedded. The latter contains the strictly subcategorized arguments of the verb which are assigned thematic roles directly (CW (1986, 122)).⁵⁷ The roles are ordered among two tiers, an extensional, consisting of the roles theme, source, goal and reflecting the presumed organization of the human perceptual system. (cf. also ch. 2 in this work). The intensional tier reflects the presumed causal structure of actions with the roles agent, patient, instrument, benefactee. An argument can bear at most one role from each set. This is a rejection of the θ -criterion, according to which "[e]ach argument bears one and only one theta-role, and each theta-role is assigned to one and only one argument." (Chomsky (1981, 36)). The θ -criterion can be said to be the projection principle for thematic roles. Consequently, then, both are rejected. The roles are assigned via rules, mediated by grammatical relations A(bsolute) and E(rgative).⁵⁸

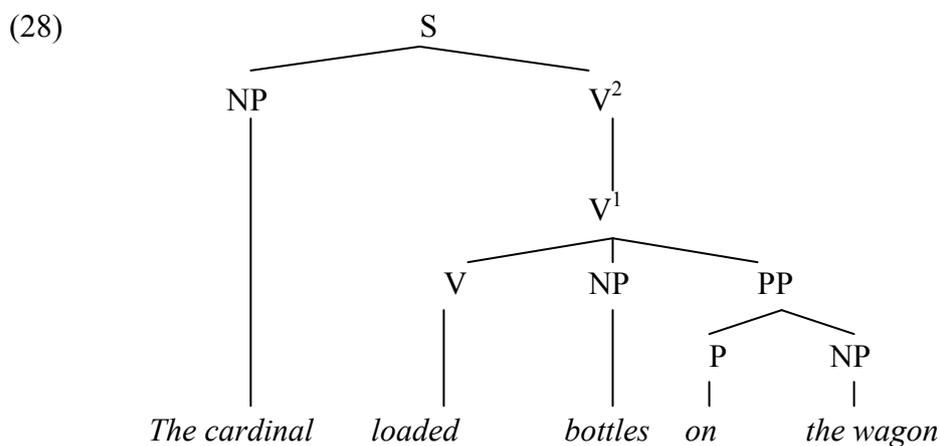
In addition, an r-structure is assumed, which is read-off d-structure, consisting of indices of a NP, its set of thematic roles, and the domain, for which the roles are defined (CW (1986,

124)). Thematic roles are assigned to the representations of constituents in r-structure by coindexing rules.⁵⁹ The first variant of the locative alternation is given in (27) (cf. CW (1986, 128, slightly adapted)).



What is interesting with respect to the present purposes is the assignment of thematic roles. The lexical entry of the verb $load_1$ is *load* (theme/patient) which says that it has only one argument that is assigned a (locational) theme and a (causal) patient. The PP is not strictly subcategorized, *bottles* is assigned (presumably) instrument by the preposition. *The cardinal* is assigned source and agent by the predicate.

The second variant of the locative alternation is given in (28) (cf. CW (1986, 128, slightly adapted)).

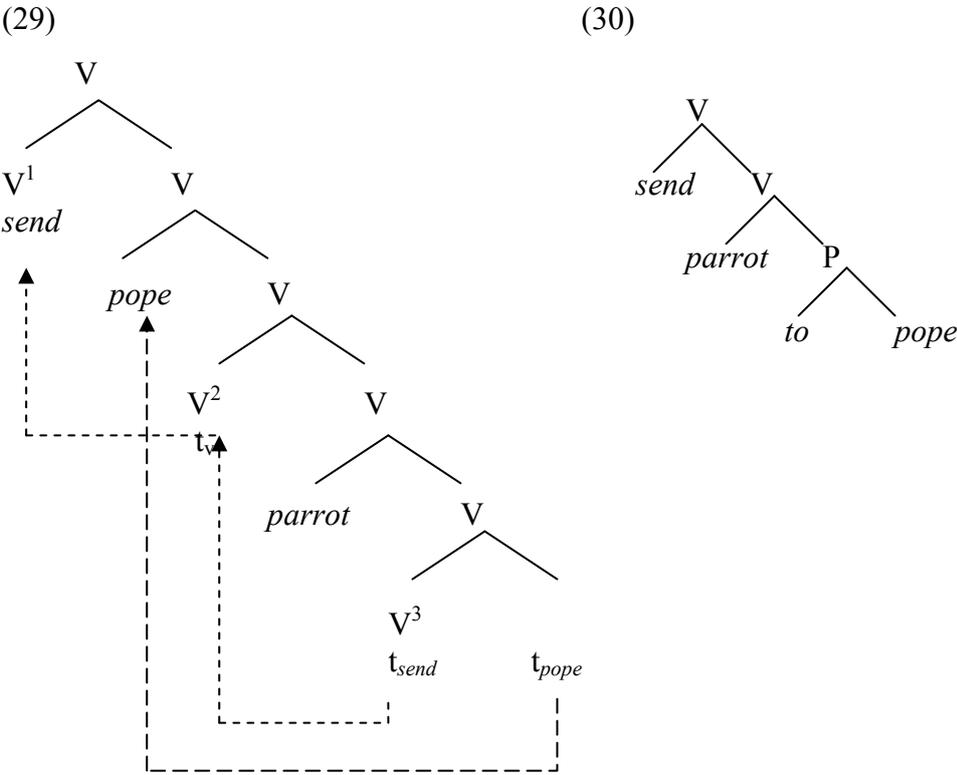


In (28), another verb $load_2$ is present for which a (locational) theme (with presumably no causal role, i.e. *bottles*) and a goal (with presumably no causal role, i.e. *on the wagon*) are subcategorized. Since the direct object is not a prototypical patient, there is no role in the action tier that fits this NP. The same is true for the goal phrase. This nicely captures the fact that (28) reflects the principle of iconicity in that the order of arguments follows exactly the organization of the event in spatial terms. Unfortunately, there are no roles in the action tier,

although one could argue that any event has a causal structure. Only the source is at the same time an agent. In (27), on the other hand, the sentence is organized according to the causal structure, reflected by the agent-patient pattern, which mirrors the “affecter”-affected relationship, while in spatial terms *the bottles* would interfere them; this is shown in (28).

With CW’s (1986) approach, there is, firstly, a problem that there is no satisfactory treatment of the PP in (27) possible, since the thematic structure lacks the appropriate terms. Second, the aspectual differences can only roughly be captured, namely by the application, or non-application, of the patient-role, which cannot replace the distinction between holistic and incremental meanings. (Cf. table 3.4 in ch. 3)). In sum, it might be legitimate to say that CW’s proposal is one of the strongest among discrete role theories with respect to their explanatory power.

Hale/Keyser’s (2007, originally 2002, henceforth HK) work on the ADOC is reflected by their structural representations of the two constructions, (29) for the double object construction, (30) for the prepositional object variant.



As the traces in (29) and the actual order in (30) indicate, the relative order of the theme and the goal are identical in both structures before movement applies. This maintains the possibility of generalizations like a relativized UTAH*. A more detailed discussion of the

ADOC will be supplied throughout ch. 4.2.4 (cf. Larson (1988), to which HK's paper refers). Although their proposals differ with respect to the role of thematic roles, they basically share similar features and problems.

4.1.2 Case Grammar

Fillmore's (1968) case for case was a deviation from the Aspects* theory in Generative Grammar and established Case Grammar*. The major difference was the introduction of cases, i.e. semantic notions, to deep structure. Henceforth they are not called thematic roles but deep cases. Fillmore has stated that, while the case forms of languages differ, what they designate does not differ (Fillmore (1968, section 1.1)). So the possible relationships between a verb and its NPs are the same among all languages, their coding in terms of case forms, on the other hand, is not universal. The possible relationships are captured by Fillmore in deep cases⁶⁰. Deep structure is modified in a way the deep cases have their place in it. The phrase structure rules are formulated as follows (Fillmore (1968, 24, 33)).

(31) S(entence) \rightarrow M(odality) + P(roposition)

P \rightarrow V + C₁ + ... + C_n

C \rightarrow K + NP

...where C stands for deep cases and K for *Kasus*. Each deep case is generated in deep structure with its corresponding K, i.e. a preposition, which the particular C may lose during derivation from deep structure to surface structure.⁶¹ Now deep cases designate participants of a verb. Verbs in turn "are selected according to the case environments the sentence provides." (Fillmore (1968, 26)). They are called case frames. Verbs are then inserted in these frames. In the lexical entries of verbs it is specified in which case frames they can be inserted. The choice of the subject is governed by the subject selection rule:

(32) Subject selection rule for "unmarked" subject choice (Fillmore (1968, 33)):

"If there is an A, it becomes the subject; otherwise, if there is an I, it becomes the subject; otherwise, the subject is the O."

These are the prerequisites to discuss the data. *die* may be inserted into the frame given in (33), *dance* into that given in (34).

(33) *die* + [_____ D]

(34) *dance* + [_____ A]

The selection of the cases is straightforward. (The case of *die* is a D and not an O, since the “dying one” is an animate, affected individual). While the subject selection for unergatives is also straightforward, since they are (prototypical) agentives, the eventuality of the presence of an unaccusative verb cannot be accounted for, since the subject selection rule includes no D subjects. The subject choice should be unmarked with *die*, since that for *open* + [_____ O (I) (A)] is also unmarked with intransitive *open* (Fillmore (1968, 27, 33ff.)). As a result, only the most basic features of split intransitivity, A versus O/D/F/.../, can be accounted for.⁶²

The application of passivization via a feature [+ passive] and the according morphology on the verb allows “marked” subject choice (Fillmore (1968, 37)). In this case, the A in deep structure does not lose its K, i.e. *by*, but rather O/D/F/.../ moves into subject position, resulting in a passive sentence, losing its preposition. This is indicated in (35)-(37) (cf. Fillmore (1968, 35ff., slightly adapted)).

(35) [[past]_M [[give]_V [Ø the parrot]_O [to the pope]_D [by John]_A]_P]_S deep structure

(36) The parrot was given to the pope by John._{surface structure1}

(37) The pope was given the parrot by John._{surface structure2}

There are no statements as to thematic restrictions on passive application, the motivation for a passive, impersonal passives. Additionally, the passive *by*-phrase is clearly a true argument, in Fillmore’s proposal.

In (35) the case frame for *send* is implied: + [_____ O D A]. This is the only entry for *send*, i.e. this should account for the ADOC*. This clearly fails to capture semantic differences among both versions. In order to account for the basic features of the ADOC, one could – as a suggestion – assign the above entry to the double object construction, assuming a D for the “goal”-argument, i.e. the animate receiver, and assign an alternative entry, + [_____ O L A], to the prepositional object version. Though, the phenomenon remains unexplained in most of its features because in the theory there are no means to describe word order alternations, at all.

The same holds true for the locative alternation. For the V-NP-*on* NP-version one could assume *load*_I [+_____ O L A] in order to define the O as moving entity and not maximally

affected, compared to *load*₂ [+ _____ (O) F A] in which *the wagon* is maximally affected, i.e. a F, while *the bottles* are again the (this time optional) moving O. But this is also only a suggestion with respect to the semantics of the locative alternation. Since O and F are considered to have zero prepositions, this clearly does not work with *load*₂ which requires *with*.

Due to the fact that psychological verbs crucially involve subject-object alternations and presumably the D deep case, which does not occur in the subject selection rule, a treatment of them will not be attempted here. Although, there are obviously some severe problems for the theory, which has been criticized a lot, there are also some remarkable ideas in it (cf. Huddleston (1970), Carter (1976), Fillmore (1977), Jackendoff (1990), van Valin (1996), Talmy (2001) for criticism). For example the idea that the deep cases are associated with particular prepositions, which are deleted when movement applies, can nicely capture some regularities. And although the fact that the definitions of the cases are often too vague and have been criticized, the formulation “perceived instigator” (Fillmore (1968, 24)) indicates a crucial criterion for determining agent(ive)s (cf. also Holisky’s (1987) pragmatic principle, ch. 5 of this work). Although the subject selection principle does not work, there is the first thematic hierarchy implicit: agentive > instrumental > objective. Fillmore has also formulated an early θ -criterion: only one case per NP.

In Fillmore (1977) many ideas of the “case for case” were further developed based on rich criticism. From this paper grew Construction Grammar*, which will be dealt with in ch. 4.2.2 (cf. Goldberg (1995)).

4.1.3 Relational Grammar

Relational Grammar* as it is discussed here is in a sense a theory contrary to thematic analyses of the phenomena presented in chapter 3, although they are used. Anyway, it will not be discussed exhaustively here. Rosen (1984, 40) has formulated the UAH* firstly in favour of a notion like thematic roles: “There exists some set of universal principles on the basis of which, given the semantic representation of a clause, one can predict which initial grammatical relation each nominal bears.” This resembles in important respects the definition of the purpose of thematic roles given in ch. 2.2, apart from the significance of “initial grammatical relations”. But after having “tested” it, Rosen has rejected the UAH. The rejection is based on cross-linguistic data concerning the alignment between lexical semantics of verbs and the distribution of the grammatical relations of these verbs. The result is that one

cannot predict the initial grammatical relations from the semantics of the verbs and thus the UAH is “untenable” (Rosen (1984, 61)). Instead, a rather descriptive syntactic analysis is supplied with the crucial involvement of primitive* initial grammatical relations $1 > 2 > 3 >$ non-terms, where the integers correspond roughly to subject, direct object, indirect object, obliques/argument-adjuncts. Sentences undergo several operations in which the distribution of terms changes, e.g. passivization, which is modelled in terms of arcs and strata. In RG there are a lot of rules and laws formulated in order to capture generalizations with respect to language phenomena. One part of the Unaccusative Hypothesis is given below (cf. Perlmutter (1983, 151)).

(38) Intransitives:

“A stratum is unergative if and only if it contains 1-arc and no 2-arc. A stratum is unaccusative if and only if it contains a 2-arc and no 1-arc.”

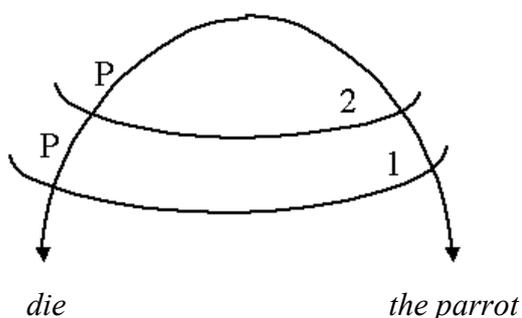
This rule does not make any reference to thematic roles. Rather, unergatives are defined to have an initial (and thus a final) 1, while unaccusatives have an initial 2 and a final 1, according to another law (cf. Butt (2005, 35)).

(39) The Final 1 law:

“Every basic clause must have a 1-arc in the final stratum.”

In other words, all sentences must have subjects. The representation of an unaccusative is given below.

(40)



An unergative would have only one stratum containing a 1. The distribution of grammatical relations with the ADOC* and its corresponding passives is given in the table below:

NP/construction	double object	prepos. object	passive ₁	passive ₂
<i>the cardinal</i>	1	1	<i>chômeur</i>	<i>chômeur</i>
<i>the parrot</i>	2	2	1	loc
<i>the pope</i>	3	loc	1	2

Table 4.1: *The ADOC and its passives in RG*

With respect to the treatment of split intransitivity, the ADOC and the passive, it becomes clear that RG is mainly designed to describe generalizations instead of explaining them adequately (in the sense of Chomsky (1957, chapter 8)). Consequently, this will not be pursued further here. Although there are no means of giving structural or semantic explanations for the phenomena discussed here (i.e. the questions asked throughout ch. 3), some theorems of RG have become famous, in part due to their early formulations and universal applicability: e.g. the Unaccusative Hypothesis and the characterization of the passive in terms of initial grammatical relations.⁶³ Because of this, RG is mentioned here.

4.1.4 Cognitive Grammar

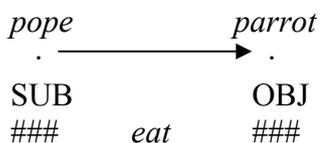
Croft (1991, 156f.) rejects the three criteria of what he calls a “reductionist” approach to thematic roles. According to this thematic roles are primitive notions, they are defined independently of verbal semantics, and there is only a small set of roles. Instead of this there must be a decomposition approach in terms of a causal structure and verbal semantics are crucially involved in such a conception. “[V]erbal semantics is quite structured and [...] only certain crucial aspects of verbal semantic structure are relevant to surface case marking.” (Croft (1991, 159)). These aspects are analysed as the causal structure of events. Thematic roles are hence defined according to the above “certain aspects” of verb meanings. Which are these aspects? The “encoding of what human beings perceive and consider to be individual events. [V]erbs reflect segments of causal structure.” (Croft (1991, 161)). How do causal structures look like? Causation is considered to be individuals acting on individuals, including “transmission of force” which determines which individual comes first in the event structure and which comes last. In short, linguistic structures shall reflect cognitively real structures. What are the primitives of causal structure? They are determined by the conceptualization of events, because

“the speaker may have decided what he is going to talk about, [...] and that determines the way in which he will express the predication. Or, the speaker may already have an event in mind that he

wishes to report, its level of granularity already determined, and that in turn determines the level of granularity of the arguments to the predicate denoting that event.”

Based on Lakoff’s idealized cognitive model Croft proposes a very complex causal event structure.⁶⁴ Because of its complexity (due to the complexity of human experience) it “must be simplified into verbs and thematic roles.” And this is identical with argument structure. Building on Hopper/Thompson (1980) Croft assumes a prototypical event structure, into which other events must be “coerced” into. Prototypical is the presence of maximal transitivity which in turn depends on volitional causation. A causal chain can be segmented, and subject and object serve as boundaries of segments, initiator and endpoint, respectively. Cf. (41):

(41) The pope ate the parrot.



· = boundary of atomic event
 → = event, action on
 # = segment delimiter

What is the function of thematic roles? There are again two tiers (like in Culicover/Wilkins (1986)), the first consisting of oblique roles (Croft (1991, 176ff.)) They serve to order the participants in the causal chain, relative to subject and object.⁶⁵ The direct roles in the other tier become subject or object, which is dependent on the choice of the verb and its voice.⁶⁶ The choice of subject and object are crucially dependent on the way an event is conceptualized. The content of thematic roles is dependent on the possible causal chains and causation types, and therefore universal.

Like RG, the account of Croft is rather descriptive.⁶⁷ This means, his proposal does not adequately serve to restrict the possible grammars of a language. Although thematic roles are well defined here (according to the cognitive organization of events) compared with many other theories which use rather indefinite sorts of knowledge to determine thematic roles, they are of limited explanatory value. What does restrict the application of passivization and what does prevent the agent from being an argument in the passive? Why does *Peter stirbt* describe an “endpoint of an act of physical causation” (i.e. the definition of patient)? It seems that the theory fails to recognize that a 1:1 correspondence between cognitive structures/the cognitive representation of the organization of perceived event structures and grammatical structures is not possible. There are regularities that cannot be referred to cognition alone. E.g., are there any sufficient cognitive criteria that may explain why *der Papst schlug ihm den Kopf ab* has a

dative object as well as *der Kardinal folgt ihm*. Which cognitively relevant aspect do the two datives have in common? With respect to the locative alternation one could state that *The cardinal loads the wagon with bottles* can perhaps be captured nicely by an analysis in terms of a causal structure, but *The cardinal loads the bottles onto the wagon* seems to be rather suited for a locational analysis, since the arguments are ordered according to the spatio-temporal organization of this event, not to the causal structure. There is a non-incidental iconic relation between the spatio-temporal and the syntactic structure. Finally, the definition of experiencer and stimulus completely fail to recognize the problems of psych-verbs. Why does the pope in *the pope doesn't like the parrot* represent the endpoint of an act of affective causation?

A remarkable proposal is given by DeLancey (2000). He argues that it has been the problem of most of the theories of thematic roles that they have made unnecessary distinctions between case roles (DeLancey (2000, 7) referring especially to Case Grammar*). He states that there are no languages which have more than three core arguments and presumably all share the same inventory of clause types. These are given in the left of the two tables below. On the right there are only three necessary roles given, with their distribution with respect to the clause types.

	A: monovalent	B: divalent	C: trivalent
1.	unergative	change of state	ditransitives
2.	unaccusative	surface-contact	
3.		exp-subject	

Table 4.2: DeLancey's (2000, 6) predicate types

agent	theme	location
subj. of A1	subj. of A2	subj. of B3
subj. of B1,2	obj. of B1,3	obj. of B2
subj. of C	'patient' of C	'recip.' of C

Table 4.3: DeLancey's (2000, 7) environments for thematic roles

This patterning is considered to capture such generalizations that one can find “the same case-form marking a Recipient, and Experiencer, and the object of some but not all transitive verbs.” (DeLancey (2000, 7)). The roles remain undefined, they are rather “occurrence”-prototypes with respect to the presumably universal predicate types.

In the above tables the solution for split intransitivity is already indicated. Unergatives have agent arguments, unaccusatives have theme arguments (note that agents are problematic according to DeLancey (1984)). The former can be defined – with reference to DeLancey (1984) – as volitional causers. However, this fails to capture the degree of membership, the involvement of aspect on the semantic side. DeLancey makes no statements about a syntactic

representation, so criticism concerning syntactic operations will be left out. The same holds true for passivization, for which no thematic restrictions can be formulated, also with respect to the impersonal passive. The ADOC is treated as discourse-pragmatically driven (DeLancey (2000, 9)). The resulting monosemy-view ('cause NP to go to NP') is untenable (cf. ch. 3.4). The analysis of the locative alternation is also problematic. The *wagon* as direct object is analysed as theme, the with-phrase is not subcategorized. The *bottles* as direct object is also a theme, the *wagon* being location. Additionally, DeLancey (2000, 10f.) claims that every location needs a theme and reverse (similar to figure and ground in Talmy (2001)). That means some implied AP *full* is abstract location in the former version of the locative alternation. If Jackendoff's (1996) arguments and the analysis given in table 3.4 in this work are valid, then the holistic reading, i.e. the "result phrase", is not necessarily present, but only a tendency. Experiencers are also abstract locations. If psychological verbs include only locations and themes, the different patterns (reflecting aspectual differences as well as thematic and case differences) cannot be accounted for.

Nevertheless, the idea underlying the paper is appealing, since number and content of thematic roles can be defined on solid grounds – universal clause patterns and cognitive "units" (theme and location as figure and ground). Unfortunately, the criticized "overdifferentiation" (DeLancey (2000, 7)) has undoubtedly been replaced by an "underdifferentiation".

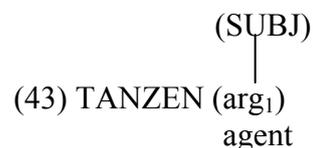
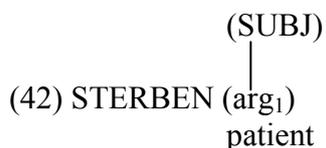
4.1.5 Head-Driven Phrase Structure Grammar

Head-Driven Phrase Structure Grammar* has not been primarily designed as a grammar containing a theory of linking, but rather to supply a computational theory of an abstract lexicon. Nevertheless, there are accounts to predicate-argument structures. Some of them, like Pollard (1994) and Heinz/Matiasek (1994) do not make use of thematic roles, at all. Wechsler (1995) and Pollard (1987) use discrete roles* in the sense of individual thematic roles. This shall be mentioned here for reasons of completeness, although the latter two will not be discussed here. This work is based on a conception of thematic roles that is incompatible with individual thematic roles because they express a concept that is the opposite of the original purpose of thematic roles: generalizations among relationships between predicates and arguments. These generalizations are given up along with individual roles, since there are as many roles as there are possible arguments of verbs (cf. Dowty (1991, 548ff.) and the discussion of Marantz in this work; ch. 2.2 in this work).

4.1.6 Lexical-Functional Grammar

Early LFG* is characterized by the lack of an explicitly outlined argument structure (as a discrete representation) which was incorporated some years after its invention at the end of the 1970s (cf. ch. 4.2.3). LFG rejects transformations and assumes only one syntactic representation, i.e. it is monostratal. The capturing of generalizations is considered as supplied by a large lexical component. This is accompanied by a language-specific constituent structure and a universal functional structure which operates on the generated c-structures. Like in RG*, grammatical functions are considered to be universals of language. They are lexically assigned to the arguments of predicates which are expressed in the lexicon in terms of thematic roles. They are mainly those assumed in Chomskyan theories. Both are unified then in f-structure. Regularities in the mapping between semantic arguments of predicates and syntactic structures are captured by the interplay of thematic roles and grammatical functions. The terminal nodes in c-structure are associated with the corresponding f-structure attribute-value matrices via functional indices. Several wellformedness-conditions apply to the functional description, which supplies grammatical sentences. (For an outline of early LFG cf. Bresnan (1982a)).

Split intransitivity is thus a matter of the lexical assignment of grammatical functions to the argument structure of the verb.



In the lexical entries of unaccusatives and unergatives it is specified that they have only one argument and also, which thematic role is associated with this argument. In this case lexical assignment of grammatical functions to argument structures applies. Auxiliary selection is determined in lexical entries, too. The question whether a given passive sentence of an unergative is possible or not may be a matter of a wellformedness-condition on the functional description of this sentence. So the English **It is danced here* is ruled out while German *Hier wird nicht getanzt* is wellformed. Passivization is – according to the basic principles of LFG – not a transformational or movement operation, but a lexical one. It is governed by a rule (cf. Bresnan (1982b, 9f.)).

(44) Effect of passivization on a lexical form:

$$L(\text{SUBJ}), (\text{OBJ}) \rightarrow L(\text{OBL}/\emptyset), (\text{SUBJ})$$

agent theme agent theme

L in (44) represents a given verb in the active and its corresponding participle in the passive. Restrictions on the wellformedness of a passive are again a matter of some constraint. *send* can occur with two sets of functions assigned as it is indicated below. The corresponding dative-shift rule is also given (thematic analysis adopted from Bresnan (1982b, 26f.)).

<p>(45a) SEND</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(SUBJ) (OBJ₂) (OBJ)</p> <p> </p> <p>(arg₁), (arg₂), (arg₃)</p> <p>(source)(theme)(goal)</p> </div> <div style="text-align: center;"> <p>(45b) SEND</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(SUBJ) (OBJ)(to OBJ)</p> <p> </p> <p>(arg₁), (arg₂), (arg₃)</p> <p>(source)(theme)(goal)</p> </div> </div> </div> </div>
--

(46) Dative-shift rule (Bresnan (1982b, 25)):

(OBJ) → (OBJ₂)
 (to OBJ) → (OBJ)

Although there are two sets of grammatical functions associated with *send*, there is only one verb *send*, which alternates only with respect to the lexical assignment of grammatical functions to its arguments. Since the thematic structure remains identical this is a monosemy view to the ADOC* which fails to capture (or to accept) semantic differences. Rather, the alternation could be motivated information-structurally. In fact, (45a) is derived from (45b), but the reason for this is not clear. This assumed relationship (as well as for active and passive) is identical with that of the P&P account (cf. further above in chapter 4.1.1). Only the movement account was changed into a lexicalist approach to these phenomena.

It seems that in early LFG there is no fixed set of thematic roles. So one could differentiate between themes and patients (what Bresnan (2001) in fact does), and one could capture thematic and subcategorization differences with respect to the locative alternation. But while *send* is analysed above as one verb, there must probably be two verbs *load* assumed.

<p>(47a) LOAD₁</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(SUBJ)(OBJ)(on OBJ)</p> <p> </p> <p>(arg₁), (arg₂), (arg₃)</p> <p>(agent)(theme)(location)</p> </div> <div style="text-align: center;"> <p>(47b) LOAD₂</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>(SUBJ)(OBJ)</p> <p> </p> <p>(arg₁), (arg₂)</p> <p>(agent)(patient)</p> </div> </div> </div> </div>
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Alternatively, one could assume another lexical rule according to which (47a) was the basic version with respect to the (b) example. Then (on OBJ) → (OBJ) and (OBJ) → (with OBJ/∅)

would be the rules deriving the divalent from the trivalent sentence. This latter solution seems not very convincing, since firstly the rule has no great generality (e.g. *put* NP1 *on* NP2 but **put* NP2) and, secondly, in German there are indeed two verbs: *laden* and *beladen*. Beyond there being a patient in one but not in the other version, aspectual differences are not dealt with.

Since LFG does not make use of locational decomposition, with reference to which one could analyse experiencers as locations, there is no possible treatment of psychological verbs. Even if one introduced the role experiencer and stated differences (e.g. between *fear* and *frighten* and *gefallen*) among psych-verbs in the lexicon, there would be the same problems as with the other phenomena. Most of the generalizations cannot be captured because of the conception of the lexicon in which the lexical features of predicates are stipulated but not derived or drawn from their semantics. Because of the shape of the lexical component and the functions it takes up in the theory LFG resembles HPSG* in one respect: Both are open to different conceptions of thematic roles. In LFG there is at least one account which makes use of individual thematic roles (Levin (1982)). In the late 1980s LFG was extended with respect to the syntax-semantics interface. It was recognized that the lexicon was “overloaded” and that the theory required a device to constrain the relationship between grammatical functions and thematic roles. This has come to be known as Lexical Mapping Theory* which much strengthened the theory with respect to its explanatory power (cf. ch. 4.2.3).

Obviously, several characteristics can be made out concerning discrete thematic role theories. First, apart from Fillmore (1968) and part of Jackendoff’s work, the linguistic research of the 1960s, 1970, and in part the 1980s was to a large extent influenced by the “syntactocentrism” (term taken from Jackendoff) of the Chomskyan tradition. Compared to stages to come the theories in these decades have hardly made any reference to semantics as a determining factor for syntactic structures.

Second, in these theories discussed above the lexicon is charged with numerous sorts of information at the cost of generalizations that could be made on the basis of the semantic features of predicates or arguments. So the application of passivization, for example, is either not restricted at all (e.g. in Case Grammar*) or ill-formed passives are ruled out by wellformedness-constraints (e.g. in LFG*), or it is derived from some syntactic property of predicates, which though can be traced back to some lexical stipulation (Williams’ (1981a). external argument). This may be a result of the above-mentioned long standing “syntactocentrism”.

Third, although thematic roles have been invented as semantic notions in order to generalize predicate-argument structures, they were not used to predict syntactic structures but rather to simplify the semantic interpretation that is derived from syntax. Several researchers, however, have abandoned this tradition and questioned the claim that syntactic constructions could be explained without reference to semantics.

Thus we must ask ourselves which improvements must be supplied to discharge the lexicon and instead of this to formulate generalizations in the mapping of semantic arguments into syntax? Fillmore (1968) has put forward an idea that later served for decades as a solution to these problems (cf. figure 2.4 in ch. 2). He has observed that in the presence of an agent an instrument cannot be the subject of the sentence. And in the presence of an instrument a theme or patient cannot become subject. What implications does such an observation bear?

4.2 Thematic role hierarchy solutions

Fillmore (1968) found out that, with respect to the question which argument shall and can become the subject of a sentence, not all thematic roles are created equal. Then, he was the first who recognized that the relationships among the roles are not incidental. There are relations of prominence not only between an agent and an instrument, but also between an instrument and a theme or patient.⁶⁸ Although this has not been formulated by Fillmore, the following hierarchy* among thematic roles is implied by his subject selection rule.

(48) agent > instrument > theme/patient

Defining the prominence among these allows predicting some syntactic regularities, especially determining the distribution of subject and object, structural positions or morphological case. Hence, while using a thematic hierarchy one could hope to find a homomorphism between the prominence among arguments in the semantic representation and the prominence among arguments in the syntactic representation.

4.2.1 Jackendoff (1972 and subsequent)

The first explicit thematic hierarchy* can be found in Jackendoff (1972, 43), based on Gruber's (1965) list of thematic roles (cf. also ch. 3.2):

- (48) The Thematic Hierarchy:
1. Agent
 2. Location, Source, Goal
 3. Theme

Based on this hierarchy, Jackendoff (1972, 43) has formulated a “Thematic Hierarchy Condition” (THC)⁶⁹:

(49) Thematic Hierarchy Condition

The passive by-phrase must be higher on the Thematic Hierarchy than the derived subject.

In chapter 3.2 it has already been shown that the functioning of the THC depends crucially on the thematic analysis of the arguments in a sentence. In those containing verbs like *umgeben/surround* and *verdienen/deserve* it is not clear which roles their arguments bear. If one analysed the subject of both as theme and the object as say, location, then the THC is violated, although the result is a grammatical sentence. In other words, the THC does not work.

- | | |
|--|---|
| <p>(50) Der Zaun umgibt das Haus.
 theme location</p> | <p>(50') Das Haus wird vom Zaun umgeben.
 location theme</p> |
|--|---|

(THC: agent > location, source, goal > theme)

That the thematic analysis in the examples above may also be indicated by the fact that in terms of figure and ground, *Zaun* is clearly figure, and *Haus* is clearly ground in both sentences.⁷⁰ This result is also confirmed by Gee (1974) and has given rise to a discussion that lasted until the 1990s (e.g. cf. Bresnan/Kanerva (1989, 1992)).

The use of thematic roles in Jackendoff’s theory is only a convenient way to make generalizations like the THC. Actually, they are no primitive notions in his theory but – and that is what makes Jackendoff’s work so important – derived from the positions in locationally and causally decomposed structures.⁷¹ This concept has been worked out with major steps in 1983, 1987, and 1990. Thematic relations, only defined formally in 1972, became a conceptual notion later through their implementation into the conceptual structure (CS) of the grammar (cf. Jackendoff (1987, 374ff.)). The locational decomposition was redefined in terms of (innate) conceptual categories formed by formation rules.⁷²

Accordingly, a theme is the first argument of the functions GO, STAY, BE, ORIENT, source is the argument of FROM, goal of TO. Instigator is the first argument of CAUSE, the second is effect, a rather exceptional role. Experiencers remained to be worked out. What can be said is that they were not identified with locations (like in Foley/van Valin (1984)).⁷³ Additionally, Jackendoff (1987, 394ff.), building on Culicover/Wilkins (1986, cf. ch. 4.1.1), has introduced an action tier (agent-patient relations) besides the thematic tier (location and motion).⁷⁴ The action tier consists of an actor (i.e. a similar concept to van Valin’s (1996) effector) “acting on” an optional patient. A volitional actor is an agent; an animate actor is ambiguous (but presumably subject to Holisky’s (1987) pragmatic principle.

Arguments in the conceptual structure are indexed, substituted and “fused” with syntactic constituents that fit lexical requirements.⁷⁵ What follows immediately is that there are arguments in the conceptual structure that bear more than one thematic role, being a rejection of the θ -criterion and its derivatives.⁷⁶ It also follows that there are arguments in CS that have no corresponding syntactic argument like the thing BUTTER in the EVENT-function of the sentence *John buttered the bread*.

The thematic hierarchy in Jackendoff’s later work (here: 1990, 258) is based on this conceptual structure. It is given below (slightly simplified):

- | | | |
|------|---------------------------|--------------------------------------|
| (51) | a. [AFF (X, ... | (Actor) |
| | b. [AFF (... , Y) | (Patient (AFF-), Beneficiary (AFF+)) |
| | c. [EVENT/STATE F (X, ... | (Theme) |
| | d. [PATH/PLACE F (X)] | (Location, Source, Goal) |

Peter in *Peter died* is the argument of an unaccusative verb. This verb presumably has a lexical entry in Jackendoff’s (1990) theory with the following (simplified) features:

- | | | |
|---|---|---|
| (52) | <table border="1" style="border-collapse: collapse; width: 100%;"> <tr> <td style="padding: 5px;"> <p><i>die</i></p> <p>V</p> <hr style="width: 20%; margin: 5px auto;"/> <p>[EVENT GO ([THING ()]_i [PATH FROM ([ALIVE]) TO ([DEAD]])]</p> <p>[AFF⁻ (, [Y]_i)]</p> </td> </tr> </table> | <p><i>die</i></p> <p>V</p> <hr style="width: 20%; margin: 5px auto;"/> <p>[EVENT GO ([THING ()]_i [PATH FROM ([ALIVE]) TO ([DEAD]])]</p> <p>[AFF⁻ (, [Y]_i)]</p> |
| <p><i>die</i></p> <p>V</p> <hr style="width: 20%; margin: 5px auto;"/> <p>[EVENT GO ([THING ()]_i [PATH FROM ([ALIVE]) TO ([DEAD]])]</p> <p>[AFF⁻ (, [Y]_i)]</p> | | |

For an analysis in terms of conceptual categories based on a localistic decomposition it is quite difficult to capture an event like dying. But what is crucial is the action tier: The argument of *die* is a patient. Below the lexical entry for *dance* is given:

$$(53) \left[\begin{array}{l} \textit{dance} \\ \text{V} \\ \hline [\text{EVENT GO}_{\textit{dance}} ([\text{THING } ()]_i, [\text{PATH ALONG } ([\text{FLOOR}])])] \\ [\text{AFF } ([\text{X}]_i)] \end{array} \right]$$

The argument of *dance* is an agent. This event is also difficult to capture due to the structure of the action described by the verb. So the representation of the thematic tier in (53) is only approximate. Although Jackendoff's (1987, 1990) CS makes fine-grained distinctions that are unrivalled, there are remaining problems. There are no means to determine the gradience of membership in either unaccusative or unergative verb classes. Auxiliary selection must be further specified as a syntactic property of a lexical entry.

The passive (in Jackendoff (1990)) applies in terms of the deletion of the index of the appropriate argument in CS. So this argument cannot be linked into syntax, but remains implicit, since it is present in CS, yet. Passivization is restricted by the presence of an action tier in which the first argument (AFF ([X], ...)) is present, i.e. an external argument (Jackendoff (1990, 180); this depends on a test: An actor can appear in a frame *What X did (to NP) was....*. The problem is not the thematic hierarchy, as it was in 1972, but rather this test:

(54) The house was surrounded by the fence.

(54') ?What the fence did was surround the house.

It is obvious that there is an actor or effector-theme present in (54) which allows the sentence to undergo passivization. This is not correctly predicted by Jackendoff's test. Already Cruse (1973) has pointed out that the *do*-test is not without problems. This may be an aspectual problem (the *do*-test allows only active verbs), but the theory does not account for it. Another aspect of this problem is indicated by the following pair of sentences (taken from Cruse (1973)).

(55) Christ died for us.

(55') What Christ did was die for us.

(55'') *It was died for us by Christ.

This is a problem of the definition of agentivity and how it is assigned to NPs. Anyway, the treatment of the passive remains problematic, apart from the fact that the THC of 1972 (cf. (48)) was revised with respect to the order between theme and source, goal, location (cf. (51)).

A well-formulated solution for the locative alternation is not supplied, but it is suggested (Jackendoff (1990, 171ff.)) that “the association of Patient with direct object is not invariable”. This means that that the *wagon* in *The cardinal loaded bottles on the wagon* may also be affected to a certain degree, since the paraphrase *What the cardinal did to the wagon was load bottles onto it* is judged “not too bad” by Jackendoff (1990, 172). A patient is also not necessarily present in the NP *with* NP version, but the direct object has only a stronger claim to be patient. As a consequence completeness in terms of a patient in the action tier is only optionally present in CS. There is the possibility, then, for more than two interpretations of the *load* sentences, but unfortunately, this is not worked out. The lexical entry for *load* NP *with* NP includes a non-indexed theme (*bottles*) so that it is not an argument of the verb, but rather a possible *with*-adjunct (Jackendoff (1990, 173)). The theme and goal for *load* NP *on* NP are both coindexed with the syntax. This resembles the LFG-treatment of the locative alternation (cf. ch. 4.1.6).

The (simplified) CS of *sent* in *Peter sent the pope a parrot* is given below.

$$(56) \left[\begin{array}{l} \text{CAUSE}^+ ([\text{PETER}]_i, [\text{GO} ([\text{PARROT}]_j, [\text{FROM} [\text{PETER}] \text{ TO } [\text{POPE}]_k)]) \\ \text{AFF}^+ ([\text{PETER}]_i, [\text{POPE}]_k) \end{array} \right]^{77}$$

It follows that *Peter* is source and agent, *a parrot* is theme and *the pope* is beneficiary and goal. In contrast to (56) the sentence *Peter sent a parrot to the pope* has no beneficiary (no Y in the action tier, at all) but only a goal in the thematic tier (*the pope*). The two versions thus differ in the conceptualization of the beneficiary. This is unified in a single lexical entry, wherein the beneficiary is conceptually optional. This nicely captures the semantic difference between the versions. Additionally, the CAUSE in the prepositional object version is presumably not a CAUSE⁺, i.e. the success of the event send is not implied. The question remains why deny, for example, allows the double object but not the prepositional object construction. Anyway, Jackendoff's treatment of the argument alternations is the most satisfactory, up to this point. This is due to the very rich CS, but this raises a theoretical

question: Which kind of knowledge should be involved in an approach to syntax (cf. chapter 2.2). It seems that a complete lexical entry for a predicate is identical to a person's concept (i.e. world knowledge) of that item. But this shall not be discussed here.

The action tiers for psychological verbs are given below (Jackendoff (1990, 141)), the German examples inferred:

- (57) a. *x pleases y* [STATE AFF⁺ ([X], [Y])]
 b. *x frightened y* [EVENT AFF⁻_{vol+/-} ([X], [Y])]
 c. *y likes x* [STATE REACT⁺ ([Y], [X])]
 d. *y fears x* [STATE REACT⁻ ([Y], [X])]
 e. *x gefällt y* [STATE REACT⁺ ([Y], [X])]
 f. *x vertraut y* [STATE AFF⁺ ([X], [Y])]
 g. *x interessiert y* [STATE REACT ([Y], [X])]

The conceptual category REACT describes the reaction of the experiencer to the stimulus and is thought to map the patient into subject position (Jackendoff (1990, 140f.)). This should be the reason why action tiers containing REACT disallow passivization. This works for *please* and *frighten*, *vertrauen*, *gefallen* and *interessieren* but not for *like* and *fear*. It is unclear, why there should be some exceptional function which maps a patient to subject position, which violates principles like the (R)UTAH* severely, although a hierarchical linking is assumed. And another problem becomes obvious here. Jackendoff's theory is applicable to English alone. It is impossible to account for the German case-patterns in e. & f. above where the "reactor" does not appear in subject position, while the stimulus is not an agent at the same time.

"All of these analyses ascribe the problems to an exceptional property somewhere in the mapping from thematic roles to S-structure. So far we have not located a cognate exceptional category here, from which the peculiarities of these verbs could be deduced. So something has been missed." (Jackendoff (1990, 266)).

4.2.2 Construction Grammar

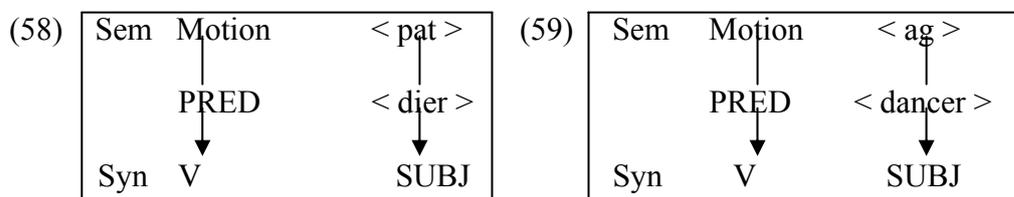
Construction Grammar* (ConG) has grown out of work of Fillmore (1977). In this paper he revised some ideas of Case Grammar. The idea was that "meanings are relativized to scenes" (Fillmore (1977, 59)). That is how a concept of an event is expressed in syntax depends on

what perspective one takes. The transfer of z from x to y that is accompanied by the change of w from y to x can either be described as selling or buying, depending on the perspective. The perspective taken is interdependent with cases in the case frame. This idea contradicts those of Jackendoff (1972 and subsequent) whose thematic analysis includes every aspect of this event, i.e. all possible perspectives on it. The “scenes” (Fillmore (1977, 72ff.)) are thought to be cognitively represented and they are activated dependent on the perspective taken with respect to an event. “The point is that, whenever we pick up a word or phrase, we automatically drag along with it the larger context or framework in terms of which the word or phrase we have chosen has an interpretation.” (Fillmore (1977, 74)). A salience hierarchy containing notions like animacy and sentience determines what is in the foreground, and a case hierarchy (mainly that indicated in the subject selection hierarchy of 1968) determines which grammatical functions are assigned to foregrounded entities.

These basic ideas have been further developed by Goldberg (1995), to name just one. Very roughly, constructions here correspond to scene-meaning relations. Accordingly, a construction C is defined as a “construction, iff_{def} C is a form-meaning pair $\langle F_i, S_i \rangle$ such that some aspect of F_i or some aspect of S_i is not strictly predicable from C ’s component parts or from other previously established constructions.” (Goldberg (1995, 4)). This means that there are meanings established by constructions which would not be detectable, describable and explainable in terms of smaller units. They are thus primitives*. Verbs do not have argument structures but intransitive, transitive and ditransitive relations are directly associated with constructions. Verbs are “associated with one or a few basic senses which must be integrated into the meaning of the construction.” (Goldberg (1995, 11)). The linking from semantics to syntax is done by the use of constructions, not via lexical entries. Before turning to language data it must be mentioned that ConG makes use of two kinds of thematic roles but it is no tier-proposal. Constructions contain “argument roles” which correspond to “Fillmore’s early case roles or Gruber’s thematic roles” (Goldberg (1995, 43)), although they are based on completely different theoretic foundations. Opposed to them are “participant roles” which are associated with the frames of verbs. Actually, they are individual thematic roles. E.g. *steal* and *rob* share the same constructions but differ in their “profiled” participant roles: \langle **robber**, **victim**, goods \rangle vs. \langle **stealer**, source, **goods** \rangle ; someone robs victims, but steals goods. Now “every argument linked to a direct grammatical relation (SUBJ, OBJ, or OBJ₂) is constructionally profiled.” (Goldberg (1995, 48)). Verbal participant roles and constructional argument roles must be fused.⁷⁸ Which argument role is fused with which participant role and – the more important question – which participant role is linked to which grammatical

function* “must be stated at the level of the construction.” (Goldberg (1995, 101)). This resembles theories which defend a strong lexicalist hypothesis. In ConG it is not the lexicon but the inventory of constructions, the “construction”, which contains the linking information.

In other words, *die* and *dance* would have a constructional representation as follows:



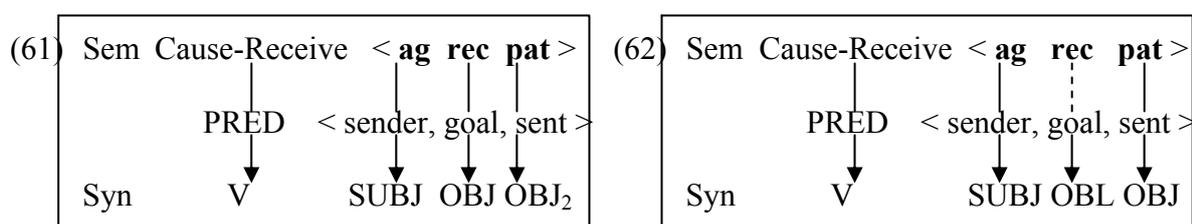
Thus, constructions turn out to be the linking instances in that they contain the syntactic and the semantic information necessary. What this way of description fails to capture is the possibility of predicting the syntactic behaviour of several semantic predicates and their arguments. The idea that the relationship between participant and argument roles can be defined by stating that the one is an instance of another one, and that this is cognitively represented, seems plausible (i.e. the difference between individual roles and role types where the latter is an abstraction – as a cognitive operation – from the former). The connection between participant roles and grammatical functions seems, however, highly stipulated. Degree of membership in the one or the other class as well as auxiliary selection cannot be captured at all, since there is not lexicon in the narrow sense.

Goldberg (1995, 57) states that passive “applies only to verbs which are associated with two or more roles, one of which is higher than the others” with respect to the following hierarchy.

- (60) agent, cause > recipient, experiencer > instrument > patient, theme > location, source, goal

“The passive construction serves to shade the highest ranked participant role associated with the verb.” (Goldberg (1995, 57)). The subject in active voice is simply “deprofiled”. The above generalization excludes unergatives like *tanzen* in German, but on the next page Goldberg (1995, 57f.) contradicts herself: German stative impersonal constructions cut their arguments, i.e. they must not be expressed. E.g. *Hier wird nur von Frauen getanzt* contradicts this generalization. And *Hier wird nicht ins Becken gesprungen* contradicts the generalization that impersonal passive applies only to stative constructions. In addition, *The child is touching the book (accidentally)* consists presumably of a theme and a patient. The sentence can be passivized, against the prediction made in (60).

The construction for the double object construction is given in (61), that of the prepositional object version in (62) (cf. Goldberg (1995, ch. 2.4.2 and 6))



The dotted line indicates semantic restriction on the recipient in the prepositional object constructions, namely its animacy. The slight semantic difference is thus implicit in the constructions of the ADOC. The constructions are related by different rules. The thematic analysis lacks precision, since Goldberg (1995, 38) classifies sent as the central sense-construction for ditransitives, according to which the “sender” successfully transfers the “sent” to the “goal” in both constructions. In chapter 3.4 another analysis has been given. The prepositional object version does not imply a successful event. This is not thematically reflected.

The overall impression is that there is a great potential in ConG, but unfortunately Goldberg’s (1995) work is not so well worked out or in parts unfinished, since there are several imprecise and sometimes even contradictory formulations. In the outline of the ADOC above much has been inferred and the correct treatment cannot be guaranteed, since it is not so well explicated in Goldberg (1995). The locative alternation and psych-verbs are left out, here. Their seeming idiosyncrasies can also be expressed in terms of constructions because the concept of constructions – charged with much semantic and syntactic information – allows this, unfortunately at the cost of generalizations. ConG would profit from an additional linking theory, like LFG has profited from LMT.

4.2.3 Lexical-Functional Grammar/Lexical Mapping Theory

Here the original Lexical Mapping Theory*, i.e. the argument structure and extension of LFG* is presented (Bresnan/Kanerva (1989, 1992, henceforth BK; Bresnan/Zaenen (1990), henceforth BK).⁷⁹ In early LFG (Bresnan (1982a)) thematic roles were lexically specified and grammatical functions* were lexically assigned to role-bearing arguments of predicates. To constrain generalizations in linking and to enhance the mapping LMT has been developed.

The assumed hierarchy of thematic roles is given in (63) below together with the classifications of grammatical functions in terms of features in (64) (BK (1989, 23)):

- (63) ag > ben > recip/exp > inst > th/pat > loc (64) [- r/- o] - SUBJ [+ r/- o] - OBL_θ
 [- r/+ o] - OBJ [+ r/+ o] - OBJ_θ

[+/- r] means “thematically unrestricted or not” and [+/- o] means “objective or not”. Subjects and objects are considered to be able to be associated with any role. Obliques and indirect objects are considered to bear fixed roles. Subjects and obliques cannot be objects, objects and indirect objects are (trivially) always objects. Grammatical functions can also be ordered now, according to the features.

- (65) SUBJ > OBJ > OBL_θ/OBJ_θ,
 (where [-] outranks [+], [r] outranks [o])

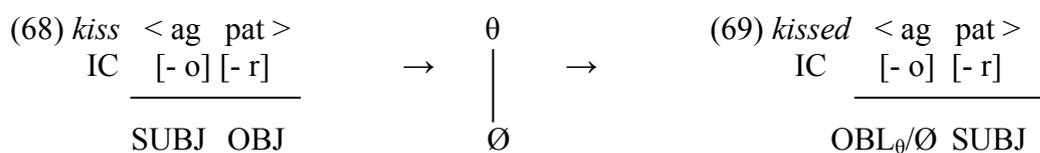
Now thematic roles can be associated partially with those features via lexical mapping principles. “Intrinsic classification” (BK (1989, 25)) means that agents are always encoded as [- o], themes/patients as [- r] and locatives as [- o]. Morphosyntactic operations, e.g. passive, suppress the highest thematic role [$\theta = \emptyset$] (BK (1989, 26f.)). Two wellformedness-conditions say that “[e]very lexical form must have a subject” and “[i]n every lexical form, every expressed role must have a unique syntactic function, and every syntactic function must have a unique lexical role” (BK (1989, 28)).⁸⁰ Mapping applies according to both hierarchies above, from left to right.

Within theories which assume underlying syntactic structures it is easy to account for split intransitivity: unaccusatives are analysed as having underlying objects, unergatives have underlying subjects. Such a solution is not possible for the monostratal LFG-LMT. It uses its mapping algorithm including the features of grammatical functions based on cross-linguistic generalizations.

- | | | |
|--|-------------------------|--|
| (66) <i>dance</i> < ag >
IC ⁸¹ [- o]
<hr style="width: 50%; margin: 0 auto;"/> SUBJ | ----- a-structure ----- | (67) <i>die</i> < pat/th >
IC [- r]
<hr style="width: 50%; margin: 0 auto;"/> SUBJ |
| ----- f-structure ----- | | |

This solution for split intransitivity is clearly more satisfactory than that of early LFG, but it still does not account for the German impersonal passive, which violates the first

wellformedness-condition, and for auxiliary selection, which again is probably lexically governed. The passive is given below, the morpholexical operation between them.



This early LMT does not account for thematic restrictions on the passive. It simply states that the thematically most prominent (and not a particular role because it should be “invisible” to the syntax) argument is suppressed (BZ (1990), BK (1989)). It thus allows passives that are in fact not possible (e.g. some theme-location constructions, cf. ch. 3.2). BK (1992) at the same time reject Jackendoff’s (1972) ordering of theme above location. As a result, Jackendoff overgeneralizes the restriction of passivization while BK (1989, 1992) overgeneralize the application of passivization.⁸² A solution – but again a rather stipulated one – is to classify intrinsically non-passivizable arguments as [+ o].

Argument alternations should be difficult to capture since they differ in grammatical functions but often do not differ in thematic structure. The assignment of functions on the other hand is governed by the features of the thematic structure in LMT and therefore must be predicted to result in identical grammatical function assignments; yet, this is impossible since the alternation in fact exists. As a consequence, identical thematic structures must be analysed differently in terms of features. Actually, in the ADOC* recipients (there are no goals available in LMT according to (63)) and patients should be analysed as [- r]. But this would allow an presumably ill-formed passive **The parrot is given the pope by the cardinal*. Therefore the patient must be classified [+ o], the recipient [- r]. In English, another analysis is not possible according to the IC parameter (BK (1992, 115)). Hence, there is only one possibility to account for the prepositional object construction. Both recipient and theme can occur as passive subjects and must therefore be [- o]. But according to the ICP they cannot both be [- r]. So the recipient must be [+ r]. What is the reason for this? The only reason seems to be that the recipient must become an OBL_θ in order to result in a prepositional object construction, but this is obviously redundant. Thus, the further developed LFG remains problematic, since many classifications seem to be stipulated. It remains what causal relationship between both and the semantic differences exists.

(70) double object:
send < ag rec pat >
 IC [- o] [- r] [+ o]

SUBJ OBJ_θ OBJ

(71) prepositional object:
send < ag rec pat >
 [- o] [+ r] [- r]

SUBJ OBL_θ OBJ

LMT does not make reference to case, therefore a treatment of psych-verbs will not be attempted. The locative alternation can be thematically analysed very much like in early LFG with agent, theme, location in the first, agent and theme in the second construction. Their classification is completely captured by the above mentioned Intrinsic Classification (BK (1989, 25)). In sum, it remains unclear which role the feature [-/+ o] on objects plays with respect to a) passivization and b) the ADOC. If it does play a role in passivization ([+ o] prevents from passivization) the application of passivization can be restricted but the behaviour of the ADOC with respect to the passive remains unexplained. If it does not play a role, the ADOC can be explained, but passivization is completely unrestricted. Additionally, languages with an (at least relatively) rich case system (e.g. German) can not be accounted for, at all. Another linking algorithm, perhaps between grammatical functions and case, would be necessary.

4.2.4 Principles & Parameters/Minimalism

For reasons of space I will discuss Grimshaw in the context of unaccusatives, passivization and the locative alternation, Larson (1988) and Hale/Keyser (2002) in the context of the ADOC, and Belletti/Rizzi (1988) in the context of psychological verbs. This will give an appropriate impression of thematic role theories within P&P and Minimalism.

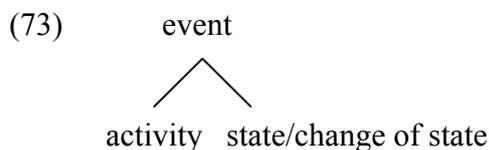
The notion of “external argument” has been extensively used in syntactic theories since the 1980s. Grimshaw’s (1990) definition differs from that of Williams’ (1981a) in that her external argument must be most prominent in two hierarchies within lexical-semantic structure, which are given below (Grimshaw (1990, 8, 24)).

(72) (Agent (Experiencer (Goal/Source/Location (Theme))))),

(73) (Cause (other (...))),

where parentheses reflect prominence and least embedded means most prominent, more deeply embedded means less prominent.

Thus, the notion external argument is a semantic notion, not a syntactic one. An argument is most prominent aspectually (i.e. according to the hierarchy in (73)), if it is associated with the first of two sub-events of an event described by a verb (Grimshaw (1990, 40)).

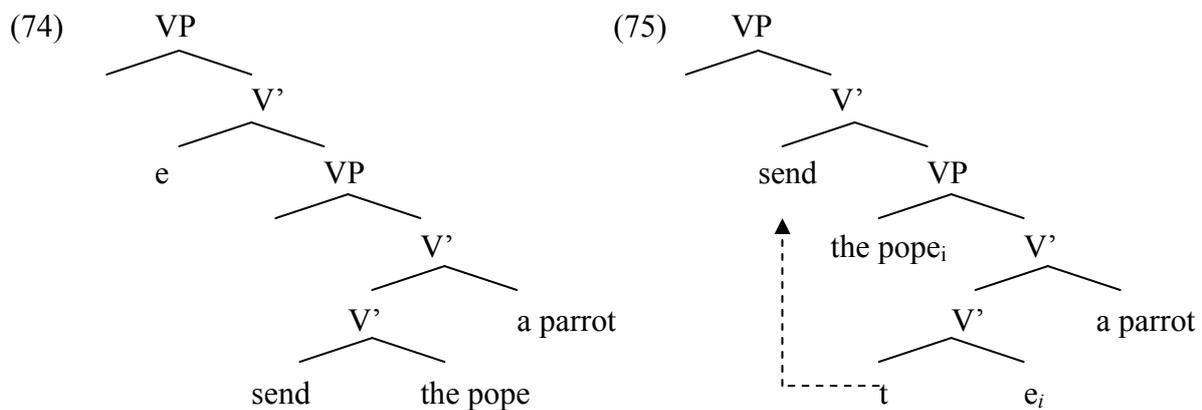


An unergative verb, according to this theory, has an argument that is an agent and also associated with the first sub-event in (73). Thus, it is a cause in the aspectual hierarchy. As a result, it is most prominent in both dimensions and has an external argument. That enables an unergative verb to undergo passivization (since passivization suppresses an external argument) (Grimshaw (1990, 36)). The argument of an unaccusative verb, on the other hand, will always be associated with the second sub-event of a matrix-event. It is thus not aspectually most prominent (relative to the event-structure). It is thematically a theme and not most prominent, as well. As a consequence, it lacks an external argument and fails to undergo passivization. While *dance/tanzen*, for example, has a d-structure subject (resulting from the aspectual prominence of its argument) and an external argument (resulting from the prominence of its argument in both hierarchies) *die/sterben* lacks both (because of the lower status of its arguments in both hierarchies). Thus, Grimshaw's theory of a-structure nicely draws the behaviour of predicates with respect to split intransitivity and passivization from their semantics.⁸³ She was the first to give such a well-designed theory which does not charge the lexicon to a similarly high degree as previous theories did. All the same, auxiliary selection as an indicator of the gradience of membership in the one class or the other remains a lexical task, although the assumption of two hierarchies is presumably the appropriate means to capture such matters of degree. Still a problem of hierarchies seems to be how fine-grained they must be, and two sub-events and four roles⁸⁴ are not fine-grained enough. Language-specific differences (*tanzen* vs. *dance*) in passivization remain unexplained, too.

The *load NP with NP* version of the locative alternation in which only the first NP is a true argument matches the event structure. The agent NP will also be cause, the object NP will be theme (since there is no patient) and unspecified in the aspectual hierarchy. Matters of affection and aspect remain unexplained. The *load NP on NP* version is more complicated, since Grimshaw's theory makes no prediction as to the order of the post-verbal NPs. In addition, the adjacent NP is again a theme, although its semantics differ considerably from

those of the adjacent NP in the other *load*-version. There are obviously three obligatory arguments of this *load*, but only two sub-events that can be associated with them. Subsequently, this is a problem for all ditransitive verbs. Although the idea of an aspectual structure based on abstract event-structures seems promising, it is not explicated and designed satisfactorily, given the fact that this is possible, at all.

The theory of Larson (1988) for the double object construction is characterized by the attempt to maintain a) the fact that the goal c-commands the theme and b) to give a unified account for the ADOC with respect to the UTAH*. The first of these will not be discussed here. To account for the second Larson (1988) and Hale/Keyser (2002) have assumed a passive-like d-structure for both versions of *send*. It is – in the form of Larson (1988) within P&P with a modified X-bar structure (“VP shells”) – given below (cf. Larson (1988, 353)).



The indirect object of (74), i.e. *the pope* first moves to [Spec, VP]. In this case the verb *send* raises to V-head position where it assigns case to the right. Why does the goal move? Because the above d-structure is in fact a passive structure and the passive absorbs the case of the goal; also in the case there is a preposition *to*, it is absorbed. The theme, i.e. the subject of VP and the direct object of *send* is demoted to the status of an adjunct. Larson (1988, 352) has had to modify θ -theory in order to assign θ -role to an adjunct.

(76) Argument demotion:

If α is a θ -role assigned by X^i , then α may be assigned (up to optionality) to an adjunct of X^i .

The goal is now without case in its d-structure position, and the position of *the parrot* is non-thematic but is subject to (76). So movement applies to *the pope* which must move into [Spec, VP] and to the verb. With this treatment of the ADOC Larson (1988), and similar

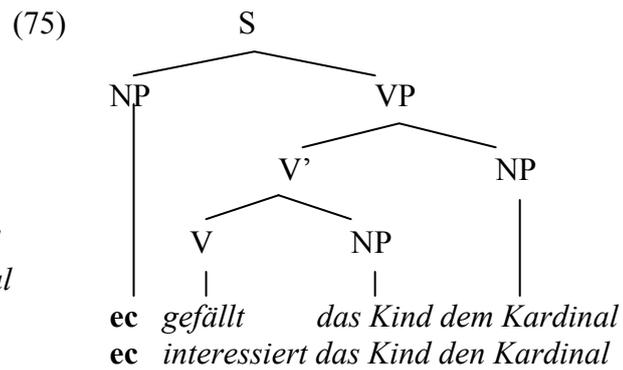
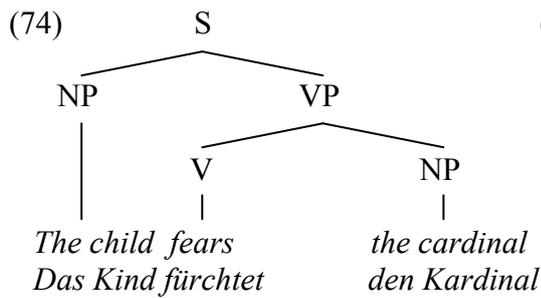
Hale/Keyser (2002), are able to maintain a relativized UTAH*. The hierarchy Larson (1988, 382) assumes is given below. It is that of Carrier-Duncan (1985). The according linking principle is also given below:

(77) agent > theme > goal > obliques (manner, location, time, ...)

(78) If a verb α determines θ -roles $\theta_1, \theta_2, \dots, \theta_n$, then the lowest role on the thematic hierarchy is assigned to the lowest argument in constituent structure, the next lowest role to the next lowest argument, and so on.

Probably, this treatment of the ADOC is the best-known one within P&P framework. Its advantages are clearly the maintaining of the RUTAH and the c-commando relations among the arguments. The problem remains unsolved whether this squeezing of the ADOC into the architecture of P&P is convincing and plausible, because apart from the structural requirements the passive does not at all resemble the ADOC according to their characterizations in ch. 3. As was noted before, the goals of most P&P work was to give structural explanations for phenomena which have later turned out to be rather semantic in kind. The discussion in chapter 3.4 indicates that there are indeed semantic differences which Larson and Hale/Keyser cannot account for. Their quasi-passive treatment would be a more promising one, if one analysed *send* structurally as [CAUSE to GO to], where [GO] was the head of the lower VP and CAUSE the head of the upper VP. This, however, would not capture semantic differences. To conclude, it must be noted that Larson's (1988) and Grimshaw's (1990) thematic hierarchies differ with respect to the ranking of theme and goal (just like Jackendoff (1972) Bresnan/Kanerva (1989, 1992)), the presence of an experiencer and the role of source and location. Why are they "true" roles in Grimshaw's theory, but "oblique" roles in Larson's and Carrier-Duncan's proposals?

Belletti/Rizzi (1988, 293, henceforth BR) propose the following structures for the psychological verbs *fürchten/fear* (74) and for *interessieren/gefallen* (75).⁸⁵



According to the theory of external arguments in BR (1988, 343), an external argument is underscored in the θ -grid of a verb (cf. also Williams (1981a), ch. 4.1.1). The structures above indicate that *fürchten/fear* (exp, th) have an external argument, while *gefallen/interessieren* (exp, th) lack one. θ -marking applies as follows: The verb θ -marks its theme, and V + theme then marks the experiencer. The mapping rule is a relativized UTAH* and is given below (BR (1988, 332)).

(76) Mapping rule:

Given a θ -grid (exp, th), the experiencer is mapped to a higher position than the theme.

This is also indicated by the above tree-structures: In (74) the experiencer is a daughter of S while the theme is a daughter of VP. In (75) the experiencer is a daughter of VP and the theme is daughter of V'. Thus, at d-structure level, the prominence relations are the same for both verb-classes but they differ at the surface where *fear/fürchten* is realized as [exp > th], and *interessieren/gefallen* as [th > exp]. Case assignment applies via a rule BK ((1988, 332)):

(77) V is a structural case assigner iff it has an external argument.

Only *fürchten/fear* has an external argument, so its lexical entry is finally the one given in (78). The other verb-class lacks an external argument. Their theme argument moves into [NP, S] to receive nominative case. The experiencer is lexically case-marked. The entries for *interessieren/gefallen* are given in (79) (where *str* means structural case)

(78) *fear/fürchten* (exp, th)
 (str, str)

(79) *interessieren* (exp, th)
 (acc, str)
gefallen (exp, th)
 (dat, str)

BR's theory makes important generalizations possible, namely the prominence relations among arguments between lexical semantics and syntactic (d-)structure are preserved. Unfortunately, this is done at cost of the charge of the lexicon and cross-linguistic generalizations. First, the external argument is lexically determined. There is an advantage for Grimshaw's theory, who determines it on a semantic basis. Second, why can't the experiencer of *interessieren/gefallen* move into subject position? According to BR this is due to the fact that the experiencer receives lexical case. But this is done by (lexical) stipulation, so the solution is not convincing. Third, the case-variation with this class of psych-verbs was observed for Italian by BR. If it is indeed a lexical and idiosyncratic phenomenon, why can it be found in such a great number of languages? E.g. it has been shown here for German, a non-Romantic language, in which the verbs behave similarly. It seems improbable that this case-variation is really an idiosyncratic property of these psych-verbs. There must be another explanation possible. (For other proposals within P&P cf. Nishigauchi (1984), Carrier-Duncan (1985), Jones (1988), Pesetzky (1995), among many others).

4.2.5 Optimality Theory

Optimality Theory* can be called the "ultimate ranking theory" (besides Functional Grammar*) since ranking different constraints (which in turn may consist of hierarchies of different notions) is the crucial property of OT. The constraints themselves may contain hierarchies of thematic roles. This is the reason why OT is mentioned here. Though it will not be discussed here, since the two relevant OT-approaches to thematic roles make use of a ranking of generalized* thematic roles (cf. Aissen (1999), Primus (1999, 2002, 2006)). Because of reasons of space only Primus will be discussed in this work (cf. ch. 4.3.3). Nevertheless, it can be anticipated here that the ultimate way out of problems can be done in OT via ranking a constraint highest which includes lexical idiosyncratic assignment of case or thematic role or structural position, i.e. "lexical constraints" (e.g. Primus (2002, 18))⁸⁶ and therefore they propose similar solutions, like many other theories discussed here.

Summed up, one can observe that since Fillmore (1968) thematic hierarchy* solutions for the problems stated by the phenomena discussed here have been a promising way to capture the generalizations that can be made with respect to the mapping of semantic arguments into syntax. The ranking of roles together with principles of prominence preservation ((R)UTAH)

satisfactorily account for the mapping of simple intransitive verbs and restrictions on passivization. Argument alternations are quite more complicated (not only rankings matter but also semantic differences and aspectual factors) and psychological verbs are far from being explained satisfactorily. Furthermore, there is obviously no agreement about the exact ranking of roles that would explain all the phenomena (e.g. Jackendoff (1972) vs. (Bresnan/Kanerva (1989, 1992); Grimshaw (1990) vs. Larson (1988) & Carrier-Duncan (1985)). In addition, the problem of discrete* role theories, i.e. which roles are indeed contained in the list, remains unsolved (e.g. experiencer vs. no experiencer, i.e. Grimshaw (1990) vs. Larson (1988); “true” source/goal/location vs. “oblique source/location vs. solely “true” location, i.e. Jackendoff (1972) vs. Carrier/Duncan (1985) vs. Bresnan (2001)). This makes it doubtful, whether a hierarchy of thematic roles is really part of universal grammar (cf. Dowty (1991), Levin/Rappaport Hovav (2005)). A development to be observed is that the theories have increasingly referred to lexical semantics/conceptual structure to explain linking regularities instead of charging the mental lexicon with idiosyncratic information. Especially Jackendoff’s (1972 and subsequent) work during the decades must be emphasized here and Grimshaw’s “break-out” from what Jackendoff (e.g. 2002) has called “syntactocentrism”. The proposal of different tiers besides a thematic one, e.g. an action tier (like those of Culicover/Wilkins (1986) and Jackendoff (1987, 1990)) or an aspectual tier (like that of Grimshaw (1990)). This is also a promising idea as much as it may explain co-occurrence restrictions on thematic (or other) roles on the one hand, and in that it may serve to split their “competences” (e.g. Grimshaw’s (1990) thematic hierarchy governs matters like preposition choice and the aspectual hierarchies governs subject-object choice). Though, the theoretical insufficiency, subject to the above criticism, has resulted in a partial rejection of discrete roles as well as role hierarchies.

4.3 Generalized thematic role solutions

Most thematic role theories discussed so far rely on the assumption

“that categories [like those represented by thematic roles – S. K.] are logical bounded entities, membership in which is defined by an item’s possession of a simple set of criterial features, in which all instances possessing the criterial attributes have a full and equal degree of membership.” (Rosch/Mervis (1975, 573f.)).

This conception of roles has led to problems that could not be solved so far. Among the theories discussed in chapters 4.1 & 4.2 there is none that has given a completely satisfactory account for the facts, neither that e.g. the membership of verbs in the two classes of split intransitivity is a matter of degree, nor for the fact that some direct objects seem to be more affected than others nor for the assumption that indirect objects are possibly less affected than direct objects. The invention of more and more roles to capture these fine-grained semantic differences has led to a great disagreement with respect to thematic roles, their theoretical status and content. One way out of this dilemma could be the adoption and exploitation of ideas of “semantic prototypes”. “The origin of prototypes of categories is an issue because [...] there is now considerable evidence that the extent to which members are conceived typical of a category appears to be an important variable in the cognitive processing of categories.” (Rosch/Mervis (1975, 599)). The idea is that the particular thematic roles share some “family resemblances” which could be used as subject to generalization in order to formulate two (or more) prototypical thematic roles (cf. Kailuweit (2003)). “The concept of family resemblances is also of general use because it characterizes prototype formation as part of the general process by which categories themselves are formed.” (Rosch/Mervis (1975, 602)). This is a promising concept for research in the syntax-semantics interface, since many theories have been developed that distinguished themselves from “Chomskyan paradigms” in assuming only one syntactic structure. These theories cannot assume underlying grammatical relations or initial structural position but now they can assume prototypical thematic roles as an interface between lexical-conceptual and syntactic structures (cf. van Valin (1999)). On the other hand they have to prove their cognitive significance, since Chomsky has defined linguistics as a part of cognitive psychology already fifty years ago. The prototype theory supplies this.

4.3.1 Role and Reference Grammar and related theories

4.3.1.1 Role and Reference Grammar

The first theory grammar that has made use of generalized thematic roles is Role and Reference Grammar*. Only the latest version of the theory will be discussed here.⁸⁷ The generalized thematic roles, i.e. the “macroroles” “actor” and “undergoer” in RRG, serve as an interface between positions in lexically decomposed structures of verbs and the PSA⁸⁸/cases, respectively (van Valin (2005, ch. 2)). Thus, they are discrete categories. Predicates are decomposed according to *aktionsarten* (built on work of Dowty (1979)). Sequences in

decomposed structures correspond to positions in the Actor-Undergoer Hierarchy (AUH). The hierarchy and the positions in it are abstractions from discrete thematic roles as indicated by the angled brackets in the figure below (cf. van Valin (2005, 53ff.)).

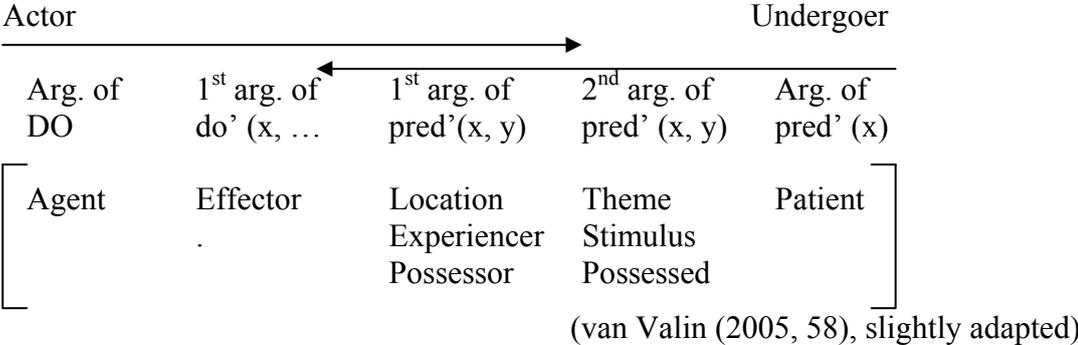


Figure 4.1: Actor-Undergoer Hierarchy

Thus, in terms of Rosch/Mervis (1975) actors build a category (relative to undergoers) with more ([Arg. of DO]) or less (e.g. [1st arg. of pred' (x, y)]) prototypical members but – most important – which behave similarly grammatically. The leftmost argument in a logical structure will become actor, the rightmost becomes undergoer, if not specified differently in the lexicon.⁸⁹ An unaccusative verb like *sterben/die* has the logical structure [BECOME **dead'** (x)] (cf. van Valin (2005, 42ff.)). According to the Default Macrorole Assignment Principle (cf. note 39) the argument of *sterben/die* is thus the argument of [pred' (x)] and will become Undergoer, since it lacks an activity predicate ([do' (x, ...)]). An unergative verb like *tanzen/dance* has the logical structure [do' (x) [run' (x)]]; the argument has an activity predicate with it, the first argument of [do' (x, ...)]; it is thus assigned the actor macrorole. The auxiliary selection for Italian says that a logical structure containing no activity predicate assigns *essere* (van Valin (1990, 233)), i.e. all unaccusatives take probably *sein/be* as auxiliary (operator projection of the nucleus) and all unergatives take *haben/have*. That is a wrong generalization (cf. ch. 3.1); exceptions are presumably contained in the lexicon. It seems, then, that the degree of membership in the intransitive classes cannot be captured but by the lexicon, although the AUH is actually designed for such matters. The unaccusative logical structure is contained in the unergative logical structure [do' (x) [pred' (x)]]; this resembles the underlying/initial subject/1 and underlying/initial object/2 analysis of split intransitivity. In order to capture the different degrees of membership one possibly could make the sequences [1st&2nd arg. of pred' (x, y)] accessible for arguments of intransitive verbs. Then the accusative argument of *kill* and the nominative argument of *die* would take the same position and split intransitivity would be more open to differences in degree of

membership. Surface Unaccusativity remains unexplained, too. One had to analyse it as a transitive construction to which demotion of the actor applies but no promotion of the undergoer. The appropriate adjustment of the linking rules would result in a loss of generalization.

The application of passivization⁹⁰ could not be restricted in terms of a particular thematic role in all the theories discussed so far, i.e. a rule stating e.g. “For passivization there must be an agent in active voice” is not possible, since passivization is possible with the involvement of many other roles. With generalized thematic roles and macroroles in special passivization can be treated more elegantly. Its application is simply restricted by the presence of an actor, i.e. the sequence (at least) [do’ (x, ...)] in the logical structure; this is actually possible for actors that are inanimate (cf. van Valin/Diedrichsen (2006, 8)). The PSA is assigned to the undergoer, i.e. a marked PSA choice (van Valin (2005, 100)). The rest is done by “constructional schemas” (van Valin (2005, 131f.)) in which only the language-specific information of a construction is captured.⁹¹ The passive in English is associated with the special features according to which a non-macrorole direct core argument may be the PSA in passive, e.g. the recipient/goal in the double-object construction. In German only macrorole arguments can be PSAs, e.g. the recipient/goal in the ditransitive construction remains in dative case and does not trigger agreement with the verb (cf. van Valin (2006, 6)). The construction also contains morphological and semantic information. The question whether impersonal passive is possible in a language or not is governed by the “general characterization of basic voice constructions” (cf. note 40) which consists of two parts. Only if the second part applies, impersonal passive is possible. Unfortunately, this is not explained adequately. One could argue, that English does not have the appropriate template in its inventory but only templates for passives with at least two core-NPs (cf. van Valin (2005, 13ff.)). Otherwise this must also be contained in the constructional schema for the English passive.

With respect to the ADOC* there is only one logical structure for both syntactic constructions. The logical structure is subject to a default and to a marked undergoer selection (van Valin (2007, 43ff.)).

(80) [do’ (x, Ø)] CAUSE [BECOME **have**’ (y, z)]

(80’) The cardinal sent the pope a parrot.

(80’’) The cardinal sent a parrot to the pope.

alternations. The same can be observed in German, where *schenken* and *laden* have the causative counterparts *beschenken* and *beladen*. The former belongs to the *give/send*-class, the latter to the *load*-class. The many semantic differences with the locative alternation result from the lexical features of the post-nuclear NPs, then. The observation of Jackendoff (1996) according to which the “holistic” reading is only a tendency and not a necessity is also included in the RRG treatment. It remains open, whether *load/laden* has really only one lexical entry, in other words, is there really only one verb *load* (cf. ch. 3.3)? This also fails to capture the optionality of the *with*-phrase.

The design of RRG clearly implies that psychological verbs do not get a special treatment since experiencers, stimuli and targets (Pesetzky (1995)) are included in the AUH and the notions of actor and undergoer. The presumed lexical entries are given below (cf. figure 3.5).

(83) *please*: **do'** (x, [**please'** (x, y)] or [**do'** (x, Ø)] CAUSE [BECOME **pleased'** (y)]

(84) *frighten*: [**frighten'** (x, y)] or [**do'** (x, Ø)] CAUSE [BECOME **frightened'** (y)]

(85) *like/fear*: **do'** (x, [**like'/fear'** (x, y)])

(86) *gefallen*: [**gefallen'** (x, y)] [MR1]⁹³

(87) *interessieren/wundern*: [**interessieren'/wundern'** (x, y)] ???

(88) *vertrauen*: **do'** (x, [**vertrauen'** (x, y)]) [MR1]

There is obviously a problem with *interessieren*. According to the Default Macrorole Assignment Principle (cf. note 39) *interessieren* can maximally take one macrorole, since it lacks an activity predicate. Now *x* and *y* are possible candidates for the macrorole that must be undergoer. This must be specified, possibly as U = *x*. The non-macrorole argument should receive dative case (van Valin (2005, 110)) but obviously bears accusative case. The fact cannot be captured, since case-marking is not a lexical matter in RRG.

Summed up, then, RRG supplies an analysis of the discussed phenomena that has great explanatory value. The logical decomposition together with the macroroles capture a great range of data and the concept of generalized thematic roles proves its superiority over discrete* role theories and thematic hierarchies*, as well. Information that is analysed as idiosyncratic is handled by notions like constructional schemas (passive) or lexical specifications (M-transitivity). Some practical problems remain: passivization of the ADOC in English, surface unaccusativity, German *interessieren*. And maybe some seemingly idiosyncratic information (restrictions on the ADOC (*deny*, *present*)) turns out to be systematic. Another, perhaps more severe problem concerns the logical decomposition (apart

from the classical criticism that decomposed structures may not capture all the semantic aspects or that they are not synonymous with the lexical items (cf. Dowty (1991, 598ff., Fodor (1970) etc.)). Van Valin (1996, 307) himself has recognized this problem, but presumably could not clear it up satisfactorily. He has stated that the logical structures obviously attribute “the property of ‘agency’ entirely to the verb, when it in fact is related in part to properties of the NP argument.” The problem should be resolved by the paper on effectors, but it is not limited to agency, but concerns NPs, or objects, in general, namely features like definiteness which crucially determine the semantics of a core, e.g. with respect to the locative alternation (cf. table 3.4). It seems that there is no mono-causal relationship between predicates and arguments (cf. ch. 5).

4.3.1.2 Kibrik (1997)

Kibrik (1997) makes use of macroroles only in a broad sense in order to propose a typology of argument distribution. Therefore it will only be briefly touched upon in order to illustrate the utilizing of RRG-notions in other directions. Actor and undergoer are subject to a further generalization the result of which are “hyperroles”. Hyperroles are a notion serving to generalize over the ways in which languages are coding their arguments of one- or two-place verbs. Building on Hopper/Thompson’s (1980) concept of prototypical transitivity and Givón’s “salient cause” and “effect”, Kibrik (1997, 288) bases his hyperroles on prototypical cause⁹⁴ and effect⁹⁵ in terms of which all languages are considered to categorize the participants of an event. Depending on the type of language these two concepts are extended to verb-classes the participants of which are less prototypical causes or effects. The use of agent and patient as hyperroles is only one strategy to extend the use of coding categories to non-prototypical verb-classes. The cross-linguistically different strategies are “accusative, ergative, active, and tripartite”, which seldom exist as a pure representative of one such class. The most prominent class are accusative languages, which make use of the hyperroles “principal” (“the main participant, the ‘hero’ of the situation, who is primarily responsible for the fact that this situation takes place”) and “patientive” (“the immediate, nearest, most involved or affected participant of the situation”) (Kibrik (1997, 292)). Principal and patientive are extensions of an actor and a transitive patient. This is given in figure 4.2 below. (The corresponding ergative strategy is a mirror-image of the above figure involving “agentive” and “absolutive”⁹⁶ hyperroles. In addition, “tripartite” languages make use of a

“sole”⁹⁷ hyperrole.) The hyperroles are in sum: principal, agentive, patientive, absolutive, actor, undergoer, sole.

two-place verbs	Arguments of one-place verbs		two-place verbs
Actor		→	transitive patient
P R I N C I P A L		→	PATIENTIVE
O	T H E R		S

Figure 4.2: *Principal and patientive hyperroles as extension-strategies in accusative languages*

(cf. Kibrik (1997, 292))

4.3.2 Dowty & successors

4.3.2.1 Dowty (1989, 1991)

The other famous theory making use of generalized thematic roles is that of Dowty (1991, building on ideas from 1989). His theory differs from van Valin’s in that his “proto-agent” and proto-patient” are not discrete categories, but rather sets of entailments of which arguments may be members to a certain degree by virtue of what a particular verb “entails” with respect to its arguments.⁹⁸ The proto-role properties are thus abstractions from the properties the arguments of a particular verb entail by virtue of being the arguments of this verb. Argument selection is governed by the “Argument Selection Principle” (ASP).⁹⁹ From the list of entailments and the principles for argument selection one can already anticipate that Dowty’s proto-role theory is the only one up to this point, which is able to capture different degrees of membership in intransitive verb-classes because of the “fuzziness” of the proto-roles. In what follows the proto-role entailments will be applied to the different language phenomena in order to examine the validity of the entailments and the argument selection principles. The results are given in the tables 4.4-4.7 below.

	<i>The parrot died</i>	<i>The cardinal danced</i>
proto-agent properties		
volitional involvement	-	+
sentience/perception	+/-	+
causing change of state	-	-
movement	-	+

independent existence	+	+
proto-patient properties		
undergoes change of state	+	-
incremental theme	+	-
causally affected by another	+/-	-
stationary	+	-
dependent existence	+	-
proto-role	P-P	P-A
predicted position linked to	none	none

Table 4.4: *Proto-role entailments and argument selection for split intransitivity*

Some entailments cannot definitively be attributed to some arguments. It is uncertain, whether the dying parrot is sentient. But it becomes clear that *die* has a proto-patient (P-P) as argument and *dance* a proto-agent (P-A). There is no argument selection principle designed for intransitives. It is obvious that both become subjects. It is also obvious that the arguments of *die* and *dance* have probably the same entailments as those of *sterben* and *tanzen*, but Dowty's theory makes no predictions as to their different grammatical behaviour. Nevertheless, the set of entailments allows intransitive verbs to have an intermediate status between unergatives and unaccusatives in the case it accumulates an approximately equal number of P-A and P-P properties (cf. also Dowty (1991, 605ff.)). The distribution for the ADOC is given below.

	<i>send the parrot</i>	<i>to the pope</i>	<i>send the pope</i>	<i>the parrot</i>
proto-agent properties				
volitional involvement	-	-	?	-
sentience/perception	-	-	?	-
causing change of state	-	-	-	-
movement	+	-	?	+
independent existence	+	+	+	+
proto-patient properties				
undergoes change of state	+	+	+	+
incremental theme	-	-	-	-
causally affected by another	+	+	+	+
stationary	-	+	?	-
dependent existence	-	-	-	-
proto-role	none	P-P	?	?
predicted position linked to	OBL/prepOBJ	OBJ	?	?

Table 4.5: *Proto-role entailments and argument selection for the ADOC**

The table above shows a result that does not make a clear statement on the appropriate linking, since it is difficult to interpret. The many question-marks with the recipient as direct object indicate this. The result depends on the intuition of the speakers. Approximately, *the pope* is the better P-P, when goal, but *the parrot* is the better P-P, when *the pope* is recipient,

since he accumulates (probably) several P-A entailments. This analysis contradicts the factual ordering. Therefore, the proto-role account of the ADOC is not well motivated.

	<i>load bottles</i>	<i>on the wagon</i>	<i>load the wagon</i>	<i>with bottles</i>
proto-agent properties				
volitional involvement	-	-	-	-
sentience/perception	-	-	-	-
causing change of state	?	-	-	?
movement	+	-	-	+
independent existence	+	+	+	+
proto-patient properties				
undergoes change of state	+	+	+	+
incremental theme	!+	-	!+	-
causally affected by another	+	+	+	+
stationary	-	+	+	-
dependent existence	-	-	-	-
proto-role	P-P	none	P-P	none
predicted position linked to	OBJ	OBL/prepOBJ	OBJ	OBL/prepOBJ

Table 4.6: *Proto-role entailments and argument selection for the locative alternation*

The locative alternation is the “favourite” phenomenon for this account, since the prediction for the argument selection relies fundamentally on the distribution of the entailment “incremental theme” which is attributed to the direct object in both sentences (the decisive status of this entailment is indicated by “!”). Thus, the argument selection is predicted correctly. At the same time, here lies the problem of the theory. According to the theory (Dowty (1991, 571ff.)) the distribution of the entailments depends on the verb alone. But the presentation of the phenomenon in ch. 3.3 (esp. table 3.4) has shown that also the definiteness of the arguments, which is independent of what a verb entails, determines the meaning to a certain degree. Thus, the proto-role account ignores the bi-directional dependencies between predicates and arguments. The (differently designed) table for psychological verbs is given below.

	<i>x pleases, frightens, likes, fears, gefällt, vertraut, interessiert y</i>
proto-agent properties	
volitional involvement	x: (pleaser), (frightener), ?liker, ?Vertrauender y: none
sentience/perception	x: (pleaser), (frightener), (liker), fearer, Vertrauender, (Gefallendes) y: pleased, frightened, (liked), dem x vertraut, dem x gefällt, den x interessiert
causing change of state	x: (pleaser), (frightener) y: none
movement	x: none y: none
independent existence	x: all y: all
proto-patient properties	

undergoes change of state	x: none y: !(pleased), !(frightened)
incremental theme	x: ?Vertrauender (“langsam x’s Vertrauen gewinnen”) y: ? Interessierter (“x interessiert y mehr und mehr“)
causally affected by another	x: fearer y: pleased, frightened, !den x interessiert, !dem x gefällt
stationary	x: all y: all
dependent existence	x: none y: none
proto-roles (with decreasing entailments from left to right)	P-A: pleaser, frightener, liker, fearer, Vertrauender, Gefallender, Interessierender; P-A = subject P-P: pleased, frightened, liked, feared, dem P-A vertraut, gefällt, den P-A interessiert; P-P = object

Table 4.7: *Proto-role entailments and argument selection for psychological verbs*

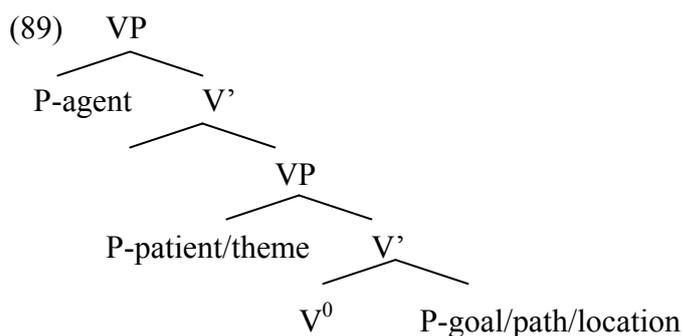
On the whole, the theory makes the right predictions about the argument selection of psych-verbs. *please* and *frighten* are clearly the most transitive verbs because they are telic and cause a change of state in one of their readings which is a) a decisive feature (“!”) and b) the difference to *fear* with which the P-P undergoes no change of state. So the object of *frighten/please* is the better P-P than that of *fear*, while both entail the same P-A properties (Dowty (1991, 579ff.)). *gefallen* and *interessieren* are the least transitive verbs, so that they show a mixed distribution of entailments. Presumably, the fact that the object of both is somehow affected i.e. stimulated by their subjects is the decisive property. It has thus been a skilful measure to list both “undergo change of state” and “causally affected” as P-P properties. It remains open why *fear* has the sentient experiencer as subject and the causing stimulus as object. One has to argue, that sentience “carries more weight” than causing, which seems doubtful and is certainly a wrong generalization (cf. also ch. 5 on the complications with *fear*).

In the foregoing analysis all the advantages and problems of the proto-role theory have surfaced. It is remarkable how well-chosen the particular entailments are, although there are problems with some verbs like *receive* where the distribution of roles seems reverse. The lists combine important insights into the factors that determine linking and even challenge the well-articulated RRG. The entailments are of different kinds, namely do they involve (lexical-)semantic information about the arguments (volition, sentience), although they are designed as verbal entailments. There is (lexical-)semantic information about verbs/predicates ((causing) affection, +/- movement), as well. Incremental themehood is an aspectual property. Independent and dependent existence are difficult to determine (cf. ch. 4.3.3). It seems to be a legitimate question, then, whether an appropriate analysis of verbal and object (as entity) semantics, aspect and pragmatic factors could replace the notion of proto-roles, or in other

words, whether an analysis of these factors make proto-roles and thematic roles in general superfluous and redundant. Furthermore, although the set of entailments proves Dowty’s astuteness, it is not any clearer than traditional role lists (cf. Dowty (1991, 575)). It is unclear whether and how the particular entailments must be weighted. And the suggestion that the entailments “are more straightforwardly relevant to human life” than discrete* roles cannot count as a satisfactory argument in favour of proto-roles. Perhaps the greatest problem is the fact that the entailments function uni-directionally, from verb to arguments, while the locative alternation, for example, shows that this is simply wrong, since definiteness is clearly not entailed by the verb (cf. also discussion of RRG; ch. 3.1.1). Finally, the theory obviously lacks any reference to grammar (apart from the argument selection principle) and case-marking languages and thus completely fails to account for case phenomena as well as for passivization which has not been discussed, at all.

4.3.2.2 Baker (1996, 1997)

Rather loosely related to Dowty’s account is that of Baker (1997, first suggestions from 1996). It will be discussed only very briefly. Baker’s idea was to make use of Dowty’s (1991) concept of proto-roles in favour of a defence of the UTAH*. A combination of these two notions seems rather strange, since the UTAH is highly restrictive, while the proto-roles are rather fuzzy. Could it be that the UTAH itself is not fuzzy “enough” to be maintained so that proto-roles as fuzzy notions must be incorporated into it in order to maintain the UTAH (which was originally established by Baker)? Besides, Baker assumes three proto-roles, the two of Dowty and a proto-goal/path/location (Baker (1997, 120f.)). The proto-agent “is the specifier of the higher VP of a Larsonian structure” (cf. Larson (1988, 353)). The proto-patient/theme “is the specifier of the lower VP.” The proto-goal/path/location “is the complement of the lower VP.” Naturally, they are ordered in a way which mirrors their structural representation: P-A > P-G/P/L > P-P/T.



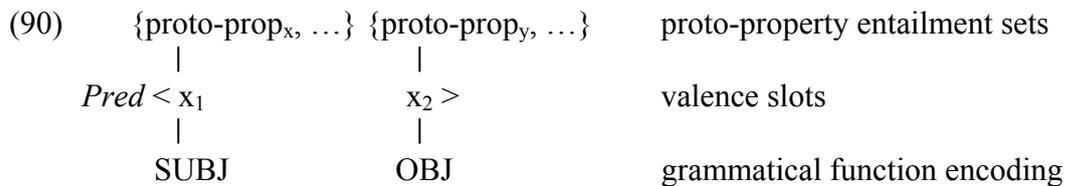
First, although the idea seems interesting, it is not worked out well, since the third proto-role is hardly defined. Second, the above structure trivially has the same problems as that by Larson (1988; cf. ch. 4.2.4). Third, the treatment of indirect objects crucially involves the assumption that they are assigned case by a null preposition (cf. also Pesetzky (1995)). This results not only in the well-known derivation of the double-object construction from the prepositional object construction, but also in an analysis of *helfen* or *gefallen* where the dative argument has an underlying null preposition, which seems rather implausible (cf. also Maling (2001)).

4.3.2.3 Ackerman/Moore (1998, 2001)

The theory of proto-roles by Ackerman/Moore (2001, henceforth AM) is the first to further develop Dowty's (1991) original theory discussed here. The other (and earlier one) is that of Primus (1999 and subsequent), which is discussed in separate section because of its major deviations from Dowty. AM, on the other hand keep closer to the original theory. Because of reasons of space only Primus' theory will be discussed more extensively. Nevertheless, the basics of AM's theory will be presented, as well.

First, there are two modifications of the entailments stated by Dowty. AM (2001, 38ff.) allow negative entailments in order to account for argument alternations with nearly identical predicates. Second, the notion of incremental theme as proto-patient property (cf. ch. 4.3.2.1) is replaced by that of "bounding entity"¹⁰⁰ (AM (2001, ch. 5)). The latter is introduced due to cross-linguistic generalizations (the distinction between partitive and genitive case, e.g. in Estonian) and is closely related to incremental theme and the measuring argument of Tenny (1992) but not to be identified with them (cf. AM (2001, ch. 2.3)). In addition, the application of bounding entity increases transitivity (AM (2001, 87f.)). This leads to the other great deviation from Dowty (1991): Bounding entity distinguishes case-markings on arguments while they bear the same grammatical functions* according to the "syntagmatic argument selection principle", i.e. Dowty's (only) argument selection principle (cf. Dowty (1991, 576)) which determines the grammatical functions of the arguments of the verb. "Within" these classifications there are alternative case-marking possibilities (e.g. a grammatical function "object" may bear accusative or dative case). Therefore a "paradigmatic argument selection"¹⁰¹ is introduced (AM (2001, 172)). The distinction between obligatory and optional arguments is supplied by the association of entailment sets with valence slots in the lexical

entries of predicates (AM (2001, 44f.)).¹⁰² Summed up, linking is dependent on “three levels of information” (AM (2001, 45)) in a lexical entry together with the syntagmatic and paradigmatic argument selection principles. A prototypical lexical entry is given below (cf. AM (2001, 45)). Grammatical encodings include function and case encoding:



With respect to the phenomena one can conclude that the extensions of Dowty’s (1991) theory are very useful to further explain and constrain them. With the idea of paradigmatic selection one could more elegantly account for split intransitivity, if it were more precisely explicated with respect to possible alternations not only between accusative and dative, or genitive and partitive, but also between nominative, dative, accusative (*Ich friere, Mich friert, Mir ist kalt*). Unfortunately, there is again no treatment of passivization. The introduction of valence slots, bounding entity, the involvement of transitivity allows an even more satisfactory and better explicated treatment of the locative alternation than it has been given by Dowty (1991). AM (2001) supply no treatment of the ADOC, but the paradigmatic selection principle – the acknowledgement of a polysemy presupposed – can serve to account for it. Remember, *the pope* was a prepositional object/goal in one, and direct object/recipient in the other construction of the ADOC. If one attributed – according to the paradigmatic selection – more proto-agent properties to the pope in the latter construction, it would become less oblique than a prepositional object, i.e. a direct object in English. In German, it would also become less oblique, i.e. an accusative or dative (*lehren* vs. *senden*), (despite of additional language-specific rules). The treatment of psych-verbs is identical to that of Dowty (1991) with respect to the entailments (decisive role of “change of state”), but again the paradigmatic selection accounts for case phenomena, except the *gefallen-interessieren* distinction. Summed up, AM (2001) supply a well-motivated extension of Dowty’s concept of proto-roles, which only lacks more precise adjustments and explications of the principles involved in order to account for most of the phenomena. AM’s “corresponding theory of argument selection” (AM (2001, sub-title) is in fact a promising account to argument alternation phenomena.

4.3.3 Primus (1999 and subsequent)

The proposal of Primus (1999 and subsequent), although being a further development of Dowty's (1991) proto-roles, deserves its own chapter because of its originality. Primus (2006, 54) distinguishes between "involvement" and "causal dependency", where the former is coded in terms of case¹⁰³, and the latter in terms of structural relationships¹⁰⁴. This idea is related to the tier proposals (cf. also the discussions of Culicover/Wilkins (1986), Jackendoff (1987 and subsequent), Grimshaw (1990), Croft (1991)). Involvement can be measured in terms of Dowty's proto-role entailments (Primus (2006, 55f.)). There is a third proto-role, a proto-recipient (P-R) which accumulates both proto-agent (P-A) and proto-patient (P-P) properties and which behaves like the former with respect to a P-P and like the latter with respect to a P-A. Causal co-argument dependency (the ominous "(in)dependent existence" in Dowty's proposal) can be put this way: the P-P lists the converse properties of P-A based on the principle that "the event denoted by the predicate and the specific properties of the other participants in that event would not obtain", if "a participant would not have a specific property". (Primus (2006, 56f.)). Thus, the condition on the possibility of the presence of a P-P is the presence of a P-A. Agents set themselves in motion by volition. If the cardinal had not put the parrot in motion in order to get it to the pope, then the parrot would not have moved, either. The dependency hierarchy is thus P-A $>_{\text{dep}}$ P-R $>_{\text{dep}}$ P-P (Primus (2006, 60)). Involvement and causal dependency relations are reflected by the formalization of Dowty's entailments (Primus (2002, 7)):

(91) x causes s or some aspect in s	caus(x,s)
x controls s or some aspect in s	ctrl(x,s)
some aspect of y is under control of x	ctrl(x,y)
x is physically active	phys(x)
y is physically manipulated, e.g. moved, by x	phys(x,y)
x experiences a sensory or mental state	exp(x)
x experiences a sensory or mental state relative to y	exp(x,y)
x is in possession of y	poss(x,y)
a. ctrl(x,s) \rightarrow caus(x,s)	
b. exp(x,s) \rightarrow caus(x,s)	
c. p-caus($x,s[y]$) \rightarrow phys($x,s[y]$)	
d. ctrl(x,s) \rightarrow exp(x,s) ¹⁰⁵	

According to the “Nominative Requirement”¹⁰⁶ (NR) in German unergatives and unaccusatives have nominative arguments. Thus, the arguments x of *sterben* and *tanzen* are linked to nominative case.

(92a) *x stirbt.*
 phys (x)
 exp (x)

(92b) *x tanzt.*
 [caus (x, s)]
 ctrl (x, s)
 phys (x)
 [exp (x)]¹⁰⁷

The degree of membership could be obvious in the expression in terms of base predicates, similar to Dowty’s proposal, but Primus (1999, 52f.) states that the argument of *die* has no P-P properties, at all, since there is no P-A, on which it could be dependent. This is valid for all unaccusatives. As a result, the degree of membership is not captured. In ch. 3.1 it has been shown that there are cases of surface unaccusativity in German, as well. In *Mir ist kalt* and *Mich friert* the case-assignment is semantically motivated (Primus (1999, 67)) but the nominative requirement is overridden by the “Principle of Morphosyntactic Expression of Thematic Information”¹⁰⁸ (PMETI, Primus (1999, 61)). The “Dative-Default” says that a syntactic argument in the dative has a small number of P-A properties in its semantics (Primus (1999, 66)) and a corollary of the PMETI says that fewer P-A properties tend to be coded not by nominative case, but by dative (cf. note 46). There are no hard criteria which govern in which cases grammatical principles like the Dative-Default may override the NR. Thus, these cases are lexically governed (cf. Primus (2002, 18; 2006, 67)). This account to split intransitivity is better worked out than that of Dowty (1991), especially with respect to grammatical requirements, but in principal it works similarly. What is remarkable here is that Primus attempts to trace back at best all grammatical phenomena to semantic information. The PMETI embodies this attempt but competes with grammatical requirements which tend to code whatever information in terms of maximal distinctions. With respect to split intransitivity it has turned out that grammatical constraints are stronger, with surface unaccusativity the PMETI is stronger, but only in German.

Related to this is passivization, which has as primary property the demotion of the P-A, and at least in German the optional promotion of a P-P as secondary property (Primus (1999, 224)). The promotion property (when applying, at all) depends on the “Subcategorization Principle”¹⁰⁹ and the nominative requirement. Demotion is characterized as a discourse-pragmatic property. Active and corresponding passive sentences have the same thematic structure, which does not lead to a violation of the PMETI because the agent in the passive is

no syntactic argument (cf. note 51). In sum, the passive is expressed by the same base predicates as the active, but the verb has a reduced valence. If promotion of a P-P applies, then, because the NR overrides the PMETI. Thus, the basic questions asked in ch. 3.2 are satisfactorily answered by Primus. The application of passivization is restricted by the presence of a P-A, is motivated by discourse-pragmatic factors (prominence of P-P), and its grammatical structure is governed by several principles: the PMETI, NR, Subcategorization Principle, case and proto-role hierarchies (cf. notes and above in this section). The different rankings of the NR and the PMETI can best be captured in terms of optimality-theoretic constraints, what in fact is done by Primus (1999, 2002, 2006). A certain degree of idiosyncrasy remains and a treatment of the *bekommen*-passive is not supplied, since there are presumably no means by which the latter could be dealt with structurally (i.e. in terms of Larson's (1988) VP shells, cf. ch. 4.2.4). A semantic description of a P-R promotion should be possible, where a promoted P-R (nom) in the *bekommen*-passive has possibly less P-A properties than a non-promoted P-R (dat) in the *werden*-passive, i.e. *Er bekam den Papagei gesendet* vs. *Ihm wurde der Papagei gesendet*.

With respect to the ADOC* Primus (2006, 72) recognizes semantic differences between both. The prepositional object-version is not dealt with but is provisionally analysed as a “movement of *z* (*parrot*) to *y* (*pope*)”, while the double object construction is a “change of possession of *z* to *y*” which also includes the involvement base predicate [$\text{exp}(y, z)^{s2}$] and [$\text{poss}(y, z)^{s2}$] where [$s2$] denotes the second proposition contained in the ditransitive predicate (cf. Primus (2002, 8f.)). The prepositional object-version lacks both P-A properties and thus is less likely to be coded as dative (in German) or direct object (in English). It seems that Primus' account ignores the problem of this construction, since an OT*-account is mainly interested in the optimal candidate which is clearly the double object construction, according to the constraints “No Dative” (for English) and the “Dative Constraint” (for German) (Primus (2002, 20f.)). In order to account for the fact that a dative argument accumulates a small number of P-A properties whereas a prepositional object accumulates fewer or none, at all, one would have to change the whole system, because the causal dependency relations must also be maintained. Why is the thing moving (in any case the P-P) causally dependent on the addressee (presumably in any case the P-R) when the latter is realized as a prepositional object and lacks crucial P-A properties including the decisive one [$\text{exp}(y, z)^{s2}$] which determines causal dependency.

Naturally, there are the same problems for the *load* NP *on* NP-version of the locative alternation since this is presumably similarly analysed as movement from *z* (*bottles*) to *y*

(wagon). The *load* NP *with* NP-version does not state any problems since the PP is optional and no P-R is present. The loader-argument is a “good” P-A and the loaded-argument a “good” P-P. The same problems can be observed here as well as in Dowty’s (1991) account. The entailments that are derived from the verb are not sufficient to capture the semantics/a complete interpretation of a simple sentence (core + arguments). Some properties of objects (entities) entail some aspects of the meaning of the sentence independently from the verb (cf. table 3.4).

The base predicate [exp (x, y)] denotes the fact that a stimulus *y* is causally dependent on an experiencer *x* because of the fact that the way the stimulus is involved in a situation “depends on the kind of involvement of the experiencer, i.e., on the question whether he or she smells, sees or likes” (Primus (2002, 57)) something. The crucial property for experiencers is sentience, then, and for stimuli causation [caus (x, s)]. This means that the treatment of psychological verbs is strongly resembles that of Dowty (1991, cf. ch. 4.3.2.1). Subject-experiencer verbs behave like transitive action verbs, which is indicated by the rightmost column in table 3.5 in chapter 3.5. Causative stimuli together with object-experiencers also behave like transitive action verbs, exceptional *fear* which is treated similar to *like* and *hate* by Primus (2006, 77) despite its semantic peculiarities. The most interesting cases are those in which the stimuli cannot be interpreted as volitional. *gefallen* and *interessieren* allow this and at least the former shows a case pattern that reflects this reduced transitivity (Primus (2006, 75ff.)). One question remains open, though. Primus (2002, 8) states as one of the unilateral implications among the base predicates the following: [exp (x, s) → caus (x, s)]. Now what distinguishes causative stimuli from non-causative stimuli is the presence of [caus (x, s)] as a P-A property. The experiencer remains the same ([exp (x, s)]). But the above implication implies that all experiencers are causers. But this means that in any case experiencers would accumulate more P-A properties than stimuli. And how is it possible that both a stimuli and an experiencer are causers in the same sentence? It seems, then, that the implication above cannot be correct. Anyway, the OT-table (taken from Primus (1999, 69) for the optimal case patterns for psychological verbs is given below.

	$\lambda y \lambda x$	exp (x,y)	Distinctness	Nominative Requirement	Dative Default	nom/acc-preference	nom- P-A acc-P-P
	x	y					
a)	nom	acc			*		
b)	acc	nom			*		*
c)	nom	dat			*	*	*
d)	dat	nom				*	*

Table 4.8: *Optimal case patterns for psychological verbs in German*

The three constraints in the right column are ranked equal, so a)-d) are the possible candidates in German. Other candidates violate either the Distinctiveness or Nominative Requirement constraints and are subsequently left out here. It must be noted, that nothing consistently explains the different behaviour of *gefallen* and *interessieren*.

In conclusion, some problems remain, apart from those about the prepositional object-version of *send*, the uni-directional entailments, and the cases of *gefallen* and *interessieren*. First, some intuitively implausible results can be observed. The second argument of *töten* is a P-P but not the only argument of *sterben*. This is true also for other pairs of this sort. Second, and depending on the same theoretical aspect, arguments with seemingly similar proto-role entailments are analysed as P-A and P-P, only distinguished by the causal dependency. So the first argument of *resemble* is a P-A, while the second is a P-P. At this point, a constructional solution (dependent on perspectives) seems more plausible. Third, there is nothing prototypical in the proto-recipient, since a reduction of its proto-recipient properties results in being no more a proto-recipient, especially in case of the difference between a recipient and a goal. (Fourth, the introduction of [poss (x, y)] prevents the possibility of an optimal P-A, since no argument can accumulate all P-A properties any more (cf. Kailuweit (2003, 89ff.)).

Nevertheless, Primus has remarkably modified and worked out the ideas of Dowty and especially the principles used (e.g. the PMETI) are of great cross-linguistic significance. In general, the advantages of Primus' theory lie in its universal applicability which unfortunately did not turn out throughout this discussion which was mainly based on German or English.

Thus, it can be concluded that generalized thematic role solutions are a promising way to deal with the problems stated by the phenomena presented throughout chapter 3. Each of the discussed theories has great advantages: The proto-role theory assembles much information of different kinds, e.g. aspectual, lexical semantic, ontological considerations. Proto-roles therefore capture many aspects that obviously govern the mapping of arguments. Compared with the other theories discussed in this chapter proto-roles nicely capture different degrees of membership of verbs in verb-classes, depending on the entailments that hold with respect to the arguments of the verb. Macroroles, in opposition to proto-roles, are purely interface notions derived from well-defined lexical structures of verbs based on a detailed analysis of aktionsarten. The linking in RRG thus crucially takes into account the notions of transitivity and aspect which are coded in terms of macroroles and the AUH. The theoretical status of the macroroles is thus less problematic than in other theories. The basic properties of the

phenomena discussed could be satisfactorily explained by the theories, but each of the phenomena holds additional difficulties when analysed in detail. In special, the ADOC* states difficulties for all theories discussed (i.e. the prepositional object-version for the proto-roles and its passivization for RRG. Additionally, some psychological verbs, especially the *interessieren*-class (and in part *fear*), have obviously idiosyncratic properties which require a special treatment in terms of lexical peculiarities. With respect to theoretical matters, all of the theories assume a relationship between predicates/verbs and arguments that is rather unidirectional and mono-causal, which seems highly questionable. To sum it up, it is an advantageous development that has taken place, from a mainly structurally determined linking to theories of linking that crucially refer to semantics. Generalized thematic roles avoid the problems of discrete* roles and supply an explanation for the different formulations of thematic hierarchies. Principles like the UTAH* which rely on the assumption that there are strong generalizations possible between semantics and syntax can be strengthened by this conception of thematic roles.

4.4 Feature decomposition as solution

Finally, another solution shall be outlined rather briefly. It involves the decomposition of the contents of thematic roles in terms of particular features. This is thought to solve the problem of the granularity, the number and the content of thematic roles.¹¹⁰

4.4.1 Wunderlich (2000 and subsequent)

Although Wunderlich's Lexical Decomposition Grammar* (2000 and subsequent) is not a prototypical theory making use of feature decomposition* it is outlined here. It is appropriate to present LDG in this chapter rather than treating it as discrete* role theory, thematic role hierarchy* solution or generalized* role solution.

The architecture of the theory has already been presented in ch. 2.2 (figure 2.2). According to this, the grammar consists of four representations. First, there is conceptual structure (CS) consisting of extra-linguistic knowledge. Semantic form (SF) consists of that part of CS that is linguistically relevant, following the principle of minimality (Wunderlich (2000, 249ff.)). In conceptual structure, the thematic roles of arguments of a verb are specified and the decomposed verbal semantics including its event structure. SF only consists of the decompositional part. The relationship between CS and SF is constraint by several principles

(Wunderlich (2000, 252)).¹¹¹ More important is the mapping between SF and morphology/syntax (MS). The decomposition makes use of a binary branching which determines the ranking of the arguments in the decomposed structure. The highest argument and the lowest argument in this structure are relevant for the linking between semantic and syntax. Between SF and MS there is another representation, theta-structure (TS) which is necessary for operations on argument-structure, for asymmetries between semantics and syntax (e.g. expletives) and for linking idiosyncrasies. TS “reads off” the prominence relations from SF in terms of the following features and λ -operators¹¹²:

- (93) lowest argument in SF: [+ hr, - lr] for “there is a higher role , there is no lower role”
 highest argument in SF: [- hr, + lr]
 intermediate arguments: [+ hr, + lr]

Between TS and MS there is some kind of θ -criterion for feature decomposition, according to which each feature in TS occurs in MS and each case in MS is derived from TS. The features above are linked to case in the following way:

- (94) nominative: []
 accusative: [+ hr]
 dative: [+ hr, + lr]

These three cases are, in contrast to most theories, structural cases. Plus-marked cases are marked, non-plus-marked cases are unmarked with respect to the possible contexts in which they occur (e.g. nominative occurs in nearly every context, dative only in some special ones). The linking in terms of structural case can be overridden by non-default semantic case. With this architecture the linking can be explained in the following way (cf. Wunderlich 2001a, 6):

- | | | |
|---|-----------------------------|-------------------|
| (95) a. ditransitives: | b. transitives: | c. intransitives: |
| $\lambda z \quad \lambda y \quad \lambda x$ | $\lambda z \quad \lambda x$ | λx |
| + hr + hr - hr | + hr - hr | - hr |
| - lr + lr + lr | - lr + lr | - lr |
| acc dat nom | acc nom | nom |

This is only the default linking and this pattern can be changed by adding lexical case features to the structural ones. A brief indication of the treatment of the phenomena: The above intransitive representation accounts both for unergatives and unaccusatives. Surface unaccusativity results, if a lexical [+ hr] applies which yields accusative case (96a). Degrees of membership cannot be captured. If passivization applies, λx is prevented from being realized in MS, yielding a nominative marking of the previously accusative marked λz . A nom-dat pattern results from the addition of a lexical [+ lr] (96b) (Wunderlich (2003, 11)):

(96a) verb (x) λx	(96b) verb (x, y) $\lambda y \quad \lambda x$
lexical: + hr	lexical: + hr
default:	default: + hr
	- lr + lr
acc	nom dat

The ADOC works as follows (abbreviated) (cf. Wunderlich (2005, 42)):

(97) a. $\lambda z \quad \lambda y \quad \lambda x$	b. $\lambda P \quad \lambda z \quad \lambda x$
acc dat nom	PP acc nom
based on: [ACT (x) & BEC POSS (y, z)]	[ACT (x) & BEC LOC (z, AT y)]

The prepositional object is more deeply embedded in SF, so that this is also reflected by the argument realization in MS. In principle, the locative alternation works similarly but deviates from this in the choice of preposition. There is also a difference in the depth of embedding with respect to y and z which is overtly realized. Psych-verbs, as indicated above, make extensive use of lexical case features, as indicated in (96b) above. LDG elegantly avoids the classical problems of thematic roles (see summary of ch. 4.1 & 4.2, 4.5) by treating them only relationally. The semantics of the case system is nicely captured by the case features which have semantic implications. This can be seen, e.g. with the dative which has an intermediate status between an agent and a patient indicated by its features [+ hr, + lr]. Even the lexical case features which are added to the default distributions of the features are semantically motivated, since [+ lr] indicates some kind of agentivity or control and [+hr] indicates some degree of affectedness (cf. Butt (2005, 115)). Both increase the markedness of the particular argument. The default patterns given in (95) must be justified by a well-explicated typology of verb-classes with more or less prototypical ones, if this is possible, at all (cf. Wunderlich

(2005)). Although the thematic roles are decomposed in terms of features and case plays the more important role, CS makes use of discrete thematic roles, so the theory has to face the theoretical problems discrete role theories also have to deal with. In sum, LDG explains a great range of phenomena and is superior to most of the other theories with respect to its explanatory power but it needs to be embedded in a well-explicated theory of grammar. The influence of aspect on linking must also be incorporated into the theory (cf. Wunderlich (2005)). Nevertheless, LDG describes a highly promising way to deal with the linking problem.

4.5 Grand summary

In the second chapter it has been outlined which development has led to the invention of thematic roles (ch. 2.1). As main stages Pānini and, 2,500 years later, Blake (1930) were mentioned who first recognized and investigated the regularities between form and meaning. The work of Frege in formal semantics has supplied further aspects which should become important with respect to the linking problem for which the Chomskyan linguistic revolution and his thesis of the autonomy of syntax were the basis. After having outlined the history that has led to the modern version of the linking problem a provisory and rough definition of thematic roles* was supplied as working hypothesis (ch. 2.2). Furthermore, it has been cleared up what the purpose of thematic roles is, which the roles are and which different conceptions of roles exist. The latter include the questions which kind of knowledge is involved in the semantics-syntax linking, what the cognitive significance of thematic roles is, whether they are structural or semantic in kind, whether they are primitives, composed, holistic. Further question have been where thematic roles are linked to and the main developmental stages haven been outlined. The assumption that thematic roles can be dismissed in favour of a purely aspectual linking has been rejected. Nevertheless, there is undoubtedly a strong relationship between the notions of thematic roles, aspect/*aktionsarten*, transitivity and maybe case. The bunch of information in this chapter was considered to supply the theoretical prerequisites for the discussion of the language phenomena in the later chapters.

Before discussing the phenomena they have been extensively presented with all the different tasks they set with respect to theories of linking (ch. 3). Split intransitivity (ch. 3.1) is a task for principles like the UTAH* since different semantic representations (prototypical agents vs. prototypical patients) are (apart from surface unaccusativity) represented identically in (surface) syntactic structure. Especially monostratal theories have to explain the

generalizations that unergatives behave differently from unaccusatives. Their behaviour with respect to auxiliary selection and passivization indicates that the membership in one of the verb-classes is a matter of degree. The application of passivization (ch. 3.2) is obviously thematically restricted. This can at best be captured by a thematic hierarchy, since the restrictions cannot be explicated in terms of a single or two discrete* roles. It is rather the ranking of roles that plays a crucial role. Another question is why there are semantically (nearly) identical sentences which have contrary syntactic realizations which in turn violates the UTAH*. The locative alternation (ch. 3.3) supplies different syntactic constructions for similar events which involve contrary distributions of the roles location and theme. Contrary to the passive one construction cannot be simply derived from the other since the constructions clearly have different meanings. The task has been not only to explain thematic differences but also aspectual ones and the crucial involvement of the definiteness of the arguments of the verb. What is the alternation between accusative and PP for the locative alternations is the alternation between double object (involving dative case at least in German) and prepositional object for the alternation* with double object constructions (ADOC, ch. 3.4). Two syntactic constructions describe an event of a more or less prototypical transfer. There is again an alternation between at least two roles (goal and theme or recipient and theme or recipient, theme and goal). The derivation of one version from the other is problematic since there are presumably semantic differences between both versions (which is not universally accepted (and valid)). The phenomenon shows additionally some peculiarities with respect to passivization and case. Finally, psychological verbs (ch. 3.5) are presumably the most challenging phenomenon. They show a great variation with respect to the order of roles in their basic realization patterns (experiencer > stimulus; stimulus > experiencer), case patterns, aspectual properties and behaviour with respect to passivization which has brought about a great number of solution trials. Connected with the conception of thematic roles (cf. ch. 2.2) is the question whether psychological verbs are treated differently from concrete action verbs, at all, or whether they can be treated identically. It seems that the phenomenon cannot be described without a) introducing more and more roles or b) reference to aspect and *aktionsarten* of the involved verbs.

Chapter 4 has turned to the discussion of particular theories of linking, ordered according to their developmental stages. The discrete role theories discussed (ch. 4.1, mostly more than one account from Aspects*/P&P*/Minimalism*, Case Grammar*, Relational Grammar*, Cognitive Grammar*, LFG*, (HPSG*)) are characterized by the attempt to simplify the semantic interpretation that is projected from syntax rather than by the attempt to capture

linking generalizations. This characteristic is tied with the “syntactocentrism” of these early theories. Much information has been captured in terms of the lexicon, like the invention of the external argument. Exceptions from this tendency are Fillmore and Jackendoff who have firstly recognized the importance of semantics for linking. As a result, most of the phenomena are explained in terms of thematic roles, but with the crucial involvement of idiosyncratic lexical information. In addition, the theories differed very much with respect to the particular roles and how they are defined. Hierarchies* of thematic roles (ch. 4.2, including proposals from Jackendoff, Construction Grammar*, LFG-LMT*, P&P*/Minimalism*, (OT*)) fairly solve some problems stated by discrete role accounts. Phenomena like passivization and the ADOC* could better be described and explained in terms of prominence relations among arguments. Unfortunately, most of these proposals have taken over the problems of discrete role theories. Again, the roles included in the theories have differed in number and content, and in addition there was absolutely no agreement with respect to the correct hierarchical ordering of the roles. Especially the multi-dimensional* approaches to thematic roles, involving aspectual information and the distinction between action and spatio-temporal notions showed up to be a promising concept because they avoided co-occurrence problems with particular roles. Additionally, e.g. the locative alternation can be described as involving an action-reading and a spatio-temporally organized reading. Up to the present day generalized* thematic roles (ch. 4.3) seem to be the most appropriate solution for the problems of linking. The problems concerning number, kind, content and hierarchies of the roles could be eliminated, although there are considerable differences in the conceptions of generalized roles, especially between Dowty and successors and van Valin and successors. The advantages of proto-roles lie in the involvement of several kinds of semantic information that are included in the entailments of the verbs. In addition, the “grammatical part” of Ackerman/Moore’s and Primus’ proto-role theories is very well-formulated. Some problems remain with the concept of entailments, theoretically, and with parts of the ADOC and seemingly idiosyncratic case phenomena (surface unaccusativity & *interessieren*-class of psych-verbs), empirically. RRG linking takes into account transitivity and aspect/aktionsarten to a high degree, which makes it superior to most of the other theories. Interestingly, the theory has the same problems as Primus’ proto-role account. It is not clear, whether this is due to the fact that the remaining problems indeed cannot be referred to any semantic factor or whether this factor has not been found, yet. Feature decomposition* of the sort of LDG* also seems to be a promising way to deal with the linking problem, since it crucially involves the semantics and the markedness of case. On the other hand it presupposes a typology of verb-

classes (default vs. marked) which needs to be explicated throughout future research. In addition, LDG is not yet able to completely leave the notion of thematic roles out of the theory.

With respect to the hypothesis according to which regularities of syntactic structure are semantically motivated (see ch.1, initial sentence) one can at last state the following: The strong impression that the reference to semantics entails an increase of explanatory potential of the theories proves its correctness. However, since the semantic factors involved in the semantics-syntax linking more and more become clear it is not implausible and improbable that the notion of thematic roles can be replaced by a well worked-out theory of the interaction of these factors. RRG, it seems, has come closest to this goal, since its conception of macroroles resembles these factors to a higher extent than the classical concept of thematic roles. Nevertheless, only the direction of research has correctly been identified, yet. And there is much to investigate beyond split intransitivity, argument alternations and psychological verbs.

5. Some considerations about linking without thematic roles

It must be emphasized here, that the ideas presented in this chapter are only provisory and not well worked out. They are only suggestions what a theory of linking that does not involve thematic roles could look like. The syntactic component is not worked out, at all. What can be said so far is that case plays the crucial role in linking and that grammatical functions will not be used.

There is no doubt that the verb is the principle variable upon which the syntactic structure of a sentence depends. The verb describes an event and therefore it surrounds itself with the participants of this event which are arguments of the verb. In order to mark the information of *who does what to whom* among these participants, the verb “selects” its arguments and determines their morphosyntactic coding (x, y, z).

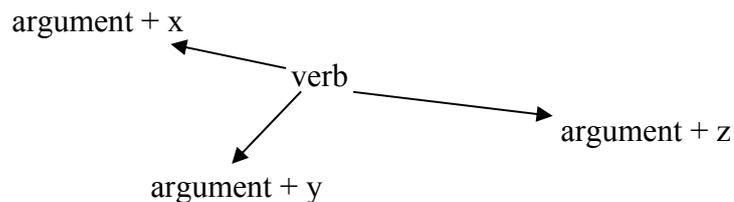


Figure 5.1: *Centrality of the Verb in Syntax*

But there are reasonable doubts that the unit that corresponds to the syntactic unit “verb” – let us call it “event” or “action” – is the basic unit, semantically. It is a mistake to consider the dependency relations among the semantic units “event” and “participant_{1-n}” to be identical with the dependencies among the syntactic units “verb” and “argument₁₋₃”. There is no parallelism, at all. But almost all theories of linking posit the centrality of the event, semantically, analogous to the centrality of the verb, syntactically. Gruber (1965) has an “Event”-node in his Prelexical Structure. Fillmore (1968) has a node “Proposition” which consists of the verb and the deep cases, i.e. the event and its participants. In van Valin’s (2005) theory the semantic structure is based on lexically decomposed verbs; Dowty (1989, 1991) and Primus (1999 and subsequent) work with entailments of verbs. So they all posit a parallelism between syntax and semantics with respect to the above figure. They posit the same dependencies among an “event” and its “participants” as they do it for the verb and its arguments. But how is this motivated? The reason for the centrality of the verb in syntax is

clearly the coding of the information of *who does what to whom*. It must be coded since the verb is a cluster concept consisting of different information. The morphosyntactic coding makes the relations between the verb and its arguments (and among the arguments) overt and obvious. But in a presumed semantic representation in a grammar there is no need for such coding properties, since semantics serve to supply the semantic interpretation or to derive the syntactic representation. The arguments for assuming the centrality of the verb in syntax do not work for semantics. The centrality of the verb need not exist in semantics.

It rather seems that an event is no semantic primitive as opposed to most of the objects. It is a cluster of information of different kinds. For example, the event of “sending” (subject to the ADOC*) consists of the information that

- there must be a “sender”,
- the “sender” must be animate,
- the “sender” must control the action,
- the “sender” causes sth. to change its state, i.e. it affects the entity sent,
- the entity sent undergoes movement from somewhere to somewhere,
- there must be a receiver
- the receiver is the goal of the movement of the entity sent.
- the receiver must be animate, at least metonymically.
- the receiver may or may not be involved in the event as the *conditio sine qua non* of a “successful giving”
- etc.

Thus, it is clear that an event is a composition of different pieces of information and the possibility of the existence of an event of *giving* is dependent on most of the above aspects. This is summarized in the argument below.

1. Events are cluster concepts of different information
2. Objects (as ontological, not grammatical entities) are necessarily included in concepts of events
3. Objects) are logically preceding events
4. Verbs are composed as relations among objects (via CONCEPTUAL UNITS, lexical, Qualia, & event specifications, see further below)

Therefore, the proposal is that objects (henceforth “primitive (ontological) units”) are the central units in semantics. I will call them primitive units because “participants of the event” states the wrong dependencies. It is the event that is dependent on those units. Objects are primitives at a higher degree than events. There are lexical features associated with the primitive units. So the primitive unit *the parrot* has the features “definite”, “animate” and so on. If *the parrot* was conceptualized before the event, the kind of event would be restricted because *parrot* cannot serve as something that is driven, that shines, or gets broken (literally). Probably, primitive ontological units are conceptualized first, and they describe a particular relationship among each other that is abstract in kind and consists of information such as the above with *send*. There are Conceptual Units associated with the primitive ontological units according to their lexical features, i.e. because a “sender” must control the action the “sender” must be animate. In the case one associates *the cardinal* with “CONTROL” the status of controlling something is restricted by the feature “animacy”. So, if *the cardinal* is conceptualized with the Conceptual Unit CONTROL₊, the result will never be the event of intransitive breaking_{intr}, since this event is defined by the lack of control. A window may break. But it seems odd to say that a child breaks intentionally (one of the implications of CONTROL₊). The Conceptual Units are the following:

CONTROL₊:

An individual *x* is the argument of CONTROL₊, iff the speaker holds it maximally responsible for the event, e.g. *The man in the man assassinated the president.*

CONTROL₀:

An individual *y* is the argument of CONTROL₀, iff

- a) *x* is at least the argument of CAUSE_{csqn},
- b) the speaker holds it not maximally responsible for the event,
e.g. *the boy in Peter gives the boy the parrot.*

CAUSE_{cos}:

An individual *x* is the argument of CAUSE_{cos}, iff it causes a change of state in another individual, e.g. *the car accident in The car accident killed the family.*

CAUSE_{csqn}:

An individual x is the argument of CAUSE_{csqn}, iff it is the *conditio sine qua non* of the event – without x no event (e.g. cf. Primus’ (2006, 56f.) concept of causal dependency), e.g. *shit* in *Shit happens*.

BE.IN.MOVEMENT:

An individual x is the argument of BE.IN.MOVEMENT, iff all individuals conceptualized undergo some movement and where one of them is related to the other, e.g. both arguments in *The parrot follows the pope*.

BE.IN.STATE₊:

An individual x that is part of some concept – alone or in a particular relation with another individual – is the argument of BE.IN.STATE₊, iff it is, or is caused to be, in a state of some kind of maximal affection, e.g. *the president* in *The man assassinated the president*.

BE.IN.STATE₀:

An individual x that is part of some concept – alone or in a particular relation with another individual – is the argument of BE.IN.STATE₀, if it is, or is caused to be, in a state of (not maximal) affection, e.g. *der Papst* in *Der Papagei gefällt dem Papst*.

These Conceptual Units are considered reflecting the basic categories humans use to classify what happens around them in the world. The logical relationships among the CUs are given in the table below.

	is hold responsible	causes a change of state	is the <i>conditio sine qua non</i>
arg. of CONTROL ₊	+	(+)	+
arg. of CAUSE _{cos}		+	+
arg. of CAUSE _{csqn}			+

Table 5.1: *Implications among the Conceptual Units*

The hierarchy that is implicit in the above table and a further hierarchy are expressed in (1) below. In addition, the familiar case hierarchy in (2) is proposed:

(1a) CONTROL₊ (>_{dep} CAUSE_{cos}) >_{dep} CAUSE_{csqn}

(1b) CONTROL₊ >_{dep} CONTROL₀/BE.IN.STATE₀ >_{dep} BE.IN.MOVEM./BE.IN.STATE₊

(2) nominative > dative > accusative, where maximal transitivity is supplied when the

outmost cases in the hierarchy are realized as the arguments of a verb and [BECOME] applies

Note that ditransitive constructions in RRG and in Primus' theory were analysed as containing two propositions: In RRG, there is the first argument of [do' (x, ...)] that is external to another proposition expressed by [pred' (x, y)]. In Primus' theory the proto-recipient is a proto-patient of the first, but a proto-agent of the second proposition which is causally dependent on the first. The theory presented here also assumes that the intermediate argument, represented as argument of CONTROL₀ or BE.IN.STATE₀, has reduced properties of the argument CONTROL₊ or reduced properties of the argument of BE.IN.STATE₊. In addition the intermediate argument is existentially dependent on the higher one and the low argument is dependent on the intermediate.

There is yet another part of this conceptual structure that will only briefly be presented since is not well worked out, yet. Conceptual Units are associated with sub-events of a matrix-event structure. The sub-parts of conceptual composition are summed up in the representation below:

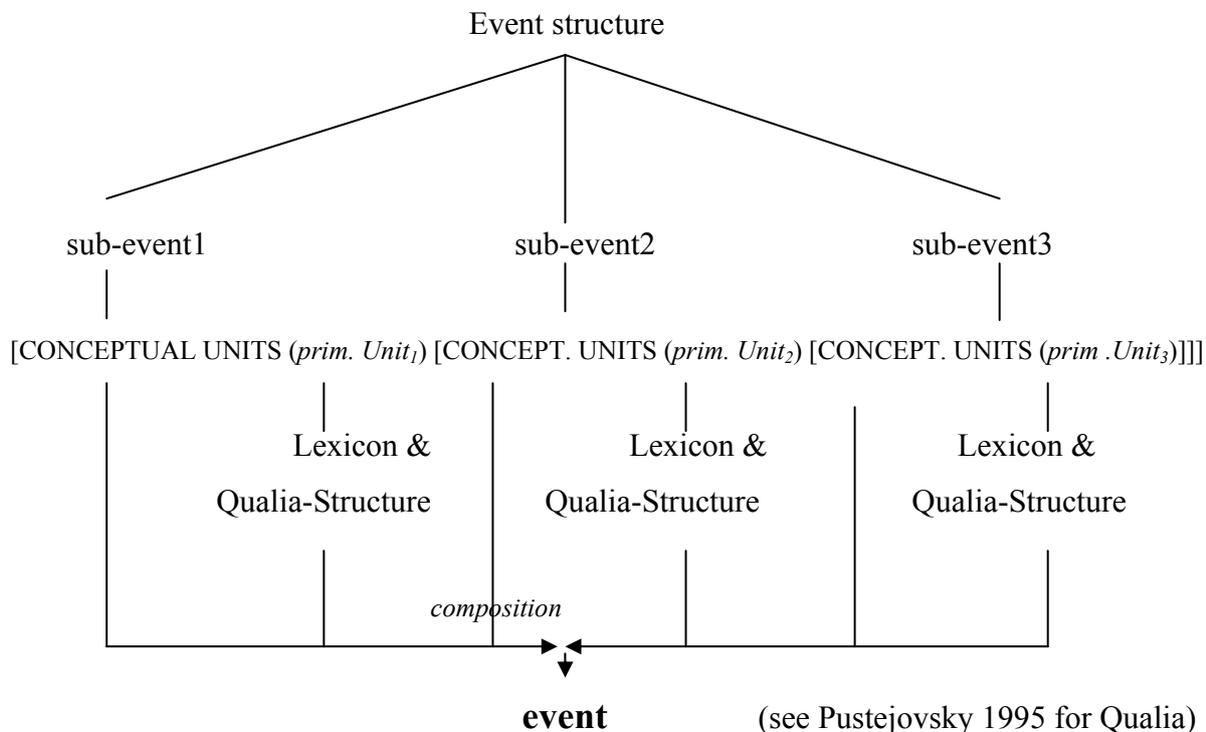
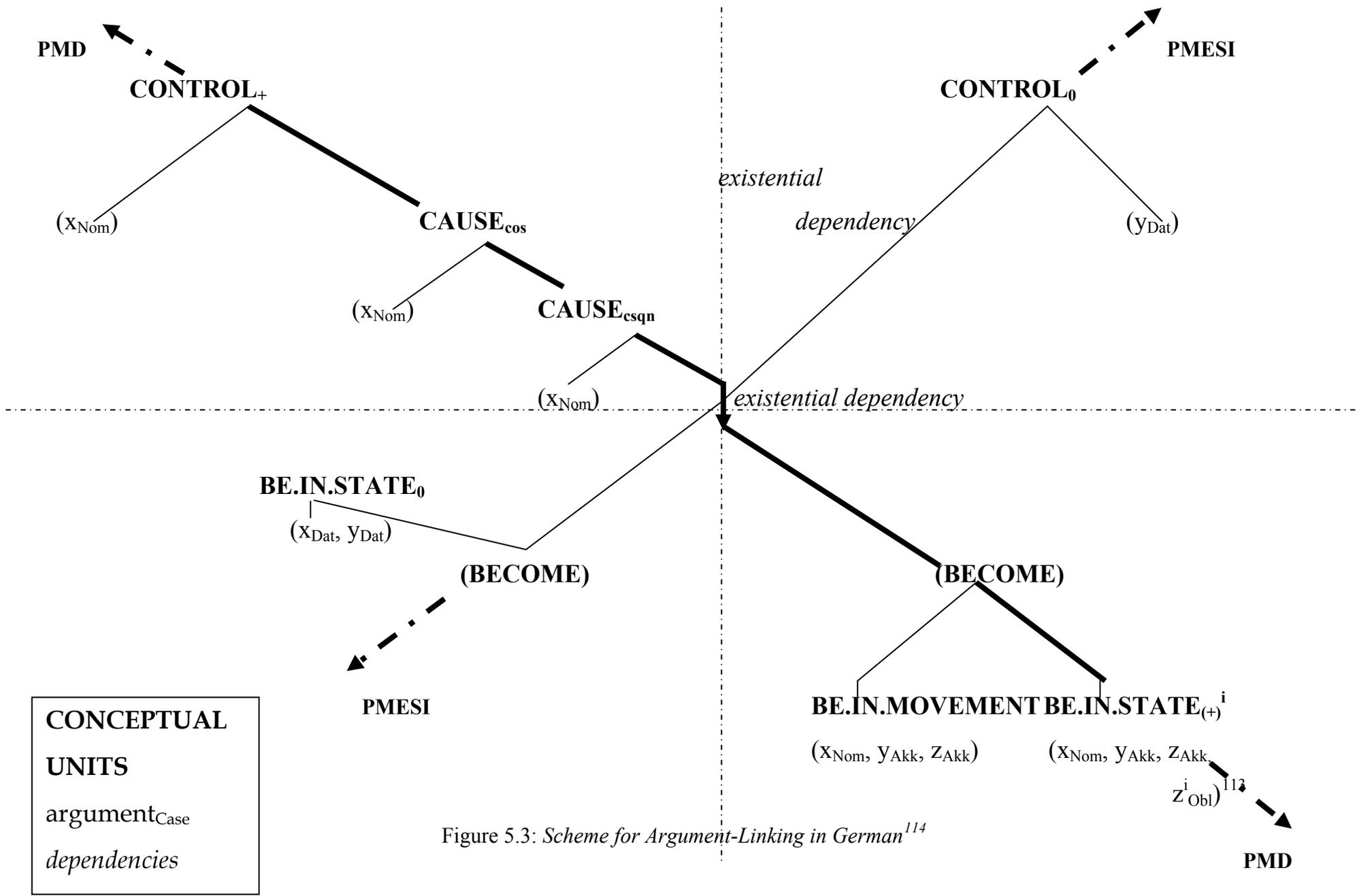


Figure 5.2: *Abstract representation of conceptual composition*

Further above it has been indicated that primitive ontological units are linked to morphological cases, the event is lexicalized as verb. The dependencies among the Conceptual Units and the linking of arguments to cases are given in the scheme for argument-linking in German below:



In the figure above two presumably cognitively motivated principles that are working are indicated by the abbreviations “PMD” and “PMESI” (cf. Primus’ (1999) PMETI, this work, ch. 4.3.3) which can roughly be stated as follows:

(3) Principle of Maximal Distinctiveness:

Syntactic arguments are coded in such a way that they are maximally distinguishable due to maximal transitivity (cf. Hopper/Thompson (1980), Tsunoda (1981)).

(This means the preferred case pattern for transitive verbs is nom > acc).

(4) Principle of Morphosyntactic Expression of Semantic Information:

Distinguishable semantic information is coded by distinguishable syntactic units.

Obviously, the PMD and the PMESI may work against each other orthogonally. While the PMD “stretches” the representation in figure 5.3 towards maximal transitivity and a nom > acc-pattern, the PMESI rather “contracts” it in order to express information represented, for example, by the Conceptual Units CONTROL₀ and BE.IN.STATE₀, involving a dative. For example, one could analyse the case pattern of *gefallen* as an effect of the PMESI, since the object is bears dative case according to its semantics and at cost of morphosyntactic distinctiveness. In contrast, with *interessieren* it is the other way around (cf. ch. 3.5). The case assignment principles are indicated by the table below.

	Maximal	Not maximal
CONTROL	= CONTROL ₊ nominative	= CONTROL ₀ dative
BE.IN.STATE	= BE.IN.STATE ₊ accusative	= BE.IN.STATE ₀ dative

Table 5.2: *Conceptual Units and case assignment*

Before turning to a very provisory treatment of language data, there must be a note on “responsibility” as a grammatical category. This notion plays a crucial role in the characterization of arguments in terms of Conceptual Units. The argument runs as follows:

1. Actions constitute social practice among people.
2. Actions are distinguished from behaviour in that they are purposeful (goal-directed).
3. Responsibility for actions is taken as well as assigned.
4. Speaking is acting.

5. So speakers take and assign responsibility for utterances.

The conclusion (5) perfectly fits Holisky's (1987) pragmatic principles according to which causers and causer-themes are interpreted as volitional. In other words, they are made responsible if they are human. Apart from this it is absolutely natural that pragmatic factors have syntactic effects, e.g. with respect to asymmetries between first & second vs. third person pronouns (cf. Mühlhäusler (1990)). While the former are deictic, third persons are anaphoric most of the time (cf. Siewierska (2004)). They are involved, for example, in passivization in Washo. Passivization in this language is possible only with third person. Due to the human nature, then, and if agents are responsible for actions, absent people are easier to be made responsible for what happens... The speaker makes rather the hearer responsible than himself. So, the following person hierarchy results (a ranking between singular and plural cannot be made here due to the early developmental stage of this proposal):

(5) Hierarchy of persons most likely to be assigned responsibility.

$$3^{\text{rd}} > 2^{\text{nd}} > 1^{\text{st}}$$

And there are indeed phenomena that indicate the correctness of such a thesis. Therefore passivization will be treated first. The rule for its application can simply be stated as follows:

(6) The Rule for Passive:

Passivization applies, if x is at least the argument of $\text{CAUSE}_{\text{cos}}$.

(Therefore, passivization is possible, if an argument of CONTROL_+ or $\text{CAUSE}_{\text{cos}}$ is present (cf. table 5.1). It will fail, if there is only an argument of $\text{CAUSE}_{\text{csqn}}$).

In the chapters 3.2 and 4 it has been shown that the classical analysis of passivization involves some kind of Thematic Hierarchy Condition (like that of Jackendoff (1972)) or the presence of a generalized agent:

(7) *kill* (agent, patient), $\text{ag} > \text{pat} \rightarrow \text{Passive}$

According to this analysis the prediction for the psychological verb *fear* is that passivization is prohibited. This is clearly wrong, as the following sentences show:

(8) *fear* (experiencer, causer) exp < caus → no passive

(8') *Kinder fürchten Kardinäle.*

(8'') *Ich weiß, dass Kardinäle von Kindern gefürchtet werden.*

According to the theory presented here, *Kinder* gets assigned CONTROL₊ while *Peter* in (9) does not:

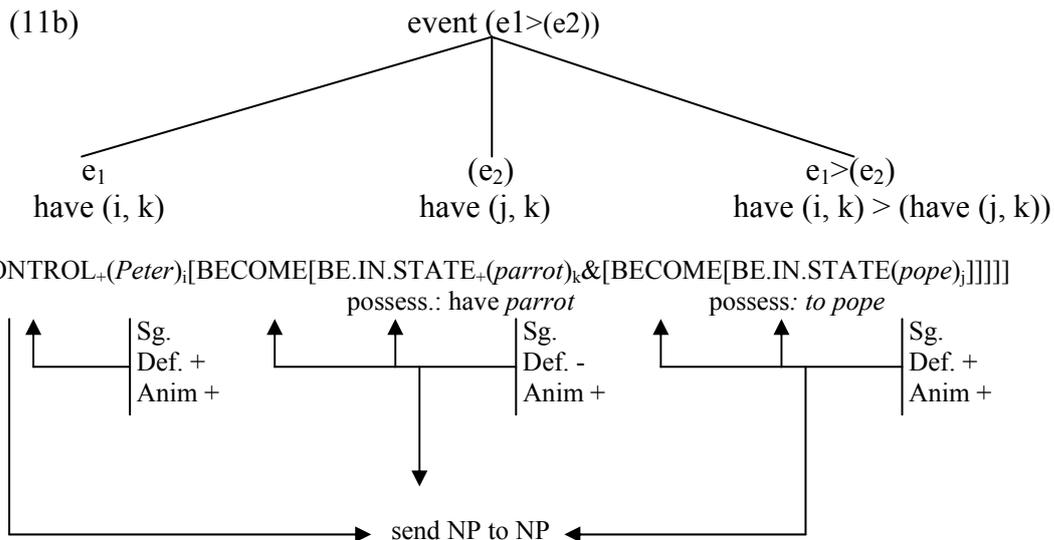
(9) *Peter gefällt dem Zahnarzt.*

(9') **Dem Zahnarzt wird von Peter gefallen.*

- *gefallen* (theme, experiencer) th < exp → no passive

The hypothesis about “responsibility as a grammatical category” says that someone who fears something can be made responsible for his fear. It is important to notice that this is no statement about whether the assignment is justified (true) or not. Important is the fact that the fearer is HELD responsible for what happens by the speaker, as is stated by the definition of CONTROL. It should also be clear, then, that there are no hard criteria to determine the status of some ontological units, whether they are (held) responsible (CONTROL₊) for something or “only” causing (CAUSE_{cos/csqn}) something. There may be inter- or intrapersonal, -cultural or -temporal differences in the assignment of the Conceptual Units with respect to a notion like responsibility. Finally, the feature volition is no more a criterion of what has been called agentivity. Either one causes something, then it is a causer or one is responsible for something, then it is a controller. There are no agents, at all.

Since primitive ontological units are conceptualized first, all the meanings of the locative alternation indicated by table 3.4 can be captured, depending on the feature [definiteness] of the primitive units and the question which of them will become the direct object. The former question is specified in the lexical entry below the primitive unit, the latter is indicated by the BE.IN.STATE-unit on *the wagon*, i.e. the presence or absence of [+].¹¹⁵



The difference between (11a) and (11b) lies in the conceptualization of *the pope* as argument of CONTROL₀ or BE.IN.STATE. There are no differences in the conceptualization of *the parrot*. In (11a) the event is successful, i.e. the pope actively receives the parrot, in (11b) this is not necessarily the case. The semantic difference results in the ADOC.

Before concluding, it shall be mentioned that the PMD and PMESI give rise to non-default linking, or idiosyncratic linking. Perhaps some overtly realized accusative could have been conceptualized as argument of CONTROL₀ or BE.IN.STATE₀, but the PMD forces it to be realized as accusative instead of dative.

The theses presented in this chapter are not well worked out, but only suggestions. There are a lot of problems with the representations given so far and much work remains to be done. Nevertheless, some ideas like the “conceptual composition of events” and “responsibility as a grammatical category” do not seem to be completely absurd. They will be subject to future research.

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- ¹ By syntactic structure the abstract syntactic representation included in a grammar is meant.
- ² By “syntactic construction” the actual syntactic structure, e.g. a particular sentence, is meant. The term “construction” is used here independently from Construction Grammar (see Goldberg 1995).
- ³ The terminology differs from theory to theory. In Chomskyan theories they are called “ θ -roles” (i.e. “theta-roles”), the Case Grammar notion is “case roles”. Also possible is “semantic role”. I will use the most common and most neutral term with respect to any theory: “thematic roles”.
- ⁴ Precursors of an idea of thematic roles can be traced back to at least 600 B.C (see ch. 2). I will concentrate on theories that have developed in connection with Chomsky (1957, 1965).
- ⁵ This construction is called locative alternation, even if the given phrase is not analysed as bearing the locative role. Unfortunately, there is no better term available.
- ⁶ ASP: Aspects-theories, P&P: Principles and Parameters theories, MIN: Minimalistic theories.
- ⁷ HPSG: Head-Driven Phrase Structure Grammar.
- ⁸ LFG: Lexical-Functional Grammar.
- ⁹ The originality and the influence of Jackendoff’s work deserve their own category, although his theory has been developed in connection with Chomsky’s theories.
- ¹⁰ LMT: Lexical Mapping Theory.
- ¹¹ OT: Optimality Theory.
- ¹² RRG: Role and Reference Grammar.
- ¹³ Although Primus is also a “successor” of Dowty, her theory is original and autonomous enough to deserve a special treatment.
- ¹⁴ LDG: Lexical Decomposition Grammar.
- ¹⁵ Namely, strong versions of the UAH* and UTAH* have assumed 1:1 correspondences.
- ¹⁶ See Böhrtlingk, O. 1839: *Pāṇini’s Grammar*. Delhi: Motilal Banarsidass. Republished in 1998. Most of the modern studies of Pāṇini are based on Böhrtlingk’s work.
- ¹⁷ In talking about Blake (1930) I will use his terminology with respect to morphological case (= case form) and „semantic“ case (= case)
- ¹⁸ Here the distinction between the direct affective accusative and the cognate or intensive accusative corresponds to what Fillmore (1968, 4) calls “affectum” and “effectum” and what has no direct corresponding notion in most modern thematic role theories.
- ¹⁹ The examples given in this table contain two arguments of which one is stationary and the other is moving relative to the stationary. In Talmy’s (2001, 2003) cognitively oriented theory the moving argument is assigned the role figure and the stationary argument is assigned ground.
- ²⁰ One could say that there are different kinds of sources: a causal and a spatial/locational. Here the term is restricted to the latter.
- ²¹ These notions should not be confused with the grammatical categories, resp. functions subject and predicate. The terms used here denote only the semantic notions as they are traditionally used in the classical Latin grammar.
- ²² In ancient syllogistic there was no way to handle the intuitively correct syllogism (see Tugendhat/Wolf (1983, 81ff.)):

- i) All circles are figures.
- ii) Peter draws a circle.
- iii) (It follows that) Peter draws a figure.

This is because ii) is analysed as [Peter [draws a circle]]. So there is no *terminus medius* necessary for a syllogism. For a solution the predicate must be subdivided.

- ²³ To my knowledge, the term “linking” has first been used and therefore been introduced to linguistic theory by Richard Carter (1988, orig. 1977).
- ²⁴ It should be noticed that it is not unusual that some roles differ in their name but share similar definitions. This is due to the different theories in which the thematic roles are embedded. For example the Case Grammar dative corresponds to the column of the benefactive and recipient roles.
- ²⁵ This role can be characterized as causing a sensual perception or mental state in a human participant.
- ²⁶ This role can be characterized as one of natural forces like “wind” which share some properties with agents but which are not animate and do not act wilfully.
- ²⁷ Reinhart (2000, 3) states:

“The general picture I assume is that the Theta system (what has been labelled in Chomsky’s Principles and Parameters[*] framework ‘Theta theory’) belongs to the systems of concepts: It can be viewed as the central system of the systems of concepts – the system whose outputs (or some of them) are legible to the computational system (CS).”

²⁸ E.g. Chomsky's (1970) *Remarks on Nominalization*. The correct term is actually "predicate-argument structure".

²⁹ More precisely, Marantz (1984) links thematic roles to grammatical functions and to structural positions. In the logico-semantic structure thematic relations are determined which then are linked to grammatical functions in the so-called s structure via a general principle. From s structure the linking goes on to the structural positions in surface structure (Marantz (1984, 7)).

³⁰ Possibilities to establish the origins of feature decomposition are Anderson, S. R. 1971: On the role of deep structure in semantic interpretation. *FL* 7. 387-396. Anderson (1977). Rozwadowska, B. 1988: Thematic restrictions on derived nominals. In: *Wilkins* (1988). This work confines itself to discussing Wunderlich (2000 and subsequent) & Kiparsky (1997), Reinhart(2000) and Kibort (2007) because they are considered to be more substantive with respect to the linking problem.

Although macroroles were invented very early Dowty's proto-role proposal is mentioned here, too. In early RRG* macroroles existed besides discrete and hierarchical roles.

³¹ How is this done? Arad (1996, 6) states:

"Assume now that arguments are generated in specifiers of aspectual projections, where they are assigned aspectual interpretation: the first of which is AspEM (for event measurer), where accusative Case is assigned. When this node is specified as [+EM], the argument that is generated at its spec is interpreted as the *measurer* of the event described by the verb, and the predicate is given a telic interpretation (the existence of a measurer entails a telic interpretation, because, as I showed above, a measured event terminates once the change that the measurer undergoes has taken place). The second node is AspOR (for originator). The argument that is generated at spec, AspOR is interpreted as the originator of the event, and the event therefore has a point of beginning in time. An "Agent", in my model, is just a convenient label for the argument which is at spec, AspOR (an originator of an event).

³² More precisely, this is valid independently from the thematic tier. With respect to actions, agent is the highest and patient the lowest role.

³³ For example, inanimate arguments cannot be agents or experiencers.

³⁴ To be precise, the case frame of an unergative contains an A, that of an unaccusative contains an O. See ch. 4.1.2 for details.

³⁵ This may be valid for the universality of his proposal, but the dependence on agentivity and aspect has been pointed out by Zaenen (1988) before.

³⁶ This definition is built on pioneer work of Perlmutter/Postal (1983): *Toward a Universal Characterization of Passivization*. In: *Studies in Relational Grammar 1*. Ed. David M. Perlmutter. Chicago: The University of Chicago Press. 3–29.

³⁷ This is only valid apart from information structural considerations. Generally, it seems improbable that there is real synonymy, at all.

³⁸ In nearly all thematic hierarchies the ranking of location is identical to those of source and goal. There are probably three hierarchies in which source/goal/location do not have the same ranking: Kiparsky (1985): *Morphology and Grammatical Relations*. Unpublished Ms. Stanford. He ranks

agent > source > goal > instrument > theme/patient > location.

Larson (1988, 382) ranks

agent > theme > goal > obliques (location etc.).

Nishigauchi (1984, 221) ranks

goal > location/source

for control constructions in which goal co-occurs with one of the others. Another notion of "source" can be found in Clark/Carpenter (1988) who point out the significance of the role source in language acquisition. Obviously, two- and three-year-old children overgeneralize from agents to sources, i.e. they treat agents as sources. In this sense, they are also higher-ranked than goals and locations. This is due to a causal interpretation of sources (indicated by the use of *from* instead of *by* in passives) which indicates in some way the validity of locational decomposition (see also DeLancey (2000) and Foley/van Valin (1984) for similar arguments with respect to source, goal, location).

³⁹ In RG this is explained by the “Final 1 Law”: “Every basic clause must have a 1-arc in the final stratum.” (See Butt (2005, 35). In other words, all sentences must have subjects.

⁴⁰ On proto-roles see ch. 4.3.2.

⁴¹ For now, stimulus is the role of the entity or state of affairs that causes an emotion or perception in a human participant. See ch. 3.5 for further discussion.

⁴² Both are not precise, so that the slightly clumsy formulation is preferred. “Dative shift” comes from GB and implies movement and both terms include datives, which are not present at all in English, at least.

⁴³ The first who recognized that a transformational account to the locative alternation was insufficient because of their different meanings was Anderson, S. R. 1971: On the role of deep structure in semantic interpretation. *FL* 7, 387-396.

⁴⁴ See note 43.

⁴⁵ See ch. 4.1.2 for the introduction of Deep Cases. Fillmore (1968, 30) assigns D and O to both verbs, although the definition of O does not seem to fit the semantics of these verbs, anyway (see Fillmore (1968, 25). Anderson (1977, 25) has also pointed a problem with respect to Fillmore’s subject selection rule. If both verbs are analyzed as taking identical deep cases (O + I in Anderson (1977)) then in any case the subject selection rule is violated. It is rather surprising that Fillmore obviously has not paid any attention to this fact.

⁴⁶ Croft, W. 1986: Surface Subject Choice of Mental Verbs. Paper presented at the 61st annual meeting of the Linguistic Society of America. New York. Citation in Ackerman/Moore (2001).

⁴⁷ Note, that the judgements in these sentences follow the intuition of the author and may deviate from those of other speakers. The judgements of English sentences follow mainly those found in the literature.

⁴⁸ See chapter 5 for this discussion.

⁴⁹ The verbs listed here are only suggestions. Naturally, they are not synonymous with the psych-verbs of the corresponding classes. But they possibly show the same features with respect to the parameters listed in the columns in this figure.

⁵⁰ With an inanimate subject.

⁵¹ The architecture of Gruber’s theory is a modification of early Transformational Grammar. The special about this modification is the fact that Gruber posits a structure that is deeper than Deep Structure and which is semantic in kind. (Cf. Gruber (1965, 1-5)). In this prelexical structure events are semantically specified in terms of a prelexical string which determines the syntactic-semantic environment of the verb/predicate. There is a system of prelexical structure rules which build tree-like prelexical structures which may undergo transformations in order to fit the requirements of syntactic deep structure. From the point of Deep Structure on the theory is that of Chomsky (1965).

⁵² Cf. Butt (2005, 53f.).

⁵³ In addition, his theory is a certain deviation from the P&P framework in proposing additional architectural representations and reintroducing older notions. Cf. note 4.

⁵⁴ Marantz reintroduces grammatical relations into the theory.

⁵⁵ “A predicate is any non-propositional major category X^{\max} , immediately dominated by V^n , which a) bears no grammatical relation to the verb, or b) is an infinitival VP.” (CW (1986, 121)).

⁵⁶ Based on Anderson (e.g. 1971).

⁵⁷ Unfortunately, CW define “predicate” which crucially involves the notion of VP, and then modify the VP so that it remains unclear, whether V^1 or V^2 is meant when talking about predicates. From the figures shown in the figures in the paper one could infer that V^2 is meant. This will be assumed here.

⁵⁸ It is not clear which precise status this rules have, because it is not clearly explicated what the relationship between Anderson’s (1977) rules and CW’s theory is.

“(i) a. Assign lexically idiosyncratic roles, or

b. Assign A to the object if there is one. Otherwise, assign A to the subject (antecedent). Assign E to the subject (antecedent) if nothing has been assigned to it.

(ii) Realize A as theme.

(iii) Realize A as patient and E as agent, or A as patient and E as instrument, or E as goal, or ..., depending on the governing verb or preposition.” (CW (1986, 124)).

⁵⁹ In the following coindexing rules $R(NP)$ denotes the r-structure of a NP, $R(X)$ that of any constituent X.

“Coindex $R(NP)$ and $R(X)$ where X is a predicate.

a. Thematic conditions on r-structure:

(i) If $R(X)$ bears no thematic role, then $R(NP)$ must be a theme or a source.

(ii) If $R(X)$ is a goal, then $R(NP)$ must be a theme.

(iii) If $R(X)$ is a theme, then $R(NP)$ must be a source.

b. Locality conditions:

(i) If $R(NP)$ and $R(X)$ both bear thematic roles, they must do so within the same domain (i.e. with respect to the same role-assigning element) at r-structure.

-
- (ii) If R(NP) or R(X) bears no thematic role, then X must be bijacent to NP in syntactic structure.
- c. Definition: X is bijacent to NP iff:
- (i) X is a sister to NP, or
- (ii) X is immediately dominated by a sister of NP.” (CW (1986, 125f.)).

⁶⁰ “Agentive (A): the case of the typically animate perceived instigator of the action identified by the verb.
Instrumental (I): the case of the inanimate force or object causally involved in the action or state identified by the verb.

Dative (D): the case of the animate being affected by the state or action identified by the verb.

Factitive (F): the case of the object or being resulting from the action or state identified by the verb, or understood as a part of the meaning of the verb.

Locative (L): the case which identifies the location or spatial orientation of the state or action identified by the verb.

Objective (O): the semantically most neutral case, the case of anything representable by a noun whose role in the action or state identified by the verb is identified by the semantic interpretation of the verb itself; conceivably the concept should not be limited to things which are affected by the action or state identified by the verb. The term is not to be confused with the notion of direct object, nor with the name of the surface case synonymous with accusative.” (Fillmore (1968, 24f.)). The list is open-ended.

⁶¹ The corresponding prepositions are: A – *by*; I – *by* (if no A present), otherwise *with*; O, F – zero; B – *for*; D – *to*; L, T(ime) – that which is required. (Fillmore (1968, 32)).

⁶² It is not clear, which deep cases there are, that are possible candidates for being the argument of an unaccusative verb. Probably, A and I are candidates for unergatives, while O/D/F are certainly unaccusative arguments.

⁶³ Note, that RG’s initial grammatical relations are not identical to the traditional grammatical functions*. Therefore, van Valin’s (2005) criticism of the universality of the latter does not affect them.

⁶⁴ There are four criteria for this structure (Croft (1991, 165ff.)): 1. “An atomic event must be of only one causation type.“ Possible types are i) a physical object acting on a physical object, ii) a volitional entity acting on a physical object, iii) a physical object acting on an entity with mental states, iv) a volitional entity acting on an entity with mental states. Psych-verbs are included in iii). 2. Aspectual types are “state” and “process”. 3. Transmission of force, which includes the acting of an individual on another, the beginning and the end of such chains, the direction of force, degree of involvement, deciding between direct object and obliques. 4. Qualitative semantic differences must also be captured.

⁶⁵ Comitative: “An entity that participates in a causal chain at the same point and in the same role as the subject of the main verb. It is likely that the comitative role also requires that the subject be the initiator of an act of volitional causation [...]”

Instrument: “An entity that is intermediate in a causal chain between the subject (initiator) and the direct object (final affected entity).”

Manner: “A property holding of some or all of the verbal causal segment.” Can be expressed by adverbs or PPs.
Means: “A proper subsegment of the main verb causal segment that shares the same initiator as the main verb.”
The means clause must be volitional.

Benefactive: “The endpoint of an action that causally follows the verbal causal segment. The participant is normally a mental-level entity ontologically. [...] I also include the recipient as a benefactive-type oblique thematic role [...]”

Cause: “An event [...] that causally immediately precedes the event sequence denoted by the main verb.”

Passive agent: “An entity that precedes the subject in the causal chain, when the main verb describes the event that results in the subject’s present state.”

Result: “An event [...] that causally immediately follows the event sequence denoted by the main verb.”

Purpose: “An event that is intended by an agentive initiator of the main verb causal segment to follow causally from the event denoted by the main causal segment.”

⁶⁶ Agent: “the initiator of an act of volitional causation.”

Patient: “the endpoint of an act of volitional causation.”

Experiencer: “the endpoint of an act of affective causation.”

Stimulus: “the initiator of an act of affective causation.”

⁶⁷ Note that this is a purely theoretic notion and not a moral judgment. The latter can unfortunately be found in many papers coming from a Chomskyan tradition which claim „explanatory adequacy“ for their work.

⁶⁸ Although Fillmore’s subject selection rule does not work, as the discussion in ch. 4.1.2 shows, his generalization seems to be right.

⁶⁹ The THC served also to restrict the relationship between a reflexive pronoun and its antecedent in a sentence.

⁷⁰ According to Talmy (2001) figure represents the entity moving or conceptualized with reference to another entity, ground. This makes an analysis of perspective-dependent sentences like *The office is behind the bank* or

The bank is in front of the office possible (cf. Dowty (1991)). The first argument is figure with respect to the other argument. It is also a remarkable fact that the figure-entity should be smaller than the ground entity. The violation of this constraint like in the first example makes the sentence slightly odd. Anyway, DeLancey (2000) identifies the theme with figure and the location with ground. Applied to (50) this means that the given analysis is right.

⁷¹ An agent is thus the first argument of CAUSE, theme is the first argument of CHANGE, source is the second (i.e. an initial state), goal the third (i.e. a final state). Theme is also the first argument of BE, while location is the second (cf. Jackendoff (1972, 39)).

⁷² Jackendoff's (1987, 375) conceptual categories:

- a. PLACE → [_{PLACE} PLACE-FUNCTION (THING)]
- b. PATH → [_{PATH} {TO/FROM/TOWARD/AWAY-FROM/VIA}({THING/PLACE})]
- c. EVENT → {[_{EVENT} GO (THING, PATH)]/[_{EVENT} STAY (THING, PLACE)]}
- d. STATE → {[_{STATE} BE (THING, PLACE)]/[_{STATE} ORIENT (THING, PATH)]}

The following can be added:

- e. EVENT → [_{EVENT} CAUSE (AGENT, EFFECT)]

⁷³ Jackendoff (1987, 396) has also suggested to analyse experiencers as follows

- f. EXP (X, Y)

⁷⁴ This is also expressed in terms of conceptual structure, worked out in Jackendoff (1990, ch. 7):

- f. AFF ([X], [Y]), where the second argument of AFF⁻ is patient, the second argument of AFF⁺ is beneficiary

⁷⁵ Jackendoff's (1987, 384) argument substitution:

„For each indexed position in the reading of the verb or preposition, substitute the reading of the syntactic constituent in the sentence that satisfies the coindexed position in the verb's subcategorization feature, if its conceptual category matches that of the indexed position. For the position indexed *i* in the reading of the verb, substitute the reading of the subject, if its conceptual category matches that of the position indexed *i*.”

Jackendoff's (1987, 386) argument fusion:

“Into each indexed constituent in the reading of the verb or preposition, fuse the reading of the syntactic constituent in the sentence that satisfies the coindexed position in the verb's subcategorization feature. Into the position indexed *i* in the reading of the verb, fuse the reading of the subject.”

⁷⁶ In *x buys z from y* *x* is agent of buying, goal of *z*, source of money, *y* is source of *z*, goal of money and so on.

⁷⁷ The “+“ on CAUSE indicates a successful event *send*.

⁷⁸ This follows two principles (Goldberg (1995, 50)):

1. The Semantic Coherence Principle: Only roles which are semantically compatible can be fused. Two roles *r1* and *r2* are semantically compatible if either *r1* can be construed as an instance of *r2*, or *r2* can be construed as an instance of *r1*. [...] Whether a role can be construed as an instance of another role is determined by general categorization principles.

2. The Correspondence Principle: Each participant role that is lexically profiled and expressed must be fused with a profiled argument role of the construction. If a verb has three profiled participant roles, then one of them may be fused with a nonprofiled argument role of a construction.

⁷⁹ Cf. also Zaenen (1988), Alsina (1999); for a LMT-OT* account cf. Butt/Dalrymple/Frank (1997). For the role of LMT in LFG cf. Bresnan (2001); for a revised LMT cf. Kibort (2007).

⁸⁰ This is the θ -criterion of LMT (cf. ch. 4.1.1).

⁸¹ IC – Intrinsic Classification

⁸² In BK (1992, 112ff.) they give an account for language specific differences with respect to the passivizability of theme-location constructions, which is not satisfactory but better than Jackendoff's account who principally disallows theme-location constructions to passivized. The idea is to parametricize the Intrinsic Classification.

⁸³ Since psychological verbs will be presented within an analysis of Belletti/Rizzi (1988), Grimshaw's solution shall be indicated here: According to table 3.5 in chapter 3 there are two versions of *frighten*. The nominative argument of the non-agentive version is analysed as the aspectually most prominent one, thus bearing the cause role. But it is not thematically most prominent, since it is a theme, while the accusative argument is an experiencer. There is thus a prominence mismatch, which results in the lack of an external argument with this *frighten*. It is thus predicted to fail to undergo passivization. This is plausible, but in fact a matter of intuition, as well. The other *frighten* is agentive and therefore with an argument that is most prominent in both hierarchies. It behaves like any other causative change-of-state verb and can be passivized perfectly. A severe problem is there with the fear-class of psychological verbs. Since it undergoes passivization, it is predicted to have an external argument. This means, that the nominative argument of fear, i.e. the experiencer, must be associated with the first sub-event of the matrix-event. This is implausible since it is clearly the thing feared that causes the experience and not the other way around. This analysis is not well motivated, then.

⁸⁴ Goal/source/location taken as one.

⁸⁵ German psychological verbs seem to fit the analysis of Belletti/Rizzi quite well. So the discussion concentrates mainly on German examples.

⁸⁶ Aissen (1999) makes use of different functional constraints (e.g. grammatical functions*, person, and discourse prominence) interacting with a constraint agent >> patient, denoting proto-properties. She is severely criticized by Newmeyer (2002) for her conception of OT since she implicitly rejects some basic assumptions of the theory like the claim of universality of the constraints and the mental significance of the OT device.

⁸⁷ Van Valin has invented his macroroles in 1977. Until the 1990s thematic role types and generalized thematic roles were used together. Around 1997 the former were dismissed from the theory and only GSRs were used from this point on.

⁸⁸ The privileged syntactic argument (PSA) is the RRG notion for subject, external argument, 1 (in Relational Grammar*) but there is only a rough correspondence. The PSA is considered to sufficiently capture cross-linguistic generalizations.

⁸⁹ The „Default Macrorole Assignment Principle“ (van Valin (2005, 63)) is the following:

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

⁹⁰ Van Valin (2005, 116) gives the following characterization of “basic voice constructions” (slightly adapted): “PSA modulation voice: a. permits an argument other than the default argument in terms of the PSA hierarchy to function as the privileged syntactic argument. b. Argument modulation voice: gives non-canonical realization to a macrorole argument.

⁹¹ Note that this notion of “construction” is closely related to that of Construction Grammar*, namely a pairing of form and meaning information.

⁹² For the case and preposition assignment rules for English cf. van Valin (2007, 41f.).

⁹³ With *gefallen* the semantic valence (=2) differs from M-transitivity (van Valin (2005, 64ff.). Thus the number of macroroles is determined in the lexical entry of the verb. Its case pattern follows from case-assignment principles (i.e. dative for the non-macrorole direct core-argument) (van Valin (2005, 108, 110)).

⁹⁴ “Agent: The prototypical transitive clause involves a volitional, controlling, actively-initiating agent who is responsible for the event, thus is its salient cause.” (Kibrik (1997, 288)).

⁹⁵ “Patient: The prototypical transitive clause involves a non-volitional, inactive non-controlling patient who registers the event’s change-of-state, thus is its salient effect.” (Kibrik (1997, 288)).

⁹⁶ “Absolutive: The immediate, nearest most involved or affected participant of the situation.” (Kibrik (1997, 292)).

⁹⁷ “Sole: The sole core participant of an event.” (Kibrik (1997, 289)).

⁹⁸ The entailments for the proto-agent are the following

- “a. volitional involvement in the event or state
- b. sentience (and/or perception)
- c. causing an event or change of state in another participant
- d. movement (relative to the position of another participant)
- (e. exists independently of the event named by the verb)”

The entailments for the proto-patient are (Dowty (1991, 572)):

- “a. undergoes change of state
- b. incremental theme
- c. causally affected by another participant
- d. stationary relative to movement of another participant
- (e. does not exist independently of the event, or not at all)”

⁹⁹ “Argument Selection Principle” (Dowty (1991, 576)):

„In predicates with grammatical subject and object, the argument for which the predicated 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.

Corollary 1:

If two arguments of a relation have (approximately) equal numbers of entailed proto-agent and proto-patient properties, then either or both may be lexicalized as the subject (and similarly for objects).

Corollary 2:

With a three-place predicate, the nonsubject argument having the greater number of entailed proto-patient properties will be lexicalized as the direct object and the nonsubject argument having the fewer entailed proto-patient properties will be lexicalized as an oblique or prepositional object (and if two non-subject arguments have approximately equal numbers of entailed P-patient properties, either or both may be lexicalized as direct object).

Nondiscreteness:

Proto-roles, obviously, 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).”

¹⁰⁰ “Bounding Entity:

An argument a_i of predicate P is a bounding entity iff P is a telic predicate and entails that a subpart of the denotation of the entity that corresponds to a_i (under any use of P), expresses the end-point of any telic event denoted by P and its arguments.” (AM (2001, 97)).

“Telic Predicate:

A lexical predicate P is telic iff for every event e and e' , such that $P(a_1, \dots, a_n, e)$ and $P(a_1, \dots, a_n, e')$, and where e' is a subevent of e , e and e' have the same boundaries (end-points).” (AM (2001, 97)).

¹⁰¹ “Extended Paradigmatic Argument Selection Principle:

Let $P(\dots, \text{arg}_i, \dots)$ and $P'(\dots, \text{arg}'_i, \dots)$ be related predicates, or members of related predicate classes, where arg_i and arg'_i are corresponding arguments. If arg_i and arg'_i exhibit different grammatical encodings and arg_i is more prototypical with respect to a particular proto-role than arg'_i , then arg_i 's encoding will be less oblique than arg'_i 's encoding.” (AM (2001, 172)). The corresponding obliqueness hierarchy is the following (cf. AM (2001, 92), adapted for German): $\text{nom} > \text{acc} > \text{dat} > \text{other}$.

¹⁰² “If P is an n -place predicate, then P 's lexical entry contains an ordered list of valence slots, $\langle x_1, \dots, x_n \rangle$, where each slot bears a unique index i , $1 \leq i \leq n$. A subset of P 's entailments will be partitioned into n sets, each associated with a different valence slot. An entailment set associated with an indexed valence slot x_i is an argument (arg_i) of P .” (AM (2001, 44)).

¹⁰³ “Thematic Case Selection Principle:

For any language L , for any participants that are syntactic arguments and for the highest ranking cases (i.e. morphological coding categories) A and B in L :

a. The greater the number of Proto-Agent basic relations a participant accumulates, the more likely it is coded by A .

b. The greater the number of Proto-Patient basic relations a participant accumulates, the more likely it is coded by B .” (Primus (2002, 10)). The corresponding, necessary case hierarchy is: nominative $>$ accusative $>$ dative $>$ other oblique cases

¹⁰⁴ “Structural expression of dependency:

If a non-head constituent Y depends on a non-head constituent X , then X precedes and/or c-commands Y . (X c-commands Y if and only if X and Y do not dominate each other, and the first branching node that dominates X dominates Y .)” (Primus (2006, 69)).

¹⁰⁵ x, y, z are argument variables, s is the variable for the situation denoted by the verbal predicate, $s[y]$ denotes an argument included in s , $pred$ is the variable for any basic thematic predicate, e.g. *ctrl*, *exp*.

¹⁰⁶ „Every verbal predicate with a fully realized argument structure has an obligatory or facultative nominative syntactic argument.” (Primus (1999, 65)).

¹⁰⁷ Angled brackets indicate redundancies according to (90) a.-d.

¹⁰⁸ „The Principle of Morphosyntactic Expression of Thematic Information:

For any language L , for any participants that are syntactic arguments, and for any distinct morphosyntactic coding categories A , B , and C such that A and B are the highest ranking coding categories in L :

a. The greater the number of P-A basic relations a participant accumulates in the unmarked reading of the predicate (or sentence), the more likely it is coded by A .

b. The greater the number of P-P basic relations a participant accumulates in the unmarked reading of the predicate (or sentence), the more likely it is coded by B .” (Primus (1999, 230, slightly adapted)).

¹⁰⁹ „The Subcategorization Principle:

Ideally, the assignment of a lower ranking formal category (e.g. case) by a predicate P implies asymmetrically the assignment of a higher ranking formal category by P ; the higher rank of a formal category is, the less restricted the class of predicates that assign it.” (Primus (1999, e.g. 227)).

¹¹⁰ For another lexical decomposition theory cf. Reinhart (2000). Reinhart (2000, 25) makes use of only two features, $[c]$ and $[m]$ for “cause change” and “mental state involved” which allows eight feature combinations when they are used alone and in combination.

¹¹¹ Roughly, the principle of „possible verbs“ guarantees, that every lower predicate in the decomposed structure is more specific than the higher. “Connection” ensures that every predicate shares an argument with another predicate. “Coherence” states, that “subevents encoded by the predicates of a decomposed SF structure must be connected contemporaneously or causally”. (Wunderlich (2000, 251)).

¹¹² Furthermore, the mapping is constraint by two principles:

“Argument hierarchy” says that the “list of λ -abstractors in TS corresponds to the depth of embedding in SF, with the lowest argument to the left [...], and the highest argument to the right. Correspondingly, the lowest argument (of a polyadic verb) is designated as $[+hr, -lr]$, and the highest argument as $[-hr, +lr]$, whereas all medial arguments are designated as $[+hr, +lr]$.”

Structural arguments: An argument is structural only if it is either the lowest argument or (each of its occurrences) L(exically)-commands the lowest argument; so every internal (non-highest) argument of a nonfinal predicate in SF is nonstructural [...]. L-command is defined for the nodes in SF, which represent logical types, as follows: α L-commands β if the node γ , which either directly dominates α or dominates α via a chain of nodes type-identical with γ , also dominates β ." (Wunderlich (2000, 252)).

¹¹³ The index indicates that an oblique argument, i.e. a prepositional phrase cannot be associated with maximal affection, i.e. with BE.IN.STATE₊.

¹¹⁴ If the argument of CONTROL₊ is the only argument conceptualized, it is x ; if the argument of BE.IN.STATE₊ is one of three arguments that are conceptualized, it is z , and so on.

¹¹⁵ It is rather doubtful to assume definiteness to be a lexical and not an information structural feature. It is not plausible why the man should have a lexical entry and a man should have another. Because of the lack of a better solution it will be treated as a lexical feature, as it is done by most of the linking theories, e.g. LFG.

Glossary

The following glossary cannot supply complete definitions of the particular entries contained in it. It concentrates on sketching the most important aspects of them and the role thematic relations play with respect to them.

ADOC:

→Double object construction

Aktionsarten:

Notion based on Vendler's (1967b) classification of the temporal structure of verbal semantics. According to this verbs (in combination with subcategorized verbs) express either states (static, non-action, atelic, durative), activities (non-static, action, atelic, durative), accomplishments (non-static, non-action, telic, durative), achievements, (non-static, non-action, telic, punctual). Van Valin (2005) has added active accomplishments (non-static, action, telic, durational), semelfactives (non-static, atelic, punctual), and a causative counterpart of each.

Argument structure:

Part of the lexical entry of a verb intended to capture generalizations about the correspondence of its meaning and its syntactic behaviour in terms of thematic roles (or some related notion). Part of the verb's lexical-semantic features can thus serve to predict its syntactic behaviour with respect to its subcategorized arguments. According to a principle of lexical economy some predicating elements share the same lexical entry, e.g. the verb *destroy* and the noun *destruction*, where obvious differences (e.g. the status of the agent) are accounted for by lexical (redundancy) rules.

Aspects theory:

Major step in the development of the Chomskyan theories based on Chomsky's (1965) *Aspects of the Theory of Syntax*, in which semantic roles did not yet play any role. What is important is the fact that semantic interpretation applied solely to deep structure which was modified by Jackendoff's (1972). The slightly simplified Aspects architecture:

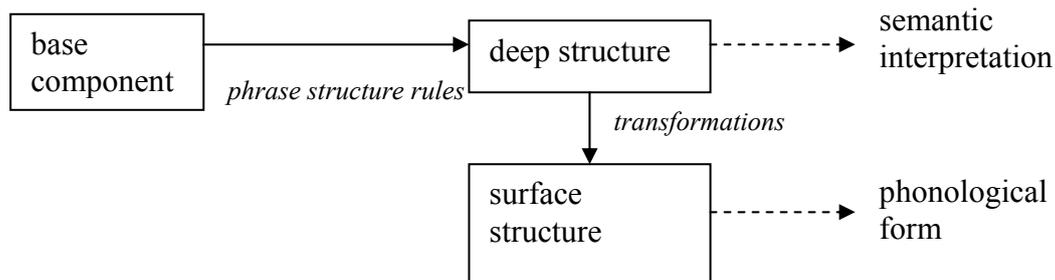


Figure 6.1: *Architecture of the Aspects theory*

Case form (as opposed to “case”):

Terminological distinction first introduced by F. Blake (1930) in order to distinguish the notion “case” in semantic and formal respects; was then picked up by Fillmore (1968) for his →Case Grammar. For the formal notion of case the term “case form” was introduced, while “case” referred to the semantic relationship.

Case Grammar:

Established by Fillmore (1968). Modification of the phrase structure grammar of the →Aspects type based on some central assumptions about the role of case in a theory of grammar. A presumably universal set of →deep cases that are semantic in nature was introduced into deep structure in order to constrain the linking to language-specific surface structures. The linking takes place via “case frames” which provide environments for cases in a sentence and “frame features” of verbs in which verbs are associated with particular configurations of deep cases in their lexical entry.

Cognitive Grammar:

Established by Langacker since the second half of the 1970s. Makes extensive use of ideas of the gestalt psychology. The main idea is that the human cognition is structured according to the (mainly visual) perception of spatial relationships and that these relationships are reflected by linguistic structures. For Cognitive Grammar languages consist of phonological and semantic units which are symbolic units when combined.

Construction Grammar:

Grown out of →Cognitive Grammar and based on ideas of Lakoff and Fillmore (throughout the 1970s), worked out by Goldberg (1995). CG views languages as consisting of constructions. Constructions are pairings of meaning-form units and they

are treated as primitive (and cognitively represented) instead of being further analyzed. CG assumes that speakers make use of such meaning-form patterns when making an utterance (\rightarrow Cognitive Grammar). Constructions are considered to capture e.g. generalizations of the correspondence between thematic roles and grammatical functions. It is therefore related to \rightarrow Case Grammar. Other properties: monostratal, generative.

Deep case:

Term taken from \rightarrow Case Grammar. It denotes the syntactic-semantic relationships in a modified deep structure among verbs and their arguments. They are therefore closely related to \rightarrow thematic roles. Deep cases are agentive, instrumental, dative, factitive among others.

Discrete thematic roles:

Sort of thematic role theories in which there is a particular list of \rightarrow thematic roles and where the roles are not related to each other in terms of some hierarchy, prominence, or specificity. Particularly, the early thematic role theories were discrete role theories. According to Dowty (1989, 1991), DTRs can be further subdivided into individual thematic roles and discrete thematic role types (i.e. abstractions of the former). DTRs were followed by thematic role \rightarrow hierarchies and \rightarrow generalized thematic roles.

Double object construction:

Syntactic construction with two (non-prepositional) objects that in some cases may alternate with a construction in which the prior adjacent argument of the verb appears as a prepositional phrase ($NP_1-V-NP_2-NP_3 \leftrightarrow NP_1-V-NP_3-P-NP_2$). Subject to constant controversies is the question whether both constructions mean the same or not and whether both constructions are basal or one is derived from the other. It is also not clear whether both constructions are associated with the same or different \rightarrow thematic roles.

Feature Decomposition:

Presumed solution to the problem of the grain-size of thematic roles. According to FD theories, \rightarrow thematic roles are not assumed to be \rightarrow primitive notions but can be decomposed in terms of few semantic features, which then serve the same function as

thematic roles: capture and constrain the regularities with respect to the relationship between predicates and arguments in semantics and syntax.

Functional Grammar:

Theory of grammar established by Dik at the end of the 1970s. It views language as social and psychological phenomenon and tries to explicate and model the communicative competence of a language user. FG rejects the thesis of the autonomy of grammar and regards semantics and syntax as central without formulating clear boundaries between the latter. Also claims psychological adequacy and typological adequacy.

Generalized thematic role theories:

In contrast to what the term suggests no homogenous sort of \rightarrow thematic role theories but rather a concept that is characterized by the attempt to eliminate the disadvantages of \rightarrow discrete role theories and \rightarrow hierarchies of thematic roles by assuming only two (or three or even more) roles that generalize in some way about \rightarrow discrete roles.

Grammatical function:

Heterogeneous notion, which – in traditional Latin grammars – refers to parts of a sentence with respect to their function relative to the whole: a “subject” can be defined as the entity about which something is predicated, the “predicate” is what is said about the subject, and the “object” is, as part of the predicate, affected or effected. In several recently developed theories of grammar GFs are rejected because of their lack of universality (\rightarrow RRG), redundancy (\rightarrow P&P), or lack of semantic significance (\rightarrow RRG). Others crucially involve them (\rightarrow LFG, \rightarrow RG).

Head-Driven Phrase Structure Grammar:

Theory of grammar established by Pollard/Sag in the early 1980s. HPSG is built on assumptions about the organization of an abstract, mental, (generative) lexicon. All grammatical information is organized in terms of (possibly recursive) attribute-value matrices. Linguistic information is passed on by lexical heads along a hierarchy of types constituted by classes of linguistic objects (words (noun, adjective etc.), phrases etc.). According to this “percolation” the head of a phrase bears features of the whole phrase. HPSG allows for implementation of individual thematic roles, discrete thematic role

types (→discrete thematic roles), →hierarchies of thematic roles, and →generalized thematic roles.

Hierarchy of thematic roles:

Notion involved in the semantics-syntax linking, based on the assumption that the mapping of arguments respects prominence relations, i.e. the prominence relations among thematic roles are mirrored in the (in multistratal theories underlying) syntactic structure. The assumption of a thematic hierarchy (TH) is based on some kind of a relativized UTAH*. The first TH was formulated by Jackendoff (1972) in order to restrict the application of operations like passivization and reflexivization. Although the TH successfully cleared up several problems stated by →discrete role theories, there is no agreement as to the roles included in it and to their ranking.

***Kāra*ka theory:**

Presumably the earliest theory of the interaction between the semantics of verbs and the morphological case in which their arguments appear in syntax. The regularities of these interactions were formulated by Pānini for ancient Sanskrit (600 BC) in terms of *Kāra*ka roles which can be regarded as precursors of modern →thematic roles. They are semantically defined and related to i) verb classes and ii) morphological cases 1-7 by rules.

Lexical Decomposition:

Based on the assumption that thematic roles are not →primitive notions, LD approaches analyse verbal semantics in terms of logical predicates like CAUSE, BECOME, BE etc. instead of associating them with →thematic role labels. Rather, subcategorized arguments of verbs take positions in those decomposed structures, which then serve to determine their syntactic position. Although it is questionable whether DC can capture the meanings of natural predicates adequately, it seems to be a theoretically more adequate solution than the treatment of thematic roles as primitives. In addition, conceptions of LD often claim to capture only the linguistically relevant aspects of meaning.

Lexical Decomposition Grammar:

LDG is a theory of argument linking mainly developed by Wunderlich during the 1990s. It consists of (a) a conceptual structure which contains thematic information about predicates. Grammatically relevant aspects of CS are present in (b) semantic form in terms of \rightarrow lexically decomposed structures. (c) Theta structure is derived from SF in terms of “abstract case features” [+/- higher role] and [+/- lower role] combined with lambda-abstractors. Together they are considered to account for argument alternations, case-marking and verb agreement which is expressed in (d) morphology/syntax.

Lexical(-)Functional Grammar:

Generative grammar established by Bresnan and Kaplan at the end of the 1970s as a differentiation from Chomsky-style generative grammar. LFG is a monostratal theory and explains those phenomena that are explained in terms of transformations in Chomsky’s grammar in terms of operations in/on the lexicon. There are at least two structures assumed, a universal functional structure which is connected with language-specific constituent structures via functional descriptions. Additionally, there is an information structure and \rightarrow Lexical Mapping Theory supplies the argument-structure for the theory. In early LFG, lexical entries were associated with arguments of a verb in its lexical entry.

Lexical Mapping Theory:

Mainly established by Bresnan, Kanerva and Zaenen at the end of the 1980s, LMT is part and further development of \rightarrow Lexical-Functional Grammar. Early LFG long has lacked a well-articulated theory of argument-structure which was supplied with LMT. It serves to restrict the linking between thematic roles and grammatical functions based on the features +/- restricted and +/- objective. An “Intrinsic Classification” further restricts the possible correspondences. The outputs are subject to wellformedness-conditions, which roughly state that every sentence must have a subject and that every thematic role must be associated with a grammatical function and reverse.

Minimalism:

Further development of P&P begun by Chomsky at the beginning of the 1990s. It aims at minimizing the syntactic component as interface between a phonological component and a logical form. The grammar is reduced to these two levels which are connected

with the perception and conceptual-intentional system and the articulatory-perceptual system. There is no distinction between d- and s-structure. Well-formed expressions are expressed in terms of $\langle \pi, \lambda \rangle$ -pairs and subject to complete interpretation. Lexical items are subject to operations like merge and movement. The latter serves for the feature-checking of lexical items.

Multi-dimensional accounts to thematic roles:

Multi-dimensional accounts to \rightarrow thematic roles mostly assume more than one tier of thematic roles, based on the assumptions that thematic roles are of different kinds. So, nearly always some kind of “action”-tier is assumed containing at least the familiar roles agent and patient. The other tier may be based on spatio-temporal relations containing roles like source, goal, location. Another proposal is given by Grimshaw (1990) who assumes an aspectual tier besides a thematic one. M.-d. approaches have the advantage of a) giving an explanation of co-occurrence restrictions on thematic roles and b) supplying explanations for language phenomena that can be described in terms of (one of) both tiers.

Optimality theory:

Generative theory established by Prince and Smolensky at the beginning of the 1990s. A device generates a list of candidates (e.g. sentences) according to the values of the input. The candidates are judged with respect to a set of universal constraints by running through an evaluator. The constraints are violable but ranked due to their prominence in particular languages. The optimal candidate is that with the least violations of equally ranked constraints and/or the candidate which least violates the highest ranked constraints. \rightarrow Thematic roles play a minor role in OT, mostly a general constraint ranking prototypical agents over prototypical patients is one among several constraints containing prominence relations.

Primitive:

Minimal semantic units that can be discovered via \rightarrow lexical decomposition. Primitives are supposed to serve to determine the syntactic behaviour of an item according to its lexical features that are formulated in terms of primitives. Concerning \rightarrow thematic roles there has been intensive discussion about the question whether they are primitives or not. Recent research tends to a negating answer.

Principles & Parameters theory:

Further development of Chomskyan theories, characterized mainly by its modularity. Among the modules are X-bar theory, case theory, θ -theory, government and binding theory. The grammar consists of different subsystems, shown in the figure below. Part of the θ -theory is the θ -criterion, according to which “[e]ach argument bears one and only one θ -role, and each θ -role is assigned to one and only one argument.” (Chomsky (1981, 36)).

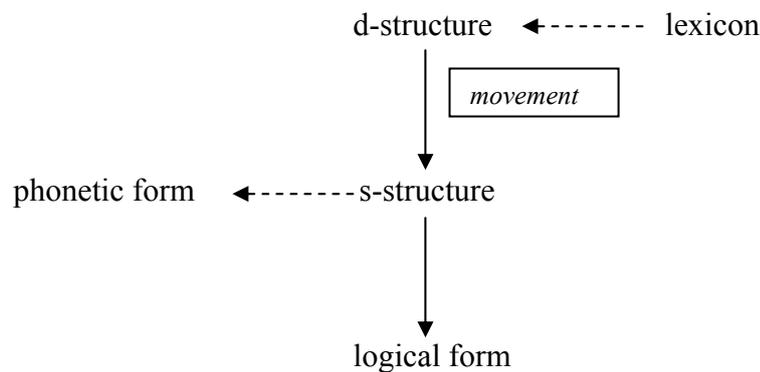


Figure 6.2: *Architecture of the Principles and Parameters theory*

Relational Grammar:

Mainly established by Perlmutter & Postal during the 1970s as a differentiation from Chomskyan grammars. Phrase structures are rejected. Grammatical functions are treated as primitive notions. Relationships between syntax and semantics are represented by arc-pairs, which also reflect derivations. RG is known for its extensive use of hierarchies which are formulated in different dimensions.

Role & Reference Grammar:

Theory of grammar developed by R. van Valin since the 1970s, based on languages like Dyirbal, Lakhota and Tagalog, with original syntactic representations (layers). Linking takes place qua \rightarrow generalized Macroroles which are derived from lexically decomposed verbal semantics and it is also influenced by discourse-pragmatic factors. Rejects phrase structures and \rightarrow grammatical functions because of their lack of universality.

Split intransitivity:

Term introduced by van Valin (1990). Grammatical intransitivity (as the most neutral term for this phenomenon) of the form NP-V occurs in two versions which differ with respect to their status (auxiliary selection, passivization, imperative etc.). There are theories of grammar which capture this difference in terms of \rightarrow thematic roles. While with “unergatives” the only argument of the verb is analysed as being more “agent-like”, the only argument of “unaccusatives” is analyzed as being more “patient-like”. (Please note that the terms in quotation-marks are not neutral with respect to theories of grammar but serve for the illustration.)

Thematic role:

Thematic roles (or semantic roles, θ -roles, thematic relations, deep cases etc.) are generalizations among the arguments of a predicate in order to capture regularities and generalizations between the semantic representation and the syntactic expression of a predicate. Subject to numerous and ongoing controversies as to their number, content, ranking and theoretical status and significance.

UAH:

I.e. the **Universal Alignment Hypothesis**: “There exists some set of universal principles on the basis of which, given the semantic representation of a clause, one can predict which initial grammatical relation each nominal bears.” (Rosen (1984, 40) within \rightarrow RG). In theories of linking which link thematic roles to grammatical functions there is assumed a 1:1 correspondence between both. Roughly, the precursor of the \rightarrow UTAH.

Unaccusative Hypothesis:

“A stratum is transitive if and only if it contains both a 1-arc and a 2-arc. A stratum is intransitive if and only if it is not transitive. A stratum is unergative if and only if it contains 1-arc and no 2-arc. A stratum is unaccusative if and only if it contains a 2-arc and no 1-arc.” Syntactic approach to \rightarrow split intransitivity formulated by Perlmutter (1978, 1983, 151).

UTAH (and RUTAH):

I.e. the **Uniformity of Theta Assignment Hypothesis**: “Identical thematic relationships between items are represented by identical structural relationships between those items

at the level of d-structure. (Baker (1988, 46) within \rightarrow GB: *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.). In theories of linking which link thematic roles into structural positions there is assumed a 1:1 relationship between both. Works with \rightarrow discrete and \rightarrow generalized thematic roles. There is a **Relativized UTAH** as well (Baker (1997, 28ff.) which can be put as follows: Prominence relations among thematic roles are represented by corresponding prominence relations between the role bearers at the level of d-structure. Works with thematic role \rightarrow hierarchies.

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Zusammenfassung/Abstract in German

1. Kapitel:

Diese Arbeit ist der Ausdruck der Annahme, dass syntaktische Regularitäten semantisch motiviert sind. Gleichzeitig wird zur Kenntnis genommen, dass sich syntaktische Strukturen beschreiben lassen, ohne dass dabei Bezug auf semantische Terminologie und Inhalte Bezug genommen werden muss. Allerdings wird auch angenommen, dass diese syntaktischen Regularitäten nicht ohne Bezug auf die Semantik bzw. Diskurs-Pragmatik erklärt werden können.

Die vorliegende Arbeit beschäftigt sich in der Hauptsache mit der Beziehung von Form und Bedeutung, also von Syntax und Semantik, auf Satzebene. Diese Beziehung soll nicht nur beschrieben, sondern zu erklären versucht werden gemäß der Chomsky'schen Definition der Erläuterungsadäquatheit. Als einer der zentralen Begriffe der Schnittstelle zwischen Syntax und Semantik hat sich der der „thematischen Rollen“ herausgestellt.

Ziel der Arbeit ist ein Vergleich derjenigen Theorien von thematischen Rollen, die sich als die einflussreichsten erwiesen haben seit ihrer Erfindung in den 1960er Jahren. Dabei wird sowohl auf die Breite der existierenden Theorien Rücksicht genommen als auch auf ihre verschiedenen Entwicklungsstufen.

Die Arbeit gliedert sich zunächst in ein theoretisches Kapitel, das sich allgemeinen Fragen zur Entstehungsgeschichte der thematischen Rollen und nach ihrer theoretischen Signifikanz zugewendet hat. In Kapitel 3 werden verschiedene Sprachphänomene vorgestellt, die erfahrungsgemäß große Probleme für Theorien thematischer Rollen dargestellt haben und darstellen. Im Zusammenhang mit dieser Präsentation der Daten werden mit den jeweiligen Phänomenen verbundene Fragen zu spezifischen thematischen Rollen diskutiert. In Kapitel 4 werden dann die Theorien der thematischen Rollen selbst diskutiert und ihre Erklärungskraft an den Phänomenen gemessen. Die Theorien erstrecken sich dabei über die Theorien Chomskys über *Case Grammar*, *Relational Grammar*, *Cognitive Grammar*, *Head-Driven Phrase Structure Grammar* und *Lexical-Functional Grammar*. Die diskutierten thematische Rollen-Theorien, die Gebrauch von thematischen Hierarchien machen, sind diejenigen Jackendoffs, *Construction Grammar*, *Lexical Mapping Theory*, *Principles & Parameters/Minimalismus* und Optimalitätstheorie. Generalisierte Rollen werden in der *Role and Reference Grammar* sowie von Dowty und seinen NachfolgerInnen benutzt. Die *Lexical Decomposition Grammar* schließlich macht Gebrauch von der sogenannten *Feature Decomposition*. Das fünfte und letzte Kapitel widmet sich der Frage, wie eine Theorie der

Syntax-Semantik-Schnittstelle ohne thematische Rollen aussehen könnte. Dabei kommen die Ideen des Verfassers zum Ausdruck. Ein angehängtes Glossar gibt kurze Charakterisierungen zentraler Begriffe und Theorien hinsichtlich der Involvierung thematischer Rollen.

Kapitel 2:

Als Etappen, die zur Entwicklung der modernen Form der thematischen Rollen geführt haben (Kap. 2.1), werden Pāninis Grammatik zum Sanskrit von 600 v. Chr. und Blakes Werk von 1930 erwähnt. Beide erkannten und beschrieben sehr früh Regularitäten zwischen Form und Bedeutung. Freges Arbeit in der formalen Semantik hat ebenfalls einen Grundstein gelegt für die Entwicklung, die zum sogenannten Linking-Problem geführt hat. Dieses trat ein mit der Chomsky'schen linguistischen Revolution, die sich vor allem in der Autonomiehypothese manifestiert hat. Diese Hypothese brachte die Frage der Verbindung von Syntax und Semantik mit sich, ebenso wie die Erfindung der thematischen Rollen durch Gruber (1965).

Im zweiten Unterabschnitt werden sowohl eine Arbeitshypothese zur Definition thematischer Rollen als auch eine kanonische Liste der meistgenutzten Rollen mit ihren prototypischen Definitionen gegeben. Weitere Fragen haben den Zweck thematischer Rollen und die verschiedenen theoretischen Konzeptionen thematischer Rollen zum Gegenstand. Im Zusammenhang mit Letzteren werden u.a. die Fragen diskutiert, welche Arten von „Wissen“ involviert sind, wo die theoretische Signifikanz der Rollen liegt oder ob sie Primitive oder komponierte Begriffe sind. Zudem wurde die Frage geklärt, auf welche syntaktischen Einheiten – Kasus, grammatische Funktion, Struktur – thematische Rollen gelinkt werden. Zuletzt wird die manchmal vertretene Annahme zurückgewiesen, dass thematische Rollen zugunsten eines lediglich aspektuell determinierten Linkings aufgegeben werden können. Dennoch ist klar, dass, aber nicht wie die Konzepte Transitivität, Aspekt und möglicherweise auch Kasus mit thematischer Information interagieren. In groben Zügen werden abschließend die Hauptetappen der Entwicklung – angefangen bei Theorien diskreter Rollen über thematische Hierarchien bis hin zu generalisierten Rollen – nachgezeichnet.

Kapitel 3:

Das erste der vorgestellten Phänomene ist *split intransitivity* (geteilte Intransitivität, Kap. 3.1). Diese stellt, wie die anderen Phänomene, eine Herausforderung für angenommene Prinzipien wie die *Uniformity of Theta Assgntment Hypothesis* dar, die besagen, dass identischen thematische (semantische) Informationen auf identische syntaktische Strukturen abgebildet werden. *Split intransitivity* stellt insofern ein Problem dar, als die Argumente der jeweiligen unergativen und unakkusativen Verben thematisch verschieden sind, doch in der overtten syntaktischen Struktur identisch realisiert werden. Ähnlich verhält es sich mit dem

Passiv, das gleiche Semantik bei unterschiedlichen syntaktischen Konstruktionen aufweist (Kap. 3.2). Seine Applikation ist dabei offensichtlich durch Prominenzbeziehungen zwischen Argumenten beschränkt, die sich durch thematische Hierarchien ausdrücken lassen. Die Lokativ-Alternation zeigt verschiedene syntaktische Konstruktionen bei ähnlichen semantischen Argumentstrukturen, die vor allem die Abfolgen der Rollen Lokativ und Thema betreffen (Kap. 3.3). Anders als beim Passiv kann aber nicht die eine Konstruktion von der anderen abgeleitet werden, da sie kleinere Bedeutungsunterschiede aufweisen, die aspektueller Natur sind und die Definitheit der Argumente betreffen. Ein ähnliches Phänomen ist die Dativ-Alternation (Kap. 3.4). Zwei syntaktische Konstruktionen, eine Doppel-Objektkonstruktion und eine Präpositionalobjektkonstruktion, beschreiben ein mehr oder weniger prototypisches Transferereignis. Die Frage ist, ob sie semantisch identisch sind und wie die mit den Begriffen thematischer Rollen erklärt werden kann. Die Dativ-Alternation ist zudem interessant hinsichtlich der Involviertheit von Kasus und ihres Verhaltens bei Passivierung. Das letzte und vermutlich am schwierigsten zu erklärende Phänomen ist das Verhalten von psychologischen Verben (Kap. 3.5). Sie zeigen eine große Variation bezüglich der Abfolge der involvierten Argumente und Kasus. Zudem spielen aspektuelle Faktoren eine entscheidende Rolle in der Argumentrealisation.

Kapitel 4:

Kapitel 4, geordnet nach den Entwicklungsstufen der Theorien, beginnt mit Theorien diskreter thematischer Rollen (Kap. 4.1). Die darin behandelten Ansätze zeichnen sich eher durch den Versuch aus, die von der Syntax projizierte semantische Interpretation zu vereinfachen als durch denjenigen, mögliche Generalisierungen des Linkings zu beschreiben. Die meisten dieser Theorien, die sich durch ihren von Chomsky beeinflussten „Syntaktozentrismus“ (Jackendoff) ausgezeichnet haben, haben dabei von einem „starken“ Lexikon Gebrauch gemacht, das alle scheinbar idiosynkratischen Informationen enthält. Ausnahmen sind Fillmore und Jackendoff. Die genannten Theorien unterscheiden sich teilweise erheblich hinsichtlich der Konzeption, Zahl und Definitionen der involvierten Rollen. Thematische Hierarchien (Kap. 4.2) stellten sich zunächst als gelungener Lösungsansatz für die Probleme der diskreten Rollen-Theorien heraus, da Phänomene wie das Passiv und die Dativ-Alternation nun besser beschrieben und erklärt werden konnten, da es sich bei ihnen um Prominenzrelationen zwischen Argumenten dreht. Offensichtlich hat man aber die Probleme der älteren Theorien – uneinheitliche Konzepte, Zahl und Inhalte thematischer Rollen – übernommen. Zudem wurde keine Einigkeit hinsichtlich der genauen Hierarchie der Rollen erzielt. Multi-dimensionale Ansätze, die verschiedene *tiers* von

thematischen Rollen annahmen, meist ein *action tier* und ein *spatio-temporal tier*, haben viele, aber nicht alle Probleme lösen können. Bis heute scheinen aber generalisierte thematische Rollen am ehesten erfolgversprechend zu sein, um das Syntax-Semantik-Linking angemessen zu erklären (Kap. 4.3). Die oben genannten theoretischen Probleme konnten weitgehend beseitigt werden, obwohl noch immer beträchtliche Unterschiede zwischen den einzelnen Theorien bestehen. Die Vorteile von Dowty's (1991) Proto-Rollen liegen in der Miteinbeziehung zahlreicher Arten von Information in die *entailments* seiner Rollen. Die Weiterentwicklung der Theorie durch verschiedene Nachfolger Dowty's haben sie zu einer gut ausformulierten Linking-Theorie gemacht. RRG bedient sich Makrorollen, die im Gegensatz zu Proto-Rollen ein reines Schnittstellenphänomen sind. Sie fangen sehr elegant Informationen über Aspekt und Transitivität ein, was die Theorie überlegen gegenüber den meisten anderen macht. Allerdings ähneln sich die Probleme der beiden großen Konzeptionen generalisierter Rollen sowohl hinsichtlich theoretischer als auch empirischer Fragen. Beide nehmen eine monokausale Beziehung zwischen Verben und Argumenten an, was der Beobachtung zuwiderläuft, dass Eigenschaften von Argumenten die Bedeutung der gesamten Konstruktion beeinflussen können (was besonders hinsichtlich der Lokativ-Alternation gezeigt werden konnte). Beide Theorien scheitern u.a. an der Oberflächen-Unakkusativität und der *interessieren*-Klasse psychologischer Verben. Zuletzt wurde ein Ansatz diskutiert, der Gebrauch von *Feature Decomposition* macht: *die Lexical Decomposition Grammar* (Kap. 4.4). In ihr werden thematische Rollen dekomponiert in relationale Eigenschaften, über die das Linking geregelt wird. Da die Theorie starken Gebrauch von einem semantisch definierten Kasus macht, erfasst sie eine große Spanne an sprachlichen Phänomenen. Andererseits präsupponiert sie eine detaillierte Typologie von Verbklassen, deren präzise Explikation noch aussteht. Zudem macht sie noch immer Gebrauch von diskreten thematischen Rollen und „holt sich damit ungelöste, alte Probleme ins Haus“.

Hinsichtlich der eingangs formulierten Hypothese kann abschließend folgendes konstatiert werden (Kap. 4.5): Der starke Eindruck, dass die Bezugnahme auf die Semantik einen starken Anstieg der Erklärungskraft der Linking-Theorien mit sich gebracht hat, beweist ihre Validität. Die Faktoren, die das Linking bestimmen, werden immer klarer, und es scheint weder unplausibel noch unwahrscheinlich, dass in absehbarer Zeit das Konzept thematischer Rollen ersetzt werden kann durch eine präzise Untersuchung jedes einzelnen dieser Faktoren und ihrer Interaktion. Dabei handelt es sich wohl um Kasus, Aspekt, Transitivität und einem noch schwammigen Konzept von Kontrolle. RRG, so scheint es, ist diesem Ziel bisher am nächsten gekommen, indem ihre Konzeption der Makrorollen diese Faktoren am besten

erfasst. Zudem haben Makrorollen nur noch entfernt Ähnlichkeit mit den klassischen thematischen Rollen. Dennoch ist damit nur die Richtung der zukünftigen Forschung angedeutet. Und es gibt weit mehr zu erforschen als *split intransitivity*, Passivierung, Argument-Alternationen und psychologische Verben.

Kapitel 5:

In diesem Kapitel wurden vom Verfasser eigene Ideen zu einer Linking-Theorie angedeutet, die keinen Gebrauch von thematischen Rollen macht. Dies soll durch verschiedene Faktoren erreicht werden: a) das Konzept von „Verantwortlichkeit“ als grammatische Kategorie besagt, dass grammatische Regularitäten von pragmatischen Faktoren wie der Zuschreibung von Verantwortung an Menschen beeinflusst werden; b) das Konzept von „Conceptual Composition“ besagt, dass die Beziehung zwischen (semantischem) Prädikat und Argumenten neu definiert werden muss, indem ein Ereignis um Objekte herum komponiert wird, und nicht umgekehrt; c) Kasus besitzt sowohl syntaktische als auch semantische Signifikanz und es sollte möglich sein, durch ihn große Teile des Konzepts thematischer Rollen zu ersetzen. Der Einfluss von Aspekt/Aktionsarten und Transitivity konnte bisher nur angedeutet werden. Die zukünftige Arbeit wird in diese Richtung gehen und es wird sich erweisen, inwiefern diese Ideen auf andere Sprachen übertragen werden können.

Eidesstattliche Erklärung

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