Towards a structural typology of verb classes

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After the introduction, section 2 considers prototypical transitive verbs. Section 3 turns to intransitive verbs and their relationship to transitive ones, and also considers the active-inactive type of argument linking (3.4). Section 4 deals with further argument linking types for transitive verbs: the inverse type (4.1), the salience or voice type (4.2), the positional type (4.3), and the generalized case type (4.4), the latter comprising accusative, ergative and split systems, and the possibility of dative. Section 5 considers ways of marking special semantic classes of verbs lexically. Section 6 discusses how a third argument is integrated, and thus extends the typology of section 4. It deals with the semantic decomposition of ditransitive verbs (6.1) and general principles of constraining it (6.2), considers serial verb constructions and noun incorporation as argument-reducing operations (6.3), turns to constructions where the recipient is treated like the object of a transitive verb (6.4) or differently from the object of a transitive verb (6.5), and closes with a new look on the English 'dative' alternation, which is compared with the double object/serial verb alternation in some West African languages.

1. Introduction:
   The grammar is a set of structural generalizations

What one needs to know about verbs is whether they have one, two, three or even more arguments: intransitive *laugh* has one argument, transitive *see* has two arguments, and ditransitive give has three arguments. If one is concerned with a particular language, one also needs to know how these arguments are realized. Turning from English to Turkish, to Georgian or to one of the indigenous languages of the Americas, one finds quite different argument linking types, i.e. ways in which the arguments of a verb are realized. This article tries to summarize some recent work on both argument structure and argument realization.

The first question is how certain we are that every language has verbs. The majority of linguists is convinced that the existence of two well-distinguished lexical categories, namely verbs and nouns, is one of the most certain universals of human language. Some linguists, however, dispute such a universal claim. They present two kinds of counter-evidence: (i) Some languages do not exhibit clear differences between morphological means that apply to verbs and those that apply to nouns (Sasse 1993a on Cayuga, an Iroquoian language). (ii) Other languages exhibit large sets of lexical roots that function as verbs when combined with an aspect or tense marker, but function as nouns when combined with a definite article (Broschart 1997 on Tongan, an Oceanic language). For a survey of such reservations see Sasse (1993b). A closer inspection of these 'counter-examples', however, shows that these languages do not represent exceptions to the above-mentioned universal. Their grammar shows clear asymmetries between verbs and nouns, in the morphological behavior, the incorporation of nouns into verbs, and the forming of new nominal stems derived from verbs (Wunderlich 1996a, Baker 2003). In a recent debate on Munda (Austroasiatic languages of India), for which the existence of lexical categories is also questioned, Evans & Osada (2005a: 384) conclude that "Munda clearly distinguishes nouns from verbs".

There is of course some semantic background for this distinction. Prototypically, verbs (such as *sleep, stay, hit, give*) denote temporally changing entities (events or states) in which one or more objects are participating, while nouns (such as *man, house, bottle, salt*) denote temporally constant entities (objects determined merely spatially) which can participate in events or states. Usually, a complex scene where a man is sleeping is decomposed into the temporal predicate SLEEP (with an argument slot) and some instance of the nontemporal predicate MAN (an argument that fills the slot); SLEEP is associated grammatically with a verb and MAN with a noun, rather than the other way around. Nearly every language encodes 'a man$_N$ sleeps$_V$' rather than 'a sleep$_N$ occurs-to-man$_V$'.

However, the classification into verbs and nouns is not purely semantics-driven. Given the rich conceptual variation into punctual vs. extended events, on-going activities vs. achievements, permanent vs. temporally restricted states, masses vs. individual objects, concrete vs. abstract activities/ objects one must wonder why there are just two major lexical classes rather

than, say, eight or ten. Moreover, a closer inspection of the vocabulary of a language shows that some items seem to be wrongly classified: nouns such as *journey, war*, and *game* denote events rather than objects, while verbs such as *resemble, exist, be above*, and *be tall* do not denote events. One point to be made here is that some languages (such as English) in addition to verbs and nouns also have prepositions (*above*P) and adjectives (*tall*A), so that a more detailed classification arises. Other languages, such as Chinese, do not make such a clear addition to the categorial inventory.

More important is another point: lexical categories evolve in a set of lexical items from generalization towards certain structural patterns, a fact that can be summarized by a distinctive grammatical feature by which the lexicon is partitioned into two classes, a designated one (such as verbs) and the remaining (unmarked or default) class (called nouns). Such a classification is more robust and more economical than a purely semantic classification, however, it leaves certain 'less motivated' assignments, which in the history of a language may survive as relics. A child that starts out to learn the words of a language seems to need only a short time to detect the verb class vs. the noun class, and as soon as this happens, the child produces overgeneralizations, i.e., classifies not always in accordance with the language to be learned. If one has acquired the basic classification of the vocabulary, there is no further need to motivate it semantically. Only for a new item does the question arise to which class it belongs, which is mostly decided on the basis of semantic (or, sometimes, phonological) similarity to already existing items – if a semantically similar word is classified as a verb, the new item will also be assigned to verbs. Furthermore, semantic factors continue in playing a contextual role when the particular meanings of items are in focus.

Within the class of verbs, various kinds of semantic subclassification come into mind: verbs with animate or inanimate arguments, verbs of movement, position or placement, verbs of manipulation, experience, perception, communication, and so on. Nearly none of these possible semantic factors is decisive for the further grammatical subclassification of verbs, except animacy in some languages. For instance, the Algonquian languages from North America make a formal distinction between stems with animate and those with inanimate objects (e.g. *waapam* 'see sth. animate' vs. *waapaht* 'see sth. inanimate' in Plains Cree).

The most robust subclassification of verbs concerns the number of arguments: intransitive verbs have one, transitive verbs have two, and ditransitive verbs have three nominal arguments. (Verbs with zero valency are extremely rare – one possible semantic class of this kind are weather verbs, such as Latin *pluit* 'it rains', however, note that English uses here an expletive pronoun, which masks the verb to be intransitive.) Besides that, verbs are subclassified of whether they take a clausal complement (verbs of mental attitudes), which under some conditions can also be reduced to an infinitive or another non-finite verb form (*he hopes to win* vs. *he hopes that he will win*). Furthermore, at least some languages have a subclass of verbs that take a locational argument, e.g., a prepositional phrase (*he sits on the bank, he puts the cans on the bank*). Sometimes one also finds a class of verbs that take prepositional objects in which the preposition is lexically fixed (without contributing a particular meaning): *an jdn denken* 'think at someone', *auf etw. hoffen* 'hope for sth.', *an etw. glauben* 'believe in sth.'

If two nominal arguments occur with a verb, the meaning of the verb sometimes requires one argument to be animate and the other to be inanimate (*read, sew, enter*), however, more than often this is not the case. The second argument of *see,* for instance, can be inanimate or animate; in the latter case, the two arguments can in principle be exchanged, thereby shifting the intended reading (*the man saw the lion* and *the lion saw the man* mean different things). It is even possible that a verb has three arguments being similar in their nature; for example, *send* and *introduce* allow any ordering of three arguments referring to a person (*the neighbor sent/ introduced the woman to a specialist*; *a specialist sent/introduced the neighbor to the woman*; etc.).

If the number of arguments counts, there must be some way to make the arguments recognizable in their specific role: which nominal functions as which argument. In English, this decision is made by position: usually the 'subject' precedes the verb, and the 'object' follows it. Other languages primarily use morphological case on nominals, or they use pronominal affixes or clitics attached to the verb. The particular device that maps argument roles onto morpho-

syntactic patterns is called 'argument linking'. Various types of argument linking are known, some of which will be discussed in section 4.[1] Each argument linking type represents an economic way of avoiding ambiguities with verbs having more than one nominal argument. As we will see, each of these devices simultaneously enforces a certain subclassification of verbs according to structural parameters.

In any case, the classification of verbs seems to depend more on the possible realization patterns for their arguments than on inherent semantic features. Sometimes, however, it is possible to use a formal device to mark an exceptional semantic class of verbs. For instance, German has a small class of intransitive experiencer verbs with accusative marking, which is unusual for intransitives: *mich friert* 'I am cold', *mich fröstelt* 'I am shivering with cold'.

Among the various argument linking types one type is found that seems to be rather uneconomical: the portmanteau-type. A portmanteau affix simultaneously specifies more than one type of information. For instance, Latin passive is realized by a set of suffixes that inform us about both passive and person-number (*ama-mini* 'you (pl) are loved', with *-mini* '2pl. PASS'). Another type of portmanteau affix simultaneously specifies more than one argument. Hungarian uses the single suffix *-lak/-lek* to express the combination I→you[2], similarly, Ayacucho Quechua uses the suffix *-yki* to express this combination, see (1a,b).

(1)   I→you portmanteau suffixes in Hungarian and in Quechua
          a.   szeret-lek   'I love you (sg/pl).'
          b.   riku-yki   'I see you.'

To express the combination I→you is very special because here the speaker 'acts upon' the addressee in the propositional content similar to the speech act itself, so it does not wonder that a portmanteau morpheme adapted to this special task is found in several languages. However, if all possible combinations of subject values and object values are expressed by portmanteaux, the number of these affixes increases, and it is not possible for the learner to make any separate generalizations about subjects and objects. That portmanteau affixes in general are uneconomical can be seen from a simple calculation. With three persons (1st, 2nd, and 3rd person) and two numbers (singular and plural) one would need at most 6 affixes for the subject and 6 affixes for the object (together 12 affixes); however, there are 28 possible combinations (if all reflexive settings such as I/we→I/we and you→you are excluded). The portmanteau linking type, therefore, is strongly disfavored.

However, Kiowa, a Tanoan-Kiowa language spoken in west central Oklahoma, obviously exhibits this type, as illustrated by the examples in (2). Here, the prefixes simultaneously specify person and number of the two arguments of a transitive verb (2a), and in addition, they specify the number (dual or plural) of a third argument (2b).

(2)   Portmanteau prefixes in Kiowa (Watkins 1984)
          a.   Transitive verbs: a single prefix encodes information about both arguments
              (*góp* 'hit').

èm-góp 'I hit you/him'	é-góp 'you/he hit me'
èm: 1sg → 2 ∨ 3sg	é: 2 ∨ 3sg → 1sg
dɔ́-góp 'you/he/they hit us'	gɔ̀-góp 'we/he/they hit you'
dɔ́: 2 ∨ 3 → 1pl	gɔ̀: 1pl ∨ 3 → 2sg

          b.   Ditransitive verbs: a single prefix encodes information about all three arguments
              (*ɔ* 'give', *kut* 'book')

kút né-ɔ́ 'you/he gave me two books'	kút nén-ɔ́ 'I gave you/him two books'
né: 2 ∨ 3sg / 1sg/ dl	nén: 1sg/ 2∨ 3sg/ dl

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[1]   My classification of argument linking types goes back to Wunderlich (2002b).
[2]   The arrow is used to express subject→object information.

kút bédê-ɔ́ 'you (pl) gave me/us/him two books' bédê: 2pl/ 1 ∨ 3sg/ dl	kút gyâ-ɔ́ 'they gave me/us/him some books' gyâ: 3pl/ 1 ∨ 3sg/ pl

This situation is not so bad from the perspective of the speaker (in terms of economy) because nearly all prefixes are ambiguous (e.g., cover both 2nd person and 3sg), but that is certainly not welcomed from the perspective of the hearer. Therefore, Kiowa is not a language that invites people to participate. Indeed, the population is small and isolated (according to the 1990 census, only about 1,000 middle-aged and older speakers out of a population of 6,000). Probably, the observed prefixes are the result of massive fusion (forced by the pressure towards 'one prefix only'), and the portmanteau type observed in this language is not a real candidate of typological choice.

In the following, I will disregard such extreme but unfelicitous cases and rather concentrate on the more frequent structural types. I will start with prototypical transitive verbs in section 2 because these verbs constitute the core of a grammar. I then turn to intransitive verbs, including their relationship to transitive ones, in section 3; properties of these verbs determine what is known as active-inactive type. Further argument linking types, which all are based on transitive verbs, are considered in section 4. Section 5 demonstrates how special semantic classes can be marked by morphosyntactic means already available for a language. Section 6 is concerned with the structural possibilities of dealing with a third argument in ditransitive verbs.

2. Prototypical transitive verbs are in the center of a grammar

Transitive verbs, which denote a relation between two participants of an event, belong to the most 'ingenious' inventions of human language. They are in the center of any grammar; if they were absent from the lexicon, the grammar would be much simpler than it actually is. Typical (or canonical) transitive verbs are *chase, hit, kill*, *eat, kiss,* and many more. They do not form a characteristic semantic class (representing similarities in some basic field of activities such as hunting-gathering, nourishing, social and sexual behavior), but rather reflect a very deep structural generalization (which must have been an important step in the evolution of human language). Every language allows the enrichment of the class of transitive verbs by less canonical items such as *see, hear, meet, ask, obtain, surround*, as well as the derivation of new transitive verbs such as *enlarge* and *to open* – although the languages differ widely in the details. So what is the common property of transitive verbs?

Canonical transitive verbs are two-place predicates with two clearly distinguished argument roles, which is illustrated with the verb *eat* in (3).[3]

(3) $\lambda y\, \lambda x\, \text{EAT}(x,y)$

x (= the eater) is the higher argument, and y (= the eaten) is the lower argument.

Each λ abstracts over an argument and thus represents the argument role or slot. All λ-roles (λy, λx) must be saturated in the course of composition, i.e. the two arguments must be realized by some linguistic expressions.

For instance, one can first apply 'eat' on 'the apple', and then apply the result on 'John', which yields 'John eats the apple'.

(4)   a.   (*eat the apple*): $\lambda y\, \lambda x\, \text{EAT}(x,y)$ (the.apple) = $\lambda x\, \text{EAT}(x, \text{the.apple})$
        b.   (*John* (*eats the apple*)): $\lambda x\, \text{EAT}(x, \text{the.apple})$ (John) = $\text{EAT}(\text{John, the.apple})$

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[3]   We say that *apple* denotes a certain individual fruit, which is represented as $\lambda x\, \text{APPLE}(x)$, where x counts as the referential argument of the noun. It is manipulated (specified and bound) by the functional categories on the noun, such as determiners and quantifiers (*the apple, every apple*). Similarly, one can say that *eat* denotes a certain individual event, which is represented as $\lambda y\, \lambda x\, \lambda e\, \text{EAT}(x,y)(e)$, where e counts as the referential argument of the verb. It is manipulated (specified and bound) by the functional categories on the verb, such as aspect, tense, and mood. Since this article is concerned with the argument structure of verbs, which I believe to be independent of the verb's capacity of denoting events, the referential argument of verbs is disregarded.

An important observation is that transitive verbs are always asymmetric. It is easy to make a semantic distinction between the eater and the eaten, but is not so easy to make a semantic distinction between the two persons who marry each other. MARRY is a symmetric predicate (if John married Anne, than Anne also married John), nevertheless, the verb *marry* is in the same way grammatically asymmetric as *eat*: in 'John married Anne', 'John' realizes the higher argument, and 'Mary' the lower one. This is the cost for putting *marry* into the class of transitive verbs.

The source for the generalization to the concept of transitive verb is of course semantic. In a prototypical transitive verb (such as *eat* rather than *marry*), the higher argument functions as agent or actor ('the participant which performs, effects, instigates, or controls the situation denoted by the predicate', Foley & Van Valin 1984: 29), while the lower argument functions as patient, or undergoer, or affected. Several theories try to describe the realization of arguments as a mapping from a semantic hierarchy of thematic or eventive roles to a hierarchy of grammatical functions (subject, object) or cases (nominative, accusative). Thematic hierarchies include various roles such as agent, patient, theme, experiencer, beneficiary, recipient, goal, source, but it is discussed controversially how these roles are demarcated and what their exact ordering is (Grimshaw 1990, Jackendoff 1990; see also Bornkessel et al. to appear). Only two proposals succeed in reducing the number of thematic roles to just two (corresponding to the two arguments of a transitive verb): the two protoroles in Dowty's (1991) account (protoagent and protopatient) are determined by the relative weight of several semantic factors, while the two macroroles in the account of Foley & Van Valin (1984) (actor and undergoer) reflect semantical *and* grammatical factors. Eventive roles account for the participation of arguments in possible subevents such as an ongoing activity and a change of state (Pustejovsky 1991, among others). A summary is given in (5).

(5)   The asymmetry of transitive verbs

hierarchy:	the lower argument (nearer to the verb)	the higher argument
protoroles:	protopatient	protoagent
macroroles:	undergoer	actor
conceptual inferences:	affected	controller
eventive roles:	specifies the result	specifies the ongoing activity
grammatical roles:	object	subject
case (accusative system):	accusative	nominative
case (ergative system):	nominative	ergative
features:	**+hr**	–hr
	–lr	**+lr**

As a facon de parler, it is often convenient to use the semantic notions of agent vs. patient, or the more structural notions of subject vs. object. However, one must be careful to avoid mis-interpretations: in 'a wall surrounds the garden', the higher argument, namely 'the wall', is certainly not an agent semantically, and in 'the bear was killed', 'the bear' is considered to be the (grammatical!) subject, although it certainly functions as patient. The most neutral way is to encode the asymmetry (i.e. the hierarchy of roles) by two simple relational features: +hr 'there is another role which is higher than this one' (for short: 'there is a higher role') characterizes the lower argument, while +lr 'there is a lower role' characterizes the higher argument (Wunderlich 1997a).[4] These features, representing 'abstract case', have the advantage that their positive

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[4]   +hr could as well be spelled out as 'I am a lower role'. The particular choice of notation is due to a historical accident. In any case, the comparative features are different from Kiparsky's (1992, 1998) superlative features such as +HR 'I am the highest role' (which is identical to our –hr). The reason to deviate from Kiparsky's proposal is a more principled conception of markedness. As we will see in the following, the plus values in our system correlate with marked instances, and the minus values

value corresponds to the information of morphological case: accusative bears the feature +hr (and thus marks the lower argument), while ergative bears the feature +lr (and marks the higher argument). The subject of an intransitive verb is designated as –hr,–lr; therefore, neither accusative nor ergative are compatible with this argument. However, the nominative (bearing no feature specification) is compatible with an intransitive subject; it is indeed compatible with any argument. But in the morphology usually the most specific option is chosen: if accusative is possible, then it should be chosen.

This specification of accusative and ergative conforms to the traditional way in which these notions are used cross-linguistically. If the agent (A) is realized like the subject of an intransitive verb (S), and the patient (P) is realized differently (by means of a morphological case, a postposition, or a pronominal affix), the marker that encodes P is called 'accusative' (ACC). However, if P is realized like S, and A is realized differently, the marker that encodes A is called 'ergative' (ERG), see (6). The respective other type of realization (regardless of whether it is specifically marked or simply unmarked, for instance, if the stem is used) is called 'nominative' (NOM).

(6)   The definitions of 'accusative' (ACC)   vs.   'ergative' (ERG)

	ACC	NOM		NOM	ERG
intransitive		S		S	
transitive	P	A		P	A

Accusative is illustrated with an example from German (7), and ergative with one from Basque (8). Note that the auxiliary in Basque agrees with all the structural cases occurring with a verb; 'E' indicates agreement with ergative, and 'N' indicates agreement with nominative.

(7)   Accusative in German
        a. intr.:   Hans schläft. 'John sleeps.'
        b. trans.:   Hans   sieht   ein-**en** Mann.
                        John   sees   a-**ACC** man
                        'John sees a man.'

(8)   Ergative in Basque
        a. intr.   Jon   joan   da.
                        John   go.PERF   AUX.3N
                        'John went.'
        b. trans.   Jon-**ek**   zopa   jan   du.
                        John-**ERG**   soup   eat.PERF   AUX.3N.3sgE
                        'John ate the soup.'

The definition in (6) suggests that accusative and ergative are complementary to each other, so one must wonder why accusative and ergative are unevenly distributed among the languages of the world. Languages with accusative are more frequent than those with ergative. It seems that A is the more prominent argument, and that it is preferred to realize the more prominent argument by nominative because it can then much easier function as syntactic pivot, which controls the formation of more complex structures (such as coordinations, relative clauses, or control verb constructions of the type *I want to see him*). This inherent asymmetry is expressed by the scale +hr > +lr 'It is better to mark a lower argument (an object) than a higher argument (the subject)', see section 4.4 below.

It is important to notice that accusative and ergative are not at all universal notions. Although the majority of languages seem to have developed some device that can properly be described by these terms, there are nevertheless many languages with well-defined argument

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with unmarked instances. This is in line with phonological conventions according to which, e.g., a voiced consonant (such as d, b or g in contrast to t, p, k) is marked by a plus value (+voiced) rather than by a minus value such as –voiceless.

linking types of different properties. It is therefore interesting to study these different types and to see how they frame possible generalizations of verb classes.

One further remark is at place here. Proponents of a semantic account of argument structure often deny that the arguments of a verb are ordered. I think that the assumption of a strict ordering is conceptually much simpler than the alternative of assuming variation in ordering, or considering the arguments to be an unordered set. One reason is that a strict lexical ordering allows a simple mapping onto linear syntactic order. As one can indeed observe, the default ordering in the syntax mostly conforms to argument hierarchy, regardless of whether the arguments are marked by case or not. For instance, in (7b) and (8b) the object follows the subject, and so it does in the respective English translations. Moreover, the Barss & Lasnik (1986) tests – if properly adapted for the language under question – are able to identify the ranking of arguments independently in most cases. These tests include anaphoric binding, bound pronouns, weak crossover, negative polarity items, and multiple questions, and are briefly illustrated in (9).

(9)   Tests for argument hierarchy. (The co-indexed expressions are assumed to refer to the same entity.)
   a.   The ape sees himself.
        *Himself sees the ape.
   b.   All mothers$_i$ like their$_i$ baby.
        *Their$_i$ mothers like all children$_i$.
   c.   Which$_i$ man beats his$_i$ son?
        *Whose$_i$ son did his$_i$ father beat?
   d.   No one ate anything.
        *Anyone ate nothing.
   e.   Who prefers what?   What disturbs who?
        *What does who prefer?   *Who does what disturb?

These tests can also be applied to show the relative ordering of two objects in a verb with three arguments. It is still open to discussion to what extent these tests are sensitive to the semantic hierarchy of arguments, or merely to morphological asymmetry or syntactic ordering. I will come back to this issue in section 4.1 when I discuss inverse morphology.

3. Intransitive verbs reflect semantic classes

Intransitive verbs are simpler than transitive ones because they have only one argument. As I pointed out above, a grammar does not start with the intransitives because they do not show the features of ordering and asymmetry. However, the intransitives are interesting for their own. They most clearly show the possibilities and effects of semantic classification, they constitute the basis of intransitivizing vs. transitivizing morphology, and they give rise to one of the major types of argument linking.

3.1 Two or four classes of intransitive verbs?

Regarding the grammatical behavior of intransitive verbs, many languages exhibit just two classes, whereby two types of semantic criteria play a role. In Lakhota, a Siouan language, one finds a distinction between agentive and nonagentive intransitives (10): in the 1st or 2nd person, agentive verbs encode their subject differently from nonagentive verbs (which is discussed in more detail in section 3.4). In contrast, the Mayan language Yukatek shows a distinction according to inherent aspect (11): inherently imperfective verbs take the perfect marker -(*n*)*ah* but are unmarked in the imperfect, whereas inherently perfective verbs take the imperfect marker -*Vl* (with the vocalic segment V underlying vowel harmony) but are unmarked in the perfect.

(10)   Intransitive verbs of Lakhota, ordered according to agentivity (Van Valin 1977)
   a.   *agentive verbs*   b.   *nonagentive verbs*
        hi   arrive   hãska   be tall
        iyotaka   sit down   hĩxpaya   fall down

psica	jump	ile	burn
slohã	crawl	khata	be hot
thasosa	spit	puza	be dry

(11)   Intransitive verbs of Yukatek, ordered according to telicity (Krämer & Wunderlich 1999

    a. *inherently imperfective verbs* b. *inherently perfective verbs*

ʔaalkabʔ	run	ʔeem-el	descend
balakʔ	roll	ʔok-ol	enter
héʔesíin	sneeze	kim-il	die
kiritsʔ	squeak	kʔuch-ul	arrive
naay	dream	lubʔ-ul	fall
nóokʔ	snore	lukʔ-ul	leave, escape/flee
ookʔot	dance	naatsʔ-al	approach
tóoʃ	rain	sih-il	be born
tʃeʔeh	laugh	tʃʔiih-il	grow
ʃikʔnal	fly	waakʔ-al	explode, burst

Obviously, Lakhota and Yukatek make a different cut in the set of intransitives. The two classes of Lakhota contain both inherently imperfective and inherently perfective verbs, and the two classes of Yukatek contain both agentive and nonagentive verbs. These examples thus suggest a semantic cross-classification of intransitive verbs into four classes, a classification which seems to be exhaustive, although most languages do not reflect all these possibilities in their grammar.

All formal classes of a language derive from certain generalizations forced by prototypical instances, and so do the intransitive verb classes. In the course of lexicalization and subsequent semantic shift, however, certain items may turn out to be 'wrongly' classified semantically; they remain as idiomatic. Note also that one of the Lakhota classes includes statives, whereas statives of Yukatek form a separate class.

The cross-classification in the set of intransitive verbs suggested by the examples above (and proposed by Dowty 1991) is summarized in (12) and there illustrated with some English examples. The distinction agentive-nonagentive is represented by the feature [control], which is associated with the subject of the verb; [+control] verbs denote an event that is brought about by an agent. Transversely, the distinction perfective-imperfective is represented by the feature [telic], which is associated with the event denoted by the verb; [+telic] verbs denote an event that brings about a certain result. (One can decompose these verbs by means of the predicate BECOME, so that DIE is represented as BECOME DEAD.) Since control is often associated with an ongoing activity, and a result with the absence of an agent, there is a semantic correlation between [+control] and [−telic], and, vice versa, between [−control] and [+telic]. Correspondingly, one finds more items in the [+control,−telic] and the [−control,+telic] classes than in the two other ones.

(12)   Cross-classification of intransitive verbs

	agentive [+control]; λx^{+contr} VERB(x)	nonagentive [−control]; λx^{-contr} VERB(x)
[+telic]; BECOME	*come, stand up*	'unaccusatives': *arrive, die, fall, grow*
[−telic]	'unergatives': *dance, laugh, run, speak*	*lie, stink*

Syntacticians often distinguish between 'unaccusative' and 'unergative' verbs (in considering them as would-be transitives). The 'unaccusatives' are said to have an underlying object that cannot receive accusative; correspondingly, the 'unergatives' are said to have an underlying subject that cannot be realized by ergative (just because accusative and ergative are special for

transitive verbs).[5] This distinction seems to correlate best with the two classes characterized by [+control, −telic] and [−control,+telic]. The notion of an 'underlying object' of an intransitive verb, however, remains doubtful, since what is meant is a semantic distinction somewhat reflected in the grammatical behavior of verbs.

Nearly every language shows some grammatical reflexes of unaccusativity vs. unergativity. In German, one finds a distribution of the properties given in (13) roughly into two classes, which have been associated with the notions 'unergative' and 'unaccusative' (Haider 1985). The members of one large class of intransitives can be passivized, can undergo *er*-nominalization, have *haben* 'have' as the perfect auxiliary, and their participles cannot function as attributes. The members of another large class of intransitives behave in every respect conversely: they cannot be passivized, cannot undergo *er*-nominalization, have *sein* 'be' as the perfect auxiliary, and their participles can function as attributes. This distribution is illustrated with the examples in (14).

(13) The grammatical behavior of intransitive verbs in German (tendencies)

	unergatives (+control,−telic)	unaccusatives (−control,+telic)
have a passive	yes	no
undergo *er*-nominalization	yes	no
allow an attributive participle	no	yes
select the perfect auxiliary	*haben*	*sein*

(14)

unergatives	unaccusatives
Im Sommer wurde oft getanzt. Passive of 'In the summer they often danced.'	**Im Sommer wurde schnell gewachsen.* Passive of 'In the summer they grew fast.'
die besten Tänzer 'the best dancers'	**die langsamsten Wachser* 'the slowest growers'
*die in der Luft getanzten Schmetterlinge 'the in the air danced butterflies'	*die am Haus gewachsenen Pflanzen* 'the at the house grown plants'
Sie haben oft getanzt. Perfect of 'They danced often.'	*Sie sind schnell gewachsen.* Perfect of 'They grew fast.'

As (15) illustrates, there are also verbs that undergo passive but select for the auxiliary *sein* 'be', and (16) shows verbs that do not undergo passive but select for the auxiliary *haben* 'have'. *Aufstehen* 'stand up' is both agentive and telic, whereas *liegen* 'lie' is both nonagentive and static.

(15)　[+control,+telic] intransitives in German
　　a.　Von niemandem wurde aufgestanden.
　　　　passive of 'Nobody stood up.'
　　b.　Er **ist** schnell aufgestanden.
　　　　perfect of 'He stood up fast.'

(16)　[−control,−telic] intransitives in German
　　a.　*Von niemandem wurde im Bett gelegen.
　　　　passive of 'Nobody lied in the bed.'
　　b.　Er **hat** im Bett gelegen.
　　　　perfect of 'He lied in the bed.'

These examples suggest that the possibility of passive depends on the feature [+contr], whereas the auxiliary sein 'be' is selected if the feature [+telic] is present. (Again, there may be idiomatic verbs for which no prediction can be made on semantic grounds.) If that is true, the set of

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[5]　The unaccusative verbs were first called 'ergative' verbs (Burzio 1981, 1986, den Besten 1984, Keyser & Roeper 1984). The notions 'unaccusative'/'unergative' go back to Perlmutter & Postal (1984).

the four criteria would be characteristic for the four classes in (12) rather than the two classes in (13), which have been suggested by syntacticians. Since *er*-nominalization patterns with the possibility of passive, and the possibility of an attributive participle patterns with the choice of *sein*, no more than four classes need to be assumed. These four classes turn out to be determined by semantic rather than syntactic criteria, as Kaufmann (1995a) has pointed out.

3.2 The relationship between intransitives and transitives

Many intransitive verbs can be transitivized, and many transitive verbs can be intransitivized. Some of these shifts have no overt marking on the verb. But many languages have a transitivization marker, and often one finds two (or even more) of these markers: the causative, which adds an agent functioning as causer, and the applicative, which adds an object of some sort (a resultative object, a beneficiary, a possessor, a location or even an instrument). Transitive verbs formed from intransitive ones are mostly prototypical in the sense of section 2, and those that undergo intransitivization (overtly marked or not) again are mostly prototypical transitives. Thus, the property of control seems to play a crucial role: [+control] marks the presence of an agent, and [−control] marks the presence of an (affected) object. The relationship between transitives and intransitives can then be systematized as in (17); this relationship is overwhelmingly symmetric.

(17)   Intransitive-transitive shifts

	+control	−control
intransitive	λx VERB(x)	λy VERB(y)
θ	θ	θ
transitive	λy λx VERB(x,y)	λy λx VERB(x,y)

The four types of shift represented in (17) are the following:[6]

(a)   [+control] intransitives add a lower argument, a so-called 'cognate' or 'internal' object (*dream a nightmare, dance Tango*);

(b)   [−control] intransitives add a higher argument, an agent or causer (*dry the shirts, gallop a horse*);

(c)   transitive verbs with subject-related meaning allow the existential binding of the object (object deletion or antipassive), which yields a [+control] intransitive (*he was eating, I can see again*);

(d)   transitive verbs with object-related meaning allow the absence of the subject (subject deletion or anticausative/middle), which yields a [−control] intransitive (*break, ring*).

(18) illustrates these possibilities with examples from German.

(18)   *intransitive*   *transitive*

    a.   Sie fuhr schnell.   →   Sie fuhr den Fiat schnell.
         'She drove fast.'   'She drove the Fiat fast.'

    b.   Die Wäsche trocknete.   →   Sie trocknete die Wäsche.
         'The shirts dried.'   'She dried the shirts.'

    c.   Sie aß langsam.   ←   Sie aß die Suppe langsam.
         'She ate slowly.'   'She ate the soup slowly.'

    d.   Die Glocken läuteten.   ←   Sie läutete die Glocken.'
         'The bells were ringing.'   'She rung the bells.'

For [−control] verbs it is not always clear whether the basic verb is intransitive or transitive, i.e., whether it belongs to class (b) or (d). Intransitive *trocknen* 'dry' is a +telic verb derived from the adjective *trocken* 'dry'; it denotes a process possible without human instigation, and can therefore classified as a basic intransitive. Verbs of this class can easily be transitivized, which is the background for considering them to have an 'underlying object' – the subject of the

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6   The relationship between items that undergo the [-control] shifts has been studied cross-linguistically by Haspelmath (1993) and Comrie (2006).

intransitive verb becomes object of the transitive one; in other words, the transitive verb has an object-related meaning. In contrast, *läuten* 'ring', although it also derives from an adjective (*laut* 'loud'), is [−telic]; it became idiomatic (for ringing bells) in the history of German and was already transitive in Old High German; since it denotes a process that usually needs a human instigator it is classified as basic transitive. (This is not necessarily true for English *ring*.)

A further possibility not considered so far is that the two variants coexist, forming a hybrid (ambitransitive) verb. This can especially be expected for deadjectival verbs. From adjectives both intransitive and transitive verbs are derivable, and only conceptual factors determine whether the verb is preferred as intransitive (*welken* 'fade', *reifen* 'ripe') or transitive (*leeren* 'empty', *öffnen* 'open'); nothing excludes that both options are equally possible (*enlarge, widen, cool off*). Such a hybrid pattern for deadjectival verbs could have been generalized to cover also underived verbs such as *brechen* 'break', which also has both options.

For the transitive variants of basically intransitive verbs it is evident that they are lexically decomposed. Class-a transitive verbs, derived from an agentive intransitive (unergative) verb, not only add a cognate object but also some predicate that licenses this object. The predicate COGNATE in (19a) allows participants that have an internal relationship to the event denoted by the base predicate; e.g., possible cognates of DRIVE are vehicles (*drive a car*), transported persons/objects (*drive the minister/the luggage*), or distances (*drive a mile*). Similarly, class-b transitive verbs, alternating with a nonagentive intransitive (unaccusative) verb, have the predicate ACT (denoting some unspecific action) to license the causer/agent.

(19) The decomposition of transitive verbs derived from intransitives
  a. *fahren* 'drive': $\lambda y\, \lambda x^{+contr}$ {DRIVE(x) & COGNATE(y)}
  b. *trocknen* 'dry': $\lambda y^{-contr}\, \lambda x$ {ACT(x) & BECOME DRY(y)}

Most transitive verbs can undergo passivization, which binds the subject existentially (*be eaten, be broken*), as well as certain variants of the middle, which suppresses the subject (e.g. by inherent reflexivization, where the subject is identified with the object (*wash, dress*)). Derived transitives nearly always allow passivization, as shown in (20). With respect to the middle (21), German and English differ: German usually marks this operation by an overt reflexive, while English does not. (English does not have lexical reflexives such as *sich schämen* 'be ashamed', *sich fürchten* 'fear'.)

(20) Passive of derived transitives of German and English
  a. Das Auto wurde schnell gefahren.
      'The car was driven fast.'
      $\lambda y\, \exists x$ {DRIVE(x) & COGNATE(y)}
  b. Die Wäsche wurde im Garten getrocknet.
      'The shirts were dried in the garden.'
      $\lambda y\, \exists x$ {ACT(x) & BECOME DRY(y)}

(21) Middle
  a. Das Auto fuhr sich [REFL] gut.
      'The car drove well.'
  b. Er kleidete sich [REFL] schick.
      'He dressed trendy.'

Cross-linguistically, the relationship between intransitives and transitives is subject to much variation. Some languages mark all transitive verbs by means of a transitivization affix, other languages classify into basic intransitives and basic transitives but always mark a shift. There are also languages that mark a shift only in a few instances (like German in the inherent reflexives). At the extreme end, there would be languages that never mark a shift. Near to this extreme is Basque, which never marks intransitivization, as illustrated in (22b). The intransitive use of 'clean' has two readings: the passive reading (i) and the inherent reflexive reading (ii), which are represented here by a semantic formula.

(22)   Intransitive readings in Basque (Joppen & Wunderlich 1995:144)
      a. Jon-ek   kotxe-a   garbi-tu   du.
          John-ERG   car-DET   clean-PERF AUX.3N.3sgE
          'John cleaned the car.' $\lambda y\, \lambda x$ {ACT(x) & BEC CLEAN(y)}
      b. Garbi-tu   da.
          clean-PERF AUX.3N
          i.   'He/it was cleaned.' $\lambda y\, \exists x$ {ACT(x) & BEC CLEAN(y)}
          ii. 'He cleaned himself.' λx {ACT(x) & BEC CLEAN(x)}

Basque has also a class of hybrid verbs that shift between intransitive and transitive readings without any marking (including *igo* 'move.up/take.up', *jais* 'move.down/take.down', *hil* 'die/ kill.PERF', among others).

(23)   Intransitive-transitive hybrids in Basque (Joppen & Wunderlich 1995:143)
      a. Jon   igo-tzen   da.
          John   move.up-IMPF AUX.3N
          'John moves up.'
      b. Jon-ek   maleta-k igo-tzen   ditu.
          John-ERG suitcase-pl take.up-IMPF   AUX.3plN.3sE
          'John takes the suitcases up.'

However, Basque also has developed the causative morpheme *-eraz* (from the verb *eragin* 'make/let'), which is productively used with all types of verbs. For the hybrid class of verbs one can assume that the transitive member is causativized without marking, probably because these verbs are historically old. If these verbs are used intransitively, they receive the two intransitive readings available for all transitive verbs (as demonstrated in (22b)), and furthermore, a third 'anticausative' reading because of their nature as hybrids (iii).

(24)   Three intransitive readings with Basque hybrids (Joppen & Wunderlich 1995:144)
         Itziar   hil   da.
         Itziar   die/kill.PERF 3N.AUX
         i.   'Someone has killed Itziar.' $\lambda y\, \exists x$ {ACT(x) & BEC DEAD(y)}
         ii. 'Itziar has killed herself.' λx {ACT(x) & BEC DEAD(x)}
         iii. 'Itziar has died.' λy BEC DEAD(y)[7]

Thus, the lack of an overt device necessarily produces ambiguity, which has to be resolved by the respective context.

3.3 On the decomposition of transitive verbs

As we have seen above, transitive verbs derived from intransitive ones (or from intransitive adjectives) can be decomposed into at least two predicates, one that characterizes the higher argument (the subject), and another that characterizes the lower argument (the object). The question is whether a similar decomposition is also possible for basic transitives. There are indeed two classes of verbs where this seems feasible, the production and the annihilation verbs. Production verbs denote an event in which something comes into existence, while annihilation verbs denote an event in which something vanishes. Thus, 'bake a cake' could be analyzed that a cake comes into existence by the activity of baking, and 'eat a cake' – that a cake disappears by the activity of eating. (The naive ontology involved in language does not necessarily conform to the law of mass preservation!) This proposal is represented in (25).

(25)   Production and annihilation verbs
      a. *bake*: $\lambda y\, \lambda x$ {BAKE(x) & BECOME EXIST(y)}
      b. *eat*: $\lambda y\, \lambda x$ {EAT(x) & BECOME NON-EXIST(y)}

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[7]   It is in dispute how this middle reading is derived (see Kaufmann 2004).

However, nothing in the grammatical behavior of these transitive verbs hinges upon such a decomposition; one could as well consider *bake* and *eat* to be non-decomposed. Moreover, there are many transitive verbs (such as *love, hit*) for which a decomposition doesn't make much sense. Therefore, for the time being, I assume that basic transitive predicates (such as LOVE, HIT) do exist. I find Kratzer's (1996) proposal that transitive verbs are basically intransitive and add an agent only by means of active voice not particularly illuminating (for more specific points, see Wunderlich 2001).

3.4 The active-inactive type of argument linking

The semantic classification of intransitive verbs can be transferred to transitive verbs, considering that the subject usually is the controller and the object the affectee. Various indigenous languages of the Americas have two sets of pronouns or pronominal affixes to be attached to the verb: items of one set are used to mark a 1st or 2nd person transitive subject, while items of the other set are used to mark a 1st or 2nd person object. (The 3rd person usually is unmarked, except in the plural.) If it comes marking the only argument of an intransitive verb, items of both sets can be used, depending on whether it is more similar to the subject or to the object of a transitive verb. These markers can neither be said to be accusative nor to be ergative because there is a clear split in the intransitives and the definition given in (6) of section 2 fails. Therefore, this type of argument linking is assumed to reflect the active or inactive status of an argument rather than its position in the argument hierarchy.[8]

For illustration, (26) represents the full set of personal affixes of Dakota, a group of Siouan dialects spoken in North and South Dakota as well as in other regions in the US and Canada. The prefixes for the 1st and 2nd person show the relevant distinction, whereas no distinction is made in the dual 'I and you (sg)'. There are three further affixes: *wic^{h}a-*, which is only used for animate 3pl objects (and therefore can truly be classified as accusative), *-pi*, which is separated from person and encodes plural, and the portmanteau prefix *c^{h}i-* to be used for the special communicative situation 1→2.

(26)   Personal affixes of Dakota (Schwartz 1979)

	active [+act]	inactive [−act]	accusative [+hr]
1	wa-	ma-	-
2	ya-	ni-	-
1dl.incl	ũ(k)-		-
3pl.anim	-	-	wic^{h}a-

-pi : Plural [+pl]
c^{h}i- : Portmanteau 1→2

The use of these affixes is demonstrated in (27) to (29). It should become clear from these examples that the prefix *ma-* '1' can mark the subject of an intransitive verb, the patient (object) of a transitive verb, and the recipient of a ditransitive verb. One can conclude that *ma-* encodes the inactive status of the 1st person rather than its semantic role (as patient or recipient) or its grammatical function (as subject or object).

(27)   Intransitive verbs in Dakota
        a. wa-niwa   'I swim'   wa-niwa-pi   'we swim'   (Active)
        b. ma-t'a   'I die'   ma-t'a-pi   'we die'   (Inactive)

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[8]   Actually, one needs more evidence for the conclusion that one is dealing with the active type. Choctaw, a Muskogean language of Oklahoma and Mississippi, has a similar split in the intransitives. Nevertheless, the markers on the Choctaw verb are classified as accusative (applied to inactive intransitives) and nominative (applied to active intransitives) because there exists a third set of markers, namely dative (Davies 1986). Dakota and the other languages subsumed under the active type do not have such a third set of markers. For the time being, I assume that the accusative-marked intransitives of Choctaw are lexically marked (see section 5 and footnote 13 below).

(28)   Transitive verbs in Dakota
        a. wa-kte 'I killed him'   wic^ha-wa-kte 'I killed them'   (Active)
        b. ma-kte 'he killed me'   ma-kte-pi 'they killed me'/'he killed us' (Inactive)
        c. ma-ya-kte 'you killed me'   c^hi-kte 'I killed you'   (Mixed)

(29)   Ditransitive verbs in Dakota
        a. wa-k'u 'I gave it to him'   wic^ha-wa-k'u 'I gave it to them'   (Active)
        b. ma-k'u 'he gave it to me'   ma-k'u-pi 'they gave it to me'/'he gave it to us'
                                                                                          (Inactive)
        c. ma-ya-k'u 'you gave it to me'   c^hi-k'u 'I gave it to you'   (Mixed)

As one can see from these examples, the argument role of a 1st or 2nd person is always made explicit; thus, the main task of an argument linking device is fulfilled. (The role of a 3rd person singular, however, must be specified by additional syntactic nominals.)

    One clear disadvantage of this type of argument linking is the necessity of classifying intransitive verbs according to their semantic properties. What are the exact conditions under which a verb is classified into the active class? For a number of active type languages, Mithun (1991) investigated the semantic factors for the active/non-active classification of intransitive verbs. Some of her results are summarized in (30): active ([+act]) is the marked option for dynamic verbs in Guaraní (a Tupi-Guarani language spoken in Argentina, Bolivia and Paraguay), for verbs with a participant which instigates the situation denoted by the verb (Lakhota) or controls it (Caddo in Western Oklahoma), or for an inherently imperfective verb with an agent argument in a broad sense (Mohawk, an Iroquoian language of Canada). Only in Central Pomo (which belongs to the Pomoan family), [+affected] of human beings (corresponding to [−act]) is the marked option. The complementary class always contains all other verbs (including the borderline cases), and is thus the default class. Inherently stative verbs are [−act] in Guaraní, Lakhota, Caddo and Mohawk, but [−aff] (corresponding to [+act]) in Central Pomo.

(30)   a. Guaraní: dynamic [+act]   vs. stative [−act]
        b. Lakhota: instigator [+act]   vs. non-instigator [−act]
        c. Caddo: controller [+act]   vs. non-controller [−act]
        d. Mohawk: agent & non-perfect [+act] vs. non-agent or perfect [−act]
        e. Central Pomo: patient [+aff]   vs. non-patient [−aff]

This variation demonstrates the difficulty of supporting a split required for grammatical reasons by a semantic partition. As a reaction to this problem the intransitive split is often lexicalized in the course of historical development, so that the decision becomes independent of semantic factors. This is observed for Cherokee (an Iroquoin language) by Scancarelli (1987). (Similar observations have been made for the choice of *sein* 'be' as the perfect auxiliary in German, which is often lexicalized.)

    On the other hand, a semantic split allows us to distinguish between the possible readings of an intransitive verb, as shown in (31) for Lakhota. In quite a similar way the choice of the German perfect auxiliary sometimes distinguishes between possible readings of a verb, as shown for the same semantic contrast in (32).

(31)   Different semantic readings for an intransitive verb in Lakhota
        (Foley & van Valin 1984:96)
        a. wí   cexélka   b. há: cexélka
            1sg.INACT   slip/slide   1sg.ACT   slip/slide
            'I'm slipping.'   'I'm sliding.'

(32)   Different semantic readings for an intransitive verb in German
        a. Er ist gerutscht.   b. Er hat gerutscht.
            he is slipped/slid   he has slipped/slid
            'He was slipping.'   'He was sliding.'

Furthermore, if the feature [+act] (or conversely, [+aff]) is semantically interpreted, it becomes possible to mark exceptions from canonical transitive verbs. For instance, transitive experiencer verbs of Lakhota can be marked by means of double-inactive, as shown in (33).

(33)   Double-inactive in Lakhota (Mithun 1991)
        i-ni-ma-ta
        ?-2.INACT-1.INACT-PROUD
        'I am proud of you'

For Central Pomo not only double-inactive verbs (34a) but also double-active verbs are reported; with regard to the latter one has to assume that no participant is affected (34b).

(34)   Double-inactive and double-active in Central Pomo (Mithun 1991)
        a. to=wa   mto   ˀyáqan?
           1.INACT=Q   2.INACT   remember
           'Do you remember me?'
        b. mul   ˀa   ˀyáq-an-ka-w cʰó-w.
           3.ACT   1.ACT   remember-IMPF-CAUS-PERF not-PERF
           'I couldn't think of him.'

These observations suggest that the semantic reading of an active vs. inactive marker is the relevant factor. However, Central Pomo also allows a person-related split in the class of emotional verbs where the 1st person (higher in its person status) is always marked as affected (i.e. inactive), regardless of whether this person is the source or the target of emotion (35a,b).

(35)   Person-related split in Central Pomo (Mithun 1991)
        a. Mul   qadála   to   ˀúdaw.
           3.ACT hate=IMMEDIATE   1.INACT   really
           'I [+aff] really hate him [−aff]'
        b. To   qadál-m-ad=a   mul.
           1.INACT   hate-NON.EMPATHETIC-IMPF=IMMEDIATE 3.ACT
           'He [−aff] hates me [+aff]'

Clearly, a 3rd person could as much get affected as a 1st person. It seems therefore more appropriate to consider the hierarchy active > inactive as a purely grammatical scale which can be associated with any arbitrary semantic scale, so that something like the person-related split of Central Pomo might have evolved.

     This conclusion is supported by the observation that the 'different subject' (DS) marking of Lakhota not only reflects differences in the reference to persons but also in their active/inactive status. (36a) illustrates coordination by means of the 'same subject' marker -y; here, one and the same person is active in both events. In (36b) the DS marker -qan encodes that two different persons are involved, whereas in (36c) it encodes that a single person is involved in two different activity states.

(36)   Coordination in Lakhota (Foley & Van Valin 1984: 119)
        a. Há: káluhu-y   si:má:mérqaki:hi.
           1sg.ACT   go-home-SS   went.to.bed
           'I went home and then went to bed.'
        b. Há: káluhu-qan   mí:p   mérqaki:hi.
           1sg.ACT   go-home-DS   3sg.ACT   went.to.bed
           'I went home and he went to bed.'
        c. Há: xá: qákki-qan wi   qa:lál tá:la.
           1sg.ACT   water bathe-DS 1sg.INACT sick   become
           'I took a bath and got sick.'

4. Further argument linking types in transitive verbs

In this chapter, I introduce more basic types of argument linking. The inverse type (section 4.1) encodes whether the subject or the object is higher on a person scale than the respective other argument; that is, two independent scales are aligned, which makes it possible that in principle only one set of person affixes is needed. In contrast, in the salience type (section 4.2) several sets of person affixes are used, one for each semantic or grammatical role if it is the most salient; this type exhibits certain similarities with the voice type, and therefore I put them together. In the positional type (section 4.3) syntactic positions are grammaticalized for encoding argument roles, and no person affixes are needed. Finally, by far the most widespread is the generalized case type (section 4.4), which comprises several varieties of accusative and ergative marking systems.

Implicit in the distinction of these types is the claim that they can neither be reduced to each other nor regarded as subtypes of a more comprehensive or abstract type. Only the positional type could in some sense be related to the accusative type. The salience and voice types, which are still poorly defined, could turn out as subclasses of a single type or as a collection of several distinct types. Presently no one can make a survey which is close to being complete.

4.1 The inverse type

The inverse type is best-known from the Algonquian languages, which stretch from Labrador south into present North Carolina and west across the Plains into Alberta and Montana; Plains Cree, the language with which we will illustrate this type, belongs to a group of Canadian dialects stretching westwards. Most remarkable for Algonquian is the way in which the roles of subject and object are encoded in the class of transitive animate (TA) verbs in which both arguments are animate. Consider (37a) with the reading 'we see the dog', and (37b) with the inverted reading 'the dog sees us': this difference is triggered by the theme (or voice) markers that directly follow the stem, whereas the person-number morphemes are not altered. /-ā/ is called a 'direct' morpheme (triggering that the higher person is subject), and /-ikw/ is called an 'inverse' morpheme (where the higher person is object). In contrast, transitive inanimate stems (TI) do not undergo such an alternation because an inanimate entity cannot become subject of 'see', see (37c).

(37)   Transitive verbs in Plains Cree (Wolfart 1973,
        Wolfart & Carroll 1981, Dahlstrom 1991, Fabri 1996)
        a. Ni-wāp-am-ā-nān   atim.
            1- see-TA-DIR-1pl   dog
            'We see the dog.'
        b. Ni-wāp-am-iko-nān   atim.
            1- see-TA-INV-1pl   dog
            'The dog sees us.'
        c. Ni-wāp-aht-ē-naan.
            1-see-TI-LOC.PERS-1pl
            'We see it.'

A first observation concerns the central role of animacy. Plains Cree classifies transitive verbs according to whether the object is animate or inanimate by means of derivational suffixes. Similarly, intransitive verbs are classified according to whether their subject is animate (IA) or inanimate (II). (38) shows some derived stems of Ojibwe (a related Algonquian language), which are based on the adjectival root *biin* 'clean'.

(38)   Some derived stems in Ojibwe (Valentine 2001)

	animate	inanimate	
Intransitives: the subject is ...	biin-zi (IA)	biin-ad (II)	'be clean'
Transitives: the object is ...	biin-ih (TA)	biin-toon (TI)	'make clean'

These four classes of verbs are differently inflected insofar as only animates can be 1st or 2nd person. There is only one set of person-number affixes available, and these affixes always fill the same positions. The TA verbs therefore need a further device for determining whether an affix relates to subject or object.

The inflected TA verbs show a strong person hierarchy at work. In the prefixes, 2nd person has preference over 1st person, as attested by the examples in (39) in which 1st and 2nd person are combined (1st inclusive person refers to 'I and you'); furthermore, both local persons (1st and 2nd) have\ preference over 3rd person. This suggests the scale 2 > 1 > 3.

(39)　Preference of 2nd person in Plains Cree
　　　a.　Ki-tasam-i-n.　　　b.　Ki-tasam-iti-n.
　　　　　2-feed-DIR-1　　　　　2-feed-INV-1
　　　　　'You feed me.'　　　　'I feed you.'
　　　c.　Ki-tasam-i-nān.　　d.　Ki-tasam-iti-nān.　e.　Ki-tasam-ā-naw.
　　　　　2-feed-DIR-1pl　　　　2-feed-INV-1pl　　　　2-feed-DIR-1.incl
　　　　　'You(sg/pl) feed us.'　'We feed you(sg/pl).'　'We_incl feed him.'

In the suffixes, however, plural of the 1st person is preferred over plural of the 2nd person (pl/1 > pl/2), as shown by (39c,d).

In addition, all 3rd person arguments must be ranked to each other. Only one proximate 3rd person (the foregrounded one) is possible in a certain stretch of discourse, all other 3rd persons must be obviative (sometimes called 4th person) and cannot be marked for plural. Obviative must be marked on nouns or noun phrases, so that one gets informed about the obviation status of each nominal referent. It is sufficient, however, to use only verb forms, and as the examples in (40) show, the theme markers indicate whether the proximate person is subject or object. The use of /-ē/ and /-ikw/ in (40) is consistent with the ranking 3 > obv.

(40)　Obviative in Plains Cree
　　　a.　wāpam-ē(w)-ak　　　　　b.　wāpam-ikw-ak
　　　　　see-DIR-3pl　　　　　　　　see-INV-3pl
　　　　　'They see him_obv.'　　　　'He_obv sees them.'

As has become evident, the grammatical function of the person-number morphemes in TA verbs wholly depends on the theme (voice) markers attached directly to the stem. The set of these markers in the independent mode (characterizing unembedded sentences) is represented in (41); all instances below the shaded diagonal encode direct constellations (where the subject is higher on the person scale than the object), whereas all instances above it encode inverse constellations (where the subject is lower than the object). The person hierarchy is extended here to 2 > 1 > 3 > obv > inanimate, thus including further variants of the 3rd person. It is never possible that subject and object have an equal person status; reflexives in which subject and object are identical are realized by intransitive verbs.

(41)　Theme markers in Plains Cree (independent forms)

O\S	2	1	3	obv	inanimate
2		-iti	-ikw		
1	-i				
3	-ā				
obv	-im-ā		-ē	more forms	
inanim	-ē				

To account for the function of the theme markers formally, one can introduce the feature [+hp] 'there is a higher person', which expresses relative salience analogously to the feature [+hr] 'there is higher role'. The theme marker then associates this feature with one of the argument roles. More precisely, a direct marker associates it with the lower role, and an inverse marker associates it with the higher role. This is shown in (42).

(42)   a. direct   b. inverse

              λy λx VERB(x,y)   λy λx VERB(x,y)

              +hr −hr   +hr −hr

     -ā: +hp   -ikw: +hp

              3   1   1   3

The last line indicates a possible distribution of person values. The direct voice is compatible with the 1st person assigned to the higher role (the subject), whereas the inverse voice requires the 1st person to be assigned to the lower role (the object).

    In principle it would be possible to have only one direct and one inverse marker. Actually, however, there are several markers. They can be represented as partly generalized portmanteau morphemes bearing information about both arguments, as shown in (43); only *-ikw* is a fully generalized inverse morpheme.

(43)   Theme markers

direct	-ā	1/2→3	+hp/+hr
	-i	2→1	+hp,+1/+hr
	-ē	3→obv	+hp,+obv/+hr
inverse	-ikw	INV	+hp/−hr
	-iti	1→2	+hp,+1/−hr

Indeed, theme markers (which classify verbs according to the semantic values of their arguments) may have been derived from former portmanteau morphemes, thereby regularizing the inflectional patterns. Dahlstrom (1988) reports that the conjunct (dependent) forms of Plains Cree underwent a rapid change during the second half of the 19th century. (The conjunct forms lack a person prefix, but instead have sometimes an initial conjunct marker, *ē-* or *kā-*.) Presently they exhibit the same theme markers as the independent forms (except some combinations with 1sg and 2sg, which lack a theme marker), but that was not always the case: they involved much more irregular portmanteaus in the 1855 translation of the Gospel according to St. John.

    The conjunct forms are interesting also for another point. Since they do not have a position for a person prefix, ambiguities would arise if only were the suffixes known from the independent forms available. The conjunct forms indeed exhibit more person-number suffixes, and some of them (in forms without a theme marker) are truly portmanteau morphemes, as illustrated in (44).

(44)   Singular conjunct forms in Plains Cree

      a. ē-wāpam-at   b. ē-wāpam-isk

        CONJ-see-2sg→3sg   CONJ-see-3sg→2sg

        'that you saw him'   'that he saw you'

In principle it is possible that portmanteau forms collapse, for instance, 3→2sg and 1→2sg could be expressed by the same suffix; such a suffix would have to be classified as 2sg.accusative. The sporadic emergence of accusative morphemes indeed has been observed, although not in Cree. But in the conjunct mood of Ojibwe (dialect of Manitoulin Island, Lake Huron) the two accusative morphemes *-i* (1.ACC) and *-inin* (2.ACC) have developed (Valentine 2001). These morphemes, interesting as they are, must nevertheless be judged as sporadic because similar morphemes have already been attributed to Proto-Algonquian by Goddard (1979). The system as a whole was and is robust enough to reject further generalization to accusative.

    As a whole, the morphology of the inverse type can be described as symmetric. In every use of a TA verb the two arguments must have a different person status so that the lexical asymmetry of transitive verbs is outbalanced by the person hierarchy. Disregarding the theme markers themselves, no asymmetry remains: each person-number affix can relate to either subject or object.

    If two nouns are expressed in a clause (such as 'man' and 'duck' in (45)), one must be marked as obviative. Together with the possibility of direct vs. inverse marking, this leads to four versions, illustrated in (45).

(45)   Four-way transitive alternation in Plains Cree (Wolfart 1981:30)
     a. wāpam-ēw nāpēw siisiip-a.
        see-DIR   man   duck-OBV
        'The man sees the duck (obv)'
     b. wāpam-ik   nāpēw siisiip-a.
        see-INV   man   duck-OBV
        'The duck (obv) sees the man' [≈'The man is seen by the duck']
     c. wāpam-ēw nāpēw-a siisiip.
        see-DIR   man-OBV duck
        'The duck sees the man (obv)'
     d. wāpam-ik   nāpēw-a siisiip.
        see-INV   man-OBV duck
        'The man (obv) sees the duck' [≈'The duck is seen by the man']

Although passive might be the best translation quivalent of the inverse construction, the latter would wrongly be classified as 'some kind of passive'. Besides the transitive inverse form, Cree has an impersonal passive, in which the TA stem is inflected intransitively, shown in (46).

(46)   wāpam-aw   nāpēw / siisiip.
        see-3   man / duck
        'The man/the duck was seen.'

Moreover, the inverse construction does not alter the syntactic status of the two arguments. This conclusion is forced by the observation that Plains Cree does not show any syntactic subject-object asymmetry of the kind known from English or other case-based languages (Dahlstrom 1991, Bailin & Grafstein 1991, Wunderlich 2005). English exhibits so-called weak cross-over effects: for instance, a subject can bind the possessor of the object (47a), while the object cannot bind the possessor of the subject (47b); the intended meaning of (47b) can only be expressed by the passive in (47c).

(47)   Weak cross-over effects in English
     a. $Anna_i$ loves her_i son.   /$Which_i$ woman loves her_i son?
     b. *Her_i son loves $Anna_i$. /*$Which_i$ woman does her_i son love?
     c. $Anna_i$ is loved by her_i son. /$Which_i$ woman is loved by her_i son?

No such restriction holds for Plains Cree. Not only can the subject bind the possessor of the object, but also the object can bind the possessor of the subject, as shown in (48b).[9]

(48)   No weak cross-over effects in Plains Cree (Dahlstrom 1991: 99)
     a. kahkiyaw   iskwēw-ak sākih-**ē**-w-ak   o-tānis-iwāw-a.
        all   woman-pl love-DIR-3-pl   3P-daughter-3plP-OBV
        'All $women_i$ love $their_i$ daughters.'
     b. kahkiyaw   iskwēw-ak sākih-**ik**-w-ak   o-tānis-iwāw-a.
        all   woman-pl love-INV-3-pl   3P-daughter-3plP-OBV
        '$Their_i$ daughters love all_i women.'
        [≈ All women are loved by their daughters.]

This binding property is independent of position. The sentences in (49) are positional variants of (48b) but get the same reading.

(49)   Different positions of quantifier and nouns (Dahlstrom 1991: 99,87).
     a. o-tānis-iwāw-a   sākih-**ik**-w-ak kahkiyaw   iskwēw-ak.
        3P-daughter-3plP-OBV love-INV-3-pl all   woman-pl
        '$Their_i$ daughters love all_i women.'

---

9   The possessor of a noun is considered to be more salient than the possessed; therefore, the possessed noun usually gets an obviative marking.

[≈ All women are loved by their daughters.]

b. kahkiyaw   sākih-**ik**-w-ak   o-tānis-iwāw-a   iskwēw-ak.

all   love-INV-3-pl   3P-daughter-3plP-OBV   woman-pl

'Their$_i$ daughters love all$_i$ women.'

[≈ All women are loved by their daughters.]

(49b) shows quantifier floating, with the quantifier in focus position before the verb. As Dahlstrom (1991) points out, quantifier floating in Plains Cree is only possible for object quantifiers – thus, 'all woman' is a true object.

There are of course no logical restrictions for weak cross-over. Both formulas in (50), representing the meanings of (48a,b), are sound.

(50)   a. $\forall x \, \forall y$ [WOMAN(x) & DAUGHTER.OF.x (y) $\rightarrow$ LOVE(x,y)]

b. $\forall x \, \forall y$ [WOMAN(x) & DAUGHTER.OF.x (y) $\rightarrow$ LOVE(y,x)]

Nevertheless, (50b) cannot be expressed by an English active sentence. English, like many other languages, has acquired a syntactic notion of 'subject' and 'object', which is lacking in Plains Cree. Unlike English, 'subject' in Plains Cree always refers to the highest argument; neither case nor position can help us to identify the subject; only the theme marker determines which argument functions as subject. Therefore, disregarding all superficial differences, it is correct to say that inverse morphology represents a type of argument linking of its own, it neutralizes subject-object asymmetry and is therefore incompatible with case. A change into a case system is improbable, even if sporadic generalization to accusative may occur. We are unable to see Plains Cree as a mere 'notational' variant of English.

Yet, inverse morphology is clearly a rare (typologically marked) option. It can emerge only under very specific circumstances, including head marking, a rigid classificatory system of verbs related to argument properties, a strong person hierarchy, and the existence of person-number morphemes unspecified for grammatical functions.

The major classification of verbs, being forced by the inverse morphology, is into transitive verbs that have an animate object and those that have not. Correspondingly, ditransitive verbs formed by various derivational means (causative, benefactive, comitative) are always classified as transitive animate (TA) in virtue of the fact that they add an animate argument. As we have seen, inverse morphology (which grammaticalizes person hierarchy) also forces the introduction of a fourth person (obviative) because no two arguments can have the same person status. This all together indicates a strong interaction between the emergence of certain verb classes and the structural means of identifying the arguments of a verb unambiguously.

4.2 The salience or voice type

In the active type (section 3.4) we found two sets of pronominal affixes (active and inactive), while the inverse type (section 4.1) exhibits only one set of pronominal affixes together with direct and inverse morphemes, and additional portmanteau morphemes that seem to undergo several changes. In contrast, the salience type exhibits several sets of pronominal affixes, together with the restriction that only one affix is possible at a verb – it encodes the most salient argument. This type is exemplified by Arizona Tewa, a Tanoan language spoken in a number of pueblos along the Rio Grande in New Mexico and Arizona.

(51)   Six sets of person prefixes in Arizona Tewa (Kroskrity 1985)

a.   STAT: encodes the argument of an intransitive verb

b.   REFL: identifies agent and patient of a transitive verb

c.   POSS: encodes a possessor related to the subject of an intransitive verb

d.   BEN: encodes a beneficiary argument of a transitive verb

e.   AGT: encodes the agent of a transitive verb

f.   PAT: encodes the patient of a transitive verb

STAT and REFL are unproblematic because intransitives and reflexive transitives (such as 'he washes (himself)') only have one argument to be realized. POSS adds an argument to an

intransitive verb (52a), while BEN adds an argument to a transitive verb (without any further marking of the verb) – these arguments count as the most salient ones because they mostly refer to a human person and are often in the focus of predication. AGT and PAT encode the person which is more salient, see (52b-f). 1st and 2nd person are more salient than the 3rd person, and 'these girls' in (52f) is more salient than 'those boys' because of the proximate-distal contrast. With a PAT marking, the respective less salient agent receives an oblique marking (52c,e,f), which resembles the obviative marking of Cree (see 4.1).

(52)   The one-prefix restriction of Arizona Tewa (Kroskrity 1985)
   a. semele **dín**-han
       pot   1sg.POSS-break
       'My pot broke'
   b. he'i-n   sen-en **dó**-k^{hw}ɛ́di
       this-pl man-pl 1sg.AGT-hit
       'I hit these men'
   c. he'i-n   sen-en-di   **dí**-k^{hw}ɛ́di
       this-pl man-pl-OBL 1sg.PAT-hit
       'These men hit me'
   d. Ne'i   kwiyó   ná:-tay
       this   woman   2sg.AGT-know
       'You know this woman'
   e.   Ne'i   kwiyó-di   wó:-tay
       this   woman-OBL 2sg.PAT-know
       'This woman knows you'
   f. nɛ́'i-n 'ayú-n 'o:'i-n 'enú-n-di **'ó:bé**- k^{hw}ɛ́di
       this-pl girl-pl that-pl boy-pl-OBL 3pl.PAT-hit
       'Those boys hit these girls'

The prefixes of the AGT set cannot be identified with active in the sense of the active type because they do not occur with intransitive verbs; likewise, the prefixes of the PAT set cannot be identified with inactive. Neither can the elements of PAT be identified with accusative (or the elements of AGT with ergative) because there is no contrast to nominative, which would be required on the basis of the definitions given in (6), section 2. In principle, however, it is imaginable that one of these markers develops to accusative or ergative. A more detailed comparative study of the Kiowa-Tanoan languages seems promising, given the interesting fact that Kiowa represents an extreme portmanteau type (see section 1), but Arizona Tewa the salience type, and that both Tiwa and Towa, the two other Tanoan branches, have an inverse marker (according to Klaiman 1993).

    Similar in its function, but much more systematic, is the so-called voice system of the Philippine languages, which we illustrate below with Tagalog. In this language, only one argument can be encoded on the verb: it is usually understood as definite and most prominent syntactically (for instance, only this argument can be relativized). The marked argument can be the agent (actor voice AV), the patient (object voice OV), a location or recipient (LV), a beneficiary (BV) or an instrument (IV); the three latter voices can add an argument without any further marking on the verb – thus they have the combined effect of applicative+passive (except that no argument is demoted). Some of these markers are also found with intransitive verbs, which shows that they are sensitive to semantic roles.

    The noun or noun phrase that corresponds to the designated (the most prominent) argument is marked by the proclitic *ang*, which could be identified with nominative (pronouns and proper names have a different marker). All other structural arguments are marked by *ng* (pronounced as /nang/), which is called genitive (but could as well be called accusative), while locatives and recipients are marked by *sa* (possibly to be analyzed as dative). Event nominalizations, as well as the recent past, lack any voice marking, therefore, no nominative *ang* can appear in them. The choice of the voice morphemes is often lexically determined.

All attempts to relate the Philippine voice system to either accusative or ergative have failed, and attempts to interpret the most prominent argument as topic or focus have failed, too. (There exists a different topic construction, and the tendency of being definite conflicts with the interpretation as focus.) What one finds are syntactic effects such as the possibility to get relativized. Similar systems are found in other Austronesian languages, too, partly reduced or reorganized. The name *voice* reminds us of active and passive, which also promote one of the arguments to the most prominent one. However, passive binds the agent existentially (it could only be expressed by an oblique adjunct, such as English (*He was seen*) *by the policeman*), while the corresponding object voice (OV) leaves the agent in a structural case. Moreover, a separate passive construction can coexist with the OV construction; Balinese, for instance, exhibits both (Arka 2003).

The examples in (53) illustrate the five voices of Tagalog with the verb *bili* 'buy'; it should become clear that the voices neatly correspond to the semantic roles of the participants of a buying event. Thus, the voice affixes classify verbs according to their potential of bearing certain semantic roles; they cannot be considered to be pronominal affixes because they do not bear any information about person and number.[10] (For phonological reasons, some of the prefixes surface as infixes; < > indicates such a prefix. In (53a), for example, /*um -*/ is infixed to the stem *bili*.)

(53)   Voices in Tagalog (Foley & Van Valin 1984:135)
   a. B<um>ili   ang=lalake ng=isda   ng=pera   sa=tindahan.
      <PERF.AV>buy NOM=man GEN=fish GEN=money LOC=store
      '*The man* bought fish in the store with money.'

   b. B<in>ili   ng=lalake ang=isda   ng=pera   sa=tindahan.
      <PERF.OV>buy GEN=man NOM=fish GEN=money LOC=store
      'The man bought *the fish* in the store with money.'

   c. B<in>ilh-an   ng=lalake ng=isda ng=pera   ang=tindahan.
      <PERF>buy-LV GEN=man GEN=fish GEN=money NOM=store
      'The man bought fish *in the store* with money.'

   d. I-b<in>ili   ng=lalake ng=isda   ang=bata.
      BV-<PERF>buy GEN=man GEN=fish   NOM=child
      'The man bought fish *for the child*.'

   e. Ip<in>an-bili   ng=lalake ng=isda ang=pera   sa=tindahan.
      <PERF> IV- buy GEN=man GEN=fish NOM=money LOC=store
      'The man bought fish in the store *with the money*.'

The person from whom one buys something is also marked by the location clitic *sa*; correspondingly, it is advanced to the most prominent argument by the location voice (LV), as shown in (54b).

(54)   Source in Tagalog (Foley & Van Valin 1984:63)
   a. B<um>ili   ng=isda   sa=bata   ang=lalake.
      <PERF.AV>-buy   GEN=fish   LOC=child NOM=man
      '*The man* bought some fish from the child.'

   b. B<in>ilh-an   ng=lalake ng=isda   ang=bata.
      <PERF>buy-LV GEN man   GEN fish   NOM child
      'The man bought some fish *from the child*.'

With the verb *bigay* 'give', the clitic *sa* marks the recipient as a goal (55a,b). The examples in (55) also illustrate how relativization functions in Tagalog: the recipient can be relativized in the location voice (LV; 55a), and the patient can be relativized in the object voice (OV; 55b), but the patient cannot be relativized if the verb shows actor voice (AV; 55c).

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10   If one assumes that the voice markers originated from affixes that make one of the arguments the referential argument of a derived noun (Ross 2002; Stiebels, this volume), one indeed wouldn't expect them to bear person-number information.

(55)   Relative clauses in Tagalog (Foley & Van Valin 1984:141)
    a. bata-ng   b<in>igy-an   ng=lalake ng=isda
        child-COMP   <PERF>give-LV   GEN=man   GEN= fish
        'the child which was given fish by the man'
    b. isda-ng   i-b<in>igay   ng=lalake sa=bata
        fish-COMP OV-<PERF>give   GEN=man   LOC=child
        'the fish which was given to the child by the man'
    c. *isda-ng   nag-bigay   ang=lalake sa=bata
        fish-COMP   PERF.AV-give   NOM=man   LOC=child

The common properties of voice systems seem to be the following: only one argument can be encoded on the verb, where the marker reflects the semantic role, and, possibly, the semantic value (person or definiteness) of this argument. However, unlike passive, no other argument gets demoted (which is particularly true for Tagalog). Arizona Tewa fuses voice with person-number, whereas Tagalog does not. In Tagalog, the argument that is encoded on the verb achieves a special grammatical status, i.e., functions as syntactic 'pivot'. Regrettably, the information about Arizona Tewa is too poor for evaluating whether the designated argument gets a similar syntactic function. It is therefore not yet possible to describe the general profile of the voice type more precisely. It might turn out in the end that Arizona Tewa and Tagalog belong to different types.

4.3 The positional type

The positional type is found in various languages, particularly in English, Chinese, West African and Oceanic languages, but also in other parts of the world, and it is often combined with some residual agreement. Recall that the default ordering of arguments usually follows the argument hierarchy, with the highest argument in the first position and the lowest argument in the last position (independently of where the verb is positioned). It is this default ordering that is fixed in the positional type.

Argument position can also depend on the information status of arguments. Topics, which express something which has already been given in the context, are mostly realized initially, sometimes followed by the focus element, which expresses the new thing – but there are many means to express focus differently, whereas topics usually are preferred in the first position.

Under the condition that arguments should be recognizable even if of one of them is topicalized, the order SVO turns out to be the most robust type. If the object is topicalized, one gets the order O_TSV, which clearly differs from SVO because two nominal arguments precede the verb. Thus, the roles of S and O can always be distinguished, as illustrated in the Chinese example (56).

(56)   SVO and object topicalization in Chinese
    a. wo kan-le   shu le.
        I read-ASP book ASP
        'I read books.'
    b. shu,   wo kan-le.
        book   I read-ASP
        'The book(s), I read.'

The SOV type (verb-final) would yield the ordering O_TSV as well, which, however, produces ambiguity because the first nominal could be S or O. Therefore, SOV type languages usually use morphological case rather than position to distinguish S and O. The verb-initial languages often have VOS as the basic order, but in this case no clear distinction is possible between O_TVS and S_TVO; one can only recognize that one of the arguments is topicalized but doesn't know which one; ambiguity is thus unavoidable. It is therefore reasonable that the positional type is restricted to SVO languages. The subject is realized pre-verbally, and the object in the position that immediately follows the verb; this position can be considered a variant of accusative marking.

The SVO type has a further advantage: one can form series of predications with a shared subject such as $S(V_1 O_1)(V_2 O_2)$ ... – such a series is called a serial verb construction SVC (see section 6.3). One of the verbs of an SVC can be grammaticalized for a specific function. As Peyraube (1996) points out, already the earliest Chinese inscriptions (more than 3,000 years old) have SVO together with SVOV+complement and fixed elements ('prepositions') that appear in either the first or the second V-position. Modern Chinese shows constructions such as those in (57): S *ba* $O_1 V O_2$, and SVO_1 *gei* O_2. Here, *ba* (in one of its several functions) marks a possessor of O2, and *gei* (formerly 'give') marks a goal. ('CL' stands for classifier.)

(57)   *ba* and *gei* in Chinese (Sybesma 1999:137,105)
  a. Li Si   ba Lao Li   duan-le   tui.
      Li Si   BA Lao Li   break-ASP leg
      'Li Si broke Lao Li's legs.'
  b. Zhang San song   yi-ben shu   gei Li Si.
      Zhang San give   one-CL book   to Li Si
      'Zhang San gave a book to Li Si.'

Obviously, the main verb in both (57a) and (57b) has three arguments. We will see in section 6.3 that the serial verb construction is one of the possible ways to express a third argument in the positional type. Another way is the double object construction to be discussed in section 6.4; it is also found in Chinese (58a). The observation that *gei* 'to' can optionally appear in this construction (58b) and also occurs in the *ba*-variant (58c) leads Sybesma (1999) to the conclusion that all realizations of Chinese *song* 'give' go back to an underlying change of location (rather than a change of possession) structure (see also sections 6.1 and 6.6).

(58)   Further variants of expressing 'give' in Chinese (Sybesma 1999:100ff., 136)
  a. Zhang San song Li Si yi-ben shu.
      Zhang San give Li Si one-CL book
      'Zhang San gave Li Si a book.'
  b. Zhang San song gei Li Si yi-ben shu.
  c. Zhang San ba zhei-ben shu song gei Li Si.
      Zhang San BA this-CL book give to Li Si
      'Zhang San gave this book to Li Si.'

These examples indicate that the SVO type can pave the way to more complex constructions, including the possibility of introducing prepositions for the marking of arguments. It is even conceivable that such a preposition develops to a case marker. Chinese *ba* seems to function as an accusative marker in some instances (such as (59a)), while in other instances (59b,c) it is not so clear whether this is true.

(59)   *ba* as a possible accusative marker in Chinese (Sybesma 1999:137ff.)
  a. Ta ba zhu mai-le.
      he BA pig sell-ASP   'He sold the pigs.'
  b. Ta ba huaping cha-le   yi-ba   hua.
      he BA vase   stick-ASP one-CL^{bunch} flower
      'He stuck a handful of flowers into the vase.'
  c. Ba ge zei   pao-le.
      BA CL thief escape-ASP
      'A thief escaped.'/ 'They had a thief escape.'

4.4 The generalized case type

Let us finally turn to the most frequent type of argument linking, which is so wide-spread that many linguists take it to be *the* universal type. In any case, it is central for all theories about argument structure. In systems of this type the fundamental lexical asymmetry of transitive verbs is preserved in the morphology and syntax.

In section 2 I introduced the notions 'accusative' and 'ergative': a marker is called 'accusative' if it encodes objects (patients) differently from agents and intransitive subjects; it is called

'ergative' if it encodes transitive subjects (agents) differently from objects and intransitive subjects. Both 'accusative' and 'ergative' are contrasted with 'nominative'. I also introduced the two features [+hr] and [+lr] that encode the argument hierarchy and, simultaneously, characterize the two alternatives: accusative marks [+hr] argument roles, and ergative marks [+lr] argument roles, whereas nominative (bearing no feature specification) is compatible with any argument role. Furthermore, I argued that marking the lower role is preferred over marking the higher role, which results in the preference scale +hr > +lr (for convenience: ACC > ERG).

An argument linking system that conforms to these conditions is called a 'generalized case' system. It can be accusative-based, ergative-based, or both (i.e., a mixed system). Moreover, there can be different ways to spell out the accusative or ergative property: The verb can be combined with pronominal affixes or agreement morphemes that belong to an ACC or ERG set (*head-marking*), or the nominal arguments (pronouns or full NPs) themselves are combined with particles (adpositions) or morphological case (*dependent-marking*). The notion of generalized case thus includes both the flagging of the verb and the flagging of syntactic complements (where 'flagging' can be done by certain kinds of affixes, clitics or particles). It is even possible to subsume the positional SVO type under generalized case: the position to the right of the verb is reserved for objects; it can thus be characterized as accusative (bearing the feature [+hr]).

Head- vs. dependent-marking

In the types discussed in the preceding sections (the active type, the inverse type, and the salience type, but not in the Philippine voice type), the arguments are marked on the verb by means of pronominal affixes; such a mechanism is called *head-marking*. There can be two sets of pronominal affixes (active and inactive), only one set of pronominal affixes (in the inverse type), or several sets (in the salience type). In section 4.1 we found that portmanteau morphemes can be generalized to accusative; in principle, also inactive affixes or elements of the PAT set of Arizona Tewa could develop to accusative – all these instances lead to an accusative head-marking. Head-marking is one of the major characteristics of languages with 'rich' morphology (Nichols 1986, 1992). Pronominal affixes can further develop to pure agreement markers; the verb then needs to be complemented by free syntactic elements that instantiate person and number values the verb agrees with.

In contrast, dependent-marking usually does not emerge within sets of pronominal elements, but rather from elements that are attached to a noun phrase in order to specify its argument role. In section 4.3, I argued that Chinese *ba* could be regarded as being in the process of becoming an accusative marker. Similarly, a topic marker could get reanalyzed as an accusative morpheme. There are various ways in which systems with morphological case may have developed.

In principle, head-marking and dependent-marking emerge independently of each other. One finds languages with both kinds of marking, languages that have only one of them, and languages with no marking (except by position), see (60). Basque exhibits ergative, dative and nominative, both on the auxiliary verb and on free nominals. Yimas (a language of New Guinea) exhibits ergative, accusative, dative and nominative sets of pronominal affixes, but has no case marker on nouns. Japanese shows accusative, dative and nominative postpositions with nouns, but no agreement morphemes on the verb. Chinese, an 'isolating' language, represents the positional type SVO without agreement and case (except some tendency towards an accusative preposition). If both case and agreement are lacking, the language may nevertheless show 'rich' morphology; an example is the Siberian isolate Nivkh: the only way to mark an argument in Nivkh is incorporation of the lowest argument (see section 6.3 below).

(60)   *Head marking* and *dependent marking* are independent of each other

	with 'agreement'	without 'agreement'
with case	Basque (E, D, N)	Japanese (A, D, N)
without case	Yimas (E, A, D, N)	Chinese: isolating (SVO) Nivkh: polysynthetic (SOV)

Mixed accusative-ergative systems

Pure accusative systems are found in Indo-European and in many other families around the world. A pure ergative system is found in Basque as well as in many more languages, but more than often ergative occurs together with accusative. Such a system is called a mixed system.

Yimas (New Guinea) exhibits three sets of pronominal affixes in the 1st and 2nd person. As the examples in (61) show, *ŋa-* can properly be called an accusative morpheme and *ka-* an ergative morpheme because both contrast with *ama-*, used with intransitive verbs. However, the 3rd person lacks accusative. Since an inflected verb usually begins with a nominative form, accusative and ergative never cooccur with a transitive verb. A detailed analysis of the pronominal affix paradigms of Yimas is presented in Wunderlich (2001).

(61)   Accusative and ergative in Yimas (Foley 1991)
         a. ama-tmuk-t.   b. pu-ŋa-tpul.   c. pu-ka-tpul.   d. na-mpu-tpul.
            1sgN-fall-perf   3plN-1sgA-hit   3plN-1sgE-hit   3sgN-3plE-hit
            'I fell down.'   'They hit me.'   'I hit them.'   'They hit him.'

Accusative and ergative can, however, cooccur with transitive verbs of Dyirbal, a Pama-Nyungan language of Australia (Northeast Queensland). This language has morphological case, and again shows a split between local person (1st or 2nd) and 3rd person. Pronouns of local person are marked by accusative (*-na*), while demonstratives as well as full nouns are marked by ergative (*-ŋgu*).

(62)   The linker inventory of Dyirbal (incomplete; Dixon 1994:10/14)

		NOM	ACC	ERG
I	noun	∅	—	-ŋgu
	DEM: F.SG	balan	—	baŋgun
	DEM: M.SG	bayi	—	baŋgul
III	1PL 'we all'	ŋana	ŋana-na	—
	2PL 'you all'	ɲurra	ɲurra-na	—

The reader can easily verify that this kind of split allows four combinations, summarized in (63). ('loc' indicates 1st or 2nd person.)

(63)   Four possible case patterns in Dyirbal

Direct setting (loc/3)	Inverse setting (3/loc)
'We see the man.'	'The man sees us.'
NOM NOM	ERG ACC
Symmetric setting (loc/loc)	Symmetric setting (3/3)
'We see you.'	'The man sees him.'
NOM ACC	ERG NOM

In Udi, a Northeast Caucasian language, one finds these four case patterns, too, yet for slightly different reasons. As in Dyirbal, ergative pronouns are lacking in the 1st and 2nd person, and accusative is restricted to definite, animate or pronominal objects. The examples in (64) illustrate these possibilities. (The consonant t' which precedes the case ending is a stem augment. The subject marker on the verb is infixed to the verb stem *uk*.)

(64)   The four-way case split of Udi (Schulze 2001)
         a. ŝe-t'-in   s/um-ax   u<ne>k-sa.
            DIST-t'-ERG   bread-ACC   <3sgN>eat-PRES   '(S)he eats the bread.'
         b. ŝe-t'-in   s/um   u<ne>k-sa.
            DIST-t'-ERG   bread.NOM   <3sgN>eat-PRES   '(S)he eats bread.'

    c.   zu   s/um-ax   u<zu>k-sa.
         I.NOM bread-ACC <1sgN>eat-PRES   'I eat the bread.'
    d.   zu   s/um   u<zu>k-sa.
         I.NOM bread.NOM <1sgN>eat-PRES   'I eat bread.'

Also Hindi shows these four case patterns, but here the ergative is restricted to perfect, whereas accusative (similar to Udi) is found with human, specific animate or definite inanimate objects.

(65)   The four-way case split of Hindi (Mohanan 1994)
        a.   niinaa-ne   baalikaa-ko   uthaa-y-aa.
           Nina.F-ERG   girl-ACC   lift-PERF-M   'Nina lifted up a/the girl.'
        b.   niinaa   baalikaa-ko   uthaa-eg-ii.
           Nina.F.NOM   girl-ACC   lift-FUT-F   'Nina will lift up a/the girl.'
        c.   niinaa-ne   roTii   khaa-y-ii.
           Nina.F-ERG   bread.F.NOM eat-PERF-F   'Nina ate bread.'
        d.   niinaa   kelaa   khaa-eg-ii.
           Nina.F.NOM   banana.M.NOM eat-FUT-F   'Nina will eat a banana.'

The different case patterns thus signal not only what the subject and what the object is but moreover a certain distribution of values regarding animacy, definiteness, and aspect. Linguists observed surprisingly similar splits in unrelated languages from different parts of the world, a fact that calls for explanation. Aissen (1999) and, on a different theoretical background, Stiebels (2000, 2002) proposed to consider these similarities as resulting from the harmonic alignment of scales. I follow here Stiebels' proposal.

    A first scale concerns the morphological features of means selected for marking a certain property; cross-linguistically, accusative is more preferred than ergative (66a). A second scale concerns the interacting contextual features such as person, animacy, definiteness, or aspect; in each of these domains, the respective plus-valued feature is considered to be more salient than the minus-valued one, see (66b). These two scales are harmonically aligned if higher features are combined with higher features, and lower features with lower features, which yields, among others, acc/loc > acc/3 ('accusative is preferred for a local person') and erg/3 > erg/loc ('ergative is preferred for the 3rd person'). Finally, in accordance with the assumption that a grammar has to be restrictive, the reverse ranking is expressed as a markedness hierarchy, e.g. *ACC/3 » *ACC/loc ('accusative for the 3rd person is more strongly blocked than accusative for a local person'). This procedure yields a whole collection of markedness hierarchies, see (66c).

(66)   Harmonic alignment of morphological and semantic scales
        (Stiebels 2000, 2002)[11]
        a.   Morphological scale: +hr > +lr (for mnemotechnical ease: ACC > ERG)
           It is better to mark a lower argument (an object) than a higher argument (the subject).
        b.   Contextual semantic scales:
           person: loc > 3
           animacy: +anim > −anim
           definiteness: +def > −def
           aspect: +perf > −perf
        c.   Contextualized markedness hierarchies:
           *ERG/loc   » *ERG/3   *ACC/3   » *ACC/loc
           *ERG/+anim » *ERG/−anim   *ACC/−anim » *ACC/+anim
           *ERG/+def » *ERG/−def   *ACC/−def » *ACC/+def
           *ERG/+perf » *ERG/−perf   *ACC/−perf » *ACC/+perf

A split in the realization of ergative (accusative) results if the requirement MARK(ERG) (or MARK(ACC)) intervenes between the two markedness constraints, which could be done

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[11]   For convenience, I use the case names ERG and ACC rather than the respective features, which would be more adequate in the general framework.

differently in different scales. Each of the hierarchies in (66c) allows three options, as shown in (67).

(67)   a.   MARK(ACC) » *ACC/3 » *ACC/loc: All three persons have accusative.

        b.   *ACC/3 » MARK(ACC) » *ACC/loc: Only 1st and 2nd person have accusative.

        c.   *ACC/3 » *ACC/loc » MARK(ACC):   Accusative is absent.

The reader will realize that the collection in (66c) includes all the conditions that account for the splits reported above. For instance, *ERG/loc » MARK(ERG) » *ERG/3 is relevant for both Dyirbal and Udi (where ergative is restricted to the 3rd person), and *ACC/−def » MARK(ACC) » *ACC/+def is relevant for both Udi and Hindi (where accusative is ruled out for indefinite objects).

A split can also occur between two coexisting linking devices, as it happens in Warlpiri, a Pama-Nyungan language of the northern territory of Australia. Here, nouns show ergative case, but agreement is accusative-based: -rna '1sg' agrees with the subject of both intransitive and transitive verbs (68a-c), while -ju '1sg' agrees with the object (68d); consequently,   -ju has to be classified as accusative (A), and -rna as nominative (N).

(68)   Ergative case and accusative agreement in Warlpiri (Andrews 1985:106f.)
        a.   Ngaju   ka-rna   parnka-mi.
             I.NOM   PRES-1sg.N   run-NONPAST   'I am running.'
        b.   Ngajlu-rlu ka-rna   yankirri   wajilipi-nyi.
             I-ERG   PRES-1sg.N emu.NOM chase-NONPAST   'I am chasing an Emu.'
        c.   Ngajulu-rlu ka-rna-ngku   nyuntu   nya-nyi.
             1-ERG   PRES-1sg.N-2sg.A you.NOM see-NONPAST 'I see you.'
        d.   Ngaju   ka-npa-ju   nyuntulu-rlu   nya-nyi.
             1.nom   pres-2sg.N-1sg.A   you-erg   see-nonpast   You see me.'

Such a mixed system in which head-marking exhibits accusative and dependent-marking ergative is found in several languages, whereas the reverse constellation does not exist. This fact again follows from harmonic alignment. Since argument affixes on the verb are pronominal, one has to regard the scales given in (69a,b).

(69)   Harmonic alignment regarding pronouns and nouns

        a.   ACC > ERG (as above)
        b.   pro > N
             Pronouns are referentially more salient than nouns.
        c.   *(ACC/N) » *(ACC/pro)
             Accusative marking on nouns is more strongly blocked than that on pronouns.
        d.   *(ERG/pro) » *(ERG/N)
             Ergative marking on pronouns is more strongly blocked than that on nouns.

Sommarizing, the invention of a generalized case system has the advantage that it accounts for argument hierarchy purely structurally and at the same time allows the consideration of different semantic weights of arguments.

The emergence of dative
Many linguists consider dative to be a semantic or lexically-inherent case, which does not emerge under structural conditions. There is, however, overwhelming evidence that dative is a structural case: it often marks the medial argument of a ditransitive verb (the recipient of 'give', 'send' etc., or the causee of a causativized transitive verb), and can alternate with nominative; a dative argument can be coindexed with an agreement morpheme, and can be suppressed in certain constructions. On the basis of these diagnostics, Wunderlich (2002a) argued that dative is a structural case in Hungarian; similar arguments can be put forward for other languages, too. There are, of course, many languages that do not have a dative, and, as Eisenbeiß (2002) has shown, the acquisition of dative always follows the acquisition of accusative in an accusative-

based language like German. Dative can also appear in a pure ergative language such as Basque; and here the acquisition of dative follows that of ergative.

I claim that dative is a general option of a generalized case system, but whether it arises or not depends on historical circumstances. One advantage of having the two features [+hr] and [+lr] is the possibility of combining them and thereby characterizing the medial argument of a ditransitive verb; correspondingly, dative is defined by the feature combination [+hr,+lr].[12] Such a decompostion of dative also conforms to Dowty's (1991) observation that a dative argument accumulates properties of both proto-agent (being a controller) and proto-patient (being affected), and it makes at once clear that the existence of dative presupposes the existence of either accusative or ergative. (70) illustrates that dative can arise in an accusative- or an ergative-based system independently, but is certainly facilitated in a mixed system (in which the two features for marking case are already used). Dative cannot appear in a language of the inverse type.

(70)   Encoding argument roles and generalized case
        intransitives   transitives   ditransitives
        λx VERB(x) $\lambda y\ \lambda x$ VERB(x,y) $\lambda z\ \lambda y\ \lambda x$ VERB(x,y,z)
        −hr   +hr −hr   +hr +hr −hr
        −lr   −lr +lr   −lr +lr +lr
        NOM   ACC NOM   ACC DAT NOM
                               NOM ERG   NOM DAT ERG

We call the case patterns associated with the argument roles in (70) 'canonical' because they offer an optimal distinction by case. Such a canonical system is very effective and also robust enough to allow various aberrations ('noncanonical' patterns) in the marking of minor lexical classes.

5. The lexical marking of verbs

Many languages with generalized case, either head-marking or dependent-marking, use the respective features in establishing minor lexical classes, for instance, classes of noncanonical 'transitive' verbs. In section 3.4 we observed that an active type language allows double-inactive as well as double-active verbs, both deviating from a canonical transitive. Similarly, languages with generalized case can establish classes such as nominative-dative verbs, double-accusative verbs, ergative-marked intransitives, and so on. I consider these special classes to be marked lexically. The presence of a particular lexical feature is not totally idiosyncratic, one rather expects it to be (weakly) correlated with some semantic factor. For instance, ergative-marked intransitives of Hindi-Urdu are expected to be agentive rather than nonagentive. On the other hand, the semantic properties alone usually do not suffice to predict the membership in such a class. Often, the presence of lexical marking can only be motivated on historical grounds or by analogy. Paul (1919) cites many examples where a particular verb shifts between canonical case and lexically marked case several times in the history of German.

A positional system lacks the possibility of lexical case features. Verbs such as 'help', 'like' etc, which are lexically marked in Icelandic and German, are canonically transitive in English. A positional system thus clearly reduces the set of lexical classes. Similarly, the inverse type, where a semantic scale is aligned with argument hierarchy, does not allow lexical marking apart from inversetantum ('make someone thirsty/drunk/sick', 'give someone a headache' in Ojibwe) and less expected classifications of nouns (cars are animate). This does not exclude that semantic classes of verbs can be characterized by derivational means.

5.1 Two classes of lexically marked dative verbs

The existence of dative decomposed into the feature combination [+hr,+lr] allows the introduction of two subclasses in the set of 2-place verbs by means of lexical marking. The two classes

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are symmetric to each other: either the lower argument is exceptionally marked by [+lr], or the higher argument is exceptionally marked by [+hr]. Through adding the remaining inherent features one yields the combination [+hr,+lr] in both instances. These two types of noncanonical datives should be distinct semantically.

The first class is exemplified by the NOM-DAT verbs of German (such as *helfen* 'help', *folgen* 'follow', *danken* 'thank'). These verbs seem to invite the inference that the object is a controller on its own, i.e., behaves as an active being in the event denoted by the verb. Indeed, the verbs often have an animate object that is independently in action. (71b) illustrates this class of 'active object verbs'. Similar verbs are found in several languages, including the ergative language Basque, in which they compete with ERG-NOM verbs (Joppen & Wunderlich 1995).

(71)   NOM-DAT verbs in German
        a. Sie folgte ihm.
            She.NOM followed he.DAT   'She followed him.'
        b. λy λx FOLLOW(x,y)
            designated: **+lr**
            inherent: +lr
                            +hr   −hr
            case :   DAT   NOM

The second class is exemplified by the DAT-NOM verbs of German (such as *gefallen* 'like', *schmecken* 'taste, enjoy', *schmerzen* 'pain', *gehören* 'belong'). These verbs seem to invite the inference that the subject is affected, namely an experiencer rather than an agent. Indeed, many verbs of this class are experiencer verbs, and those verbs that alter between dative subject and accusative object (such as *schmecken* 'taste, enjoy') have a slightly more active reading with accusative (see (72)), which is expected from a semantic point of view. Yet, this class also includes verbs that do not have an experiencer subject (such as *gehören* 'belong'), and, on the other hand, many experiencer verbs (such as *fürchten* 'fear', *mögen* 'like') instead belong to the canonical transitives. This suggests that this class cannot be defined on semantic grounds. Such an ambivalence with regard to semantic factors is characteristic for all types of lexical marking.

(72)   Alternating DAT-NOM and NOM-ACC in German
        a. Mir   schmeckte der Braten/   ?der Thymian.
            I.DAT   enjoyed   the.NOM roast meat/ ?the thyme
        b. Ich   schmeckte den Thymian/ ?den Braten.
            I.NOM   tasted   the.ACC thyme/ ?the roast meat

How lexical marking functions in this class is illustrated in (73). The lower argument resists accusative because of the working of DEFAULT ('every clause displays the default linker nominative', Wunderlich 2003). On the surface, the shift from (72a) to (72b) seems to involve two features (appearing on two different arguments), but it can actually be described by the loss of just one lexical feature. Such a loss must have happened to English *like* historically, in view of the fact that cognate Icelandic *likar* 'like' still behaves as a DAT-NOM verb.

(73)   DAT-NOM verbs in German
        a. Ihm gefiel der Roman.
            he.DAT liked the.NOM novel 'He liked the novel.'
        b. λy λx LIKE(x,y)
            designated: **+hr**
            inherent: +hr
                            −lr   +lr
            case: NOM   DAT

Many languages have productive classes of experiencer DAT-NOM verbs (or ACC-NOM verbs if dative is lacking), in particular ergative languages – perhaps because the shift from ergative to dative affects only one argument.

Some languages also exhibit intransitive verbs with accusative marking; the lexical feature is again +hr ('being affected'), which yields accusative because an intransitive verb does not

have the inherent feature +lr. German examples are *mich friert* 'I am cold' and *mich fröstelt* 'I am shivering', both clearly experiencer verbs. In Choctaw, a Muskogean language of Oklahoma and Mississippi, all nonagentive intransitives (such a 'be hungry', 'sweat', 'be tall', 'be old') are marked accusative (Davies 1986), in contrast to agentive verbs, which canonically realize nominative.[13]
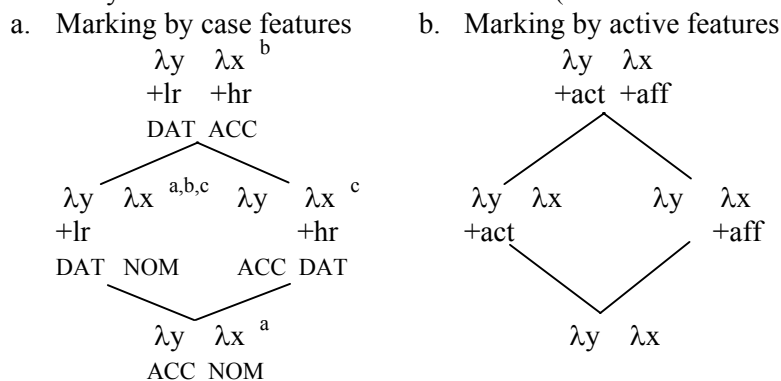
Choctaw also exhibits several transitive verbs that alternate between two case patterns regarding the pronominal (agreement) affixes on the verb. Some examples are given in (74).

(74)   Case pattern alternations in Choctaw
        a. NOM-ACC and NOM-DAT (Davies 1986: 110,112)   class[a]
            i. Chi-alikchi-li-tok.   ii. Chim-alikchi-li-tok.
                2A-doctor-1N-past   2D-doctor-1N-past   'I doctored you.'
            anoksita 'admire', *shilli* 'comb', *akammi* 'corral', ...
        b. NOM-DAT and ACC-DAT (Davies 1986: 128, 121)   class[b]
            i. Chi-nokkilli-li-h.   ii. Chi-sa-nokkilli-h.
                2D-hate-1N-pred   2D-1A-hate-pred   'I hate you.'
            komota 'fear', *nokpalli* 'desire', *noktalha* 'mistrust', ...
        c. NOM-DAT and DAT-ACC (Davies 1986: 112, 86)   class[c]
            i. Chim-ihaksi-li-tok.   ii. Chi-am-ihaksi-tok.
                2D-forget-1N-past   2A-1D-forget-past   'I forgot you.'
            lhakoffi 'miss', *ahchiba* 'tired of', *kania* 'lose', *achokma* 'like'

The lattice in (75a) shows the relationship between these lexical markings. The members in class[a] and class[b] alternate between the presence or absence of just one lexical feature, while the members in class[c] alternate between the presence of a lexical feature on either the lower or the higher argument. Of course, some further assumptions must be made about how the grammar of Choctaw deals with these lexical features. For instance, DEFAULT (which requires nominative in a domain) must be ranked lower than in German (where +hr on the higher argument leads to DAT-NOM rather than to DAT-ACC as in Choctaw). In a comparative study on lexical marking in Icelandic and German, Wunderlich (2003) accounts for all occurring case patterns on the basis of a few general constraints, which for Choctaw would have to be slightly reranked.

(75)   Lexically marked transitive verbs of Choctaw (for b see footnote 13)
        a. Marking by case features   b. Marking by active features
                    λy   λx [b]   λy   λx
                    +lr +hr   +act +aff
                    DAT ACC

            λy λx [a,b,c]   λy   λx [c]   λy λx   λy   λx
            +lr   +hr   +act   +aff
            DAT NOM   ACC DAT   +act   +aff

                    λy   λx [a]   λy   λx
                    ACC NOM

Interestingly, lexical marking in Choctaw only affects the morphology of verbs. Nouns (noun phrases) only show nominative or accusative (the latter called 'oblique' by Davies), so that all

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[13]   As mentioned in footnote 8, one could as well assume that Choctaw belongs to the active type. Nominative would have to be identified with [+active], and accusative with [+affected], in full correspondence with what the case features [+lr] and [+hr] suggest semantically. In that case, dative would have to be characterized as [+active, +affected]. The case pattern alternations shown in (74) could then be described by lexical assignments of [+act] and [+aff], so that one would get the lattice in (75b), which is isomorph to that in (75a). Thus, nothing forces us to classify Choctaw as belonging to the nominative-accusative or to the active-inactive type. Obviously, this language is at the border between the two types, and it illustrates how the more abstract generalized case type could have emerged.

the verbs shown in (74) realize their arguments syntactically in the canonical NOM-ACC pattern. This once again demonstrates that verb-external syntax is much more regularizing than verb-internal morphology.

5.2 Two classes of experiencer verbs with an expletive argument

Another, totally different type of lexical marking is mimicry. We say *it rains*, but cannot ask **what rains*? because RAIN is a zero-place predicate, which does not allow any nominal argument. Therefore, the *it* in *it rains* is called expletive; it fulfills a structural rather than a semantic condition on verbs in English. Here, a zero-place predicate mimics a structurally intransitive verb. Similarly, one-place predicates can mimic structurally transitive verbs. This is possible in two ways: either a higher or a lower argument role is added for purely structural reasons. German allows both options: a higher expletive is realized by *es* 'it', whereas a lower expletive is realized by a reflexive (+refl).

The first option yields impersonal verbs: the true argument is shifted to a lower role and thus receives accusative, as if there were a higher argument; this is demonstrated in (76b). This shift invites the inference that the argument is affected by some process, which is typical for experiencers.

(76)   Impersonal transitives in German
      a.   (weil)   es   ihn   ekelte
          (because) it   he.ACC disgusted   '(because) he was disgusted.'
      b. λy $\lambda \mathbf{x}$ BE_DISGUSTED(y)
        inherent: +hr −hr
                      es

The second option yields the so-called inherent reflexives (such as *sich erinnern* 'remember'): they have a fake object, which is necessarily bound to the subject. This again invites for an experiencer reading: one and the same argument is both agentive and affected.

(77)   Inherent reflexives in German
      a.   Er schämte sich.
          he.NOM was.ashamed himself   'He was ashamed.'
      b. $\lambda \mathbf{y}$ λx BE_ASHAMED(x)
        inherent: +hr −hr
              +refl

Some verbs allow both patterns without any shift in meaning, which shows that these patterns themselves do not contribute to compositional meaning.

(78)   Alternation between impersonals and inherent reflexives
      es ekelte ihn   er ekelte sich   'it made him sick'
      es freute ihn   er freute sich   'he was pleased'
      es wunderte ihn   er wunderte sich   'he was surprised'

German exhibits more patterns involving impersonals and inherent reflexives, including dative reflexives (*sich etw. aneignen* 'take possession of sth.', *sich etw. anmaßen* 'usurp sth.' *sich etw. verbitten* 'beg to decline sth.'). Consider the examples in (79).

(79)   Inherent dative reflexives in German
      a.   Ich   eignete   mir   das   an.
          I.NOM got.possession 1.DAT.REFL that.ACC   at
          'I took possession of that./ I acquired that.'
      b.   Ich   trank   mir   einen   an.
          I.NOM drunk   I.DAT.REFL INDEF.ACC at
          'I drunk too much.'
      c.   Ich   arbeitete   mir   einen   ab.
          I.NOM   worked   I.DAT.REFL INDEF.ACC off
          'I worked too much.' (Here, not only the reflexive but also *einen* is semantically empty.)

These examples exhibit the canonical NOM-DAT-ACC pattern. In general, the introduction of expletive arguments preserves the canonicality of case patterns, whereas lexical case marking introduces noncanonical case patterns. They are thus opposite options for marking special classes in the lexicon.

6. Ditransitive verbs: the emergence of a third argument

Every language needs a device to realize triadic predicates because even the most elementary transaction and communication events involve three participants: the giver, the recipient, and the given object, or the speaker, the addressee, and the uttered message. If such a device exists, it can easily be generalized to cover also the expression of more complex or derived three-participant events. In any case, the ditransitive option extends the grammatical potential of transitive verbs. It is the recipient or addressee who constitutes the third argument not found in a prototypical transitive verb.

The following survey will attest that it is not a simple step to go beyond the argument linking system developed for transitive verbs. Several variants of accounting for a third argument are imaginable, more conservative ones and more innovative ones. Either the issue of realizing a third argument is reduced to what can be done with transitive verbs, or the existing option for transitive verbs is slightly extended: a third position is introduced in a positional system, and a third case is introduced in a case system. In any case, how a third argument is integrated crucially depends on the particular linking type for transitive verbs.

In subsequent sections I will present three major typological variants (see also Sedlak 1975, Faltz 1978, Dryer 1986, and Haspelmath 2005). In the first, the number of syntactic arguments is nontrivially reduced by a serial verb construction or by noun incorporation; both options are innovative for human language in general, although they are nearly absent in the Indo-European family (section 6.3). In the second (perhaps the most conservative), the recipient is regarded as primary object and therefore treated like the object of a transitive verb (section 6.4). In the third, the recipient is treated differently from the object of a transitive verb, namely as the intended location or the intended possessor (section 6.5). The two latter alternatives also seem to underlie the English 'dative' alternation, which is discussed in section 6.6.

Before that, I will discuss the semantic decomposition of ditransitive verbs in section 6.1, and a few of the general constraints that help us to grasp ditransitive verb formation more theoretically (section 6.2).

6.1 How complex are ditransitive verbs semantically?

Why do we care about ditransitive verbs? On the one hand, speakers of an informed community must be able to express three-participant events of the kind one finds in transactions and communications. On the other hand, all argument linking types found in the languages around the world seem to have specialized on the basis of transitive verbs, and thus the question arises: how can a third argument be integrated?

From the semantic point of view the answer is relatively simple. An elementary three-participant event involves a transitive event directed to a goal. One gives (or says) something to an intended recipient; similarly, one puts something to an intended location. All ditransitive events include a transitive action with an intended result, which itself is stative. Essentially, two types of two-place stative predicates play a role: POSS(y,z) and LOC(z,AT(y)); something is in the possession of a person, or it is located at a certain place or object.

The combination of a transitive action with a two-place stative result is usually linked by a shared argument. If I sent a letter, and you received the letter, 'the letter' is the shared argument. Similarly, if I say "hallo", and you hear "hallo", this 'hallo' is shared in our minds. In order to integrate two predicates of this sort in just one (ditransitive) verb, the respective object must be the shared argument. What one has first to find out is how the third argument is integrated semantically, and, then, how it is expressed. The former problem concerns us in this section.

Two types of elementary ditransitive verbs

As already indicated, all verbs with three arguments are semantically complex, they can be decomposed into two predicates: one describing a certain activity and the other describing a certain result. Nearly every language exhibits some of these verbs in its primitive lexical repertoire (with no sign of morphological derivation). A closer inspection of these underived ditransitive verbs shows that they belong to two well-defined semantic classes: *change of possession* and *change of location* verbs. The former denote a transition into a state of possession (as defined by BECOME POSS), while the latter denote a transition into a state of location (as defined by BECOME LOC).

Typical change of possession verbs are *give*, *lend*, and *buy* (in general, 'give' verbs of any arbitrary language, and often also 'show' and 'ask'). The third argument of these verbs is typically a recipient, a human or animate being who comes into the possession of an object. The three participating semantic roles can be called agent (=x), recipient (=y) and theme (=z). (80b) shows possible semantic representations of these verbs.

(80)   Change of possession verbs
        a. Anna gave Max a book.
            Anna bought Max a book.
        b   *give*: $\lambda z\, \lambda y\, \lambda x\, \lambda e\, \{\text{ACT}(x)\ \&\ \text{BECOME POSS}(y,z)\}(e)$
            buy: $\lambda z\, \lambda y\, \lambda x\, \lambda e\, \{\text{BUY}(x,z)\ \&\ \text{BECOME POSS}(y,z)\}(e)$

Typical change of location verbs are *put*, *throw*, *push*, and *glue* (and many similar verbs in other languages). The third argument of these verbs is typically a goal, an object or a place where the theme becomes located. Many languages have developed locative prepositions or locative cases to encode location in combination with verbs. Thus, what we actually observe in the English examples in (81a) is a third syntactic argument in form of a directional prepositional phrase (PP), and the goal is an argument of the preposition rather than of the verb itself. We can speak of 'indirect linking' in such a case.

(81)   Change of location verbs
        a. Anna put the glasses behind the tree.
            Max threw the book behind the tree.
        b. *throw*: $\lambda P\, \lambda y\, \lambda x\, \lambda e\, \{\text{THROW}(x,y)\ \&\ P(y)\}(e)$
            behind the tree: $\lambda u\, (\text{BEC})\ \text{LOC}(u, \text{BEHIND*}\ \text{the.tree})$
            throw behind the tree: $\lambda y\, \lambda x\, \lambda e\, \{\text{THROW}(x,y)\ \&\ \text{BEC LOC}(y, \text{BEHIND*}\ \text{the.tree})\}(e)$

(81b) shows how such an indirect linking takes place. The first line states that ditransitive *throw* requires a predicative argument P, which can, for instance, be instantiated by the PP *behind the tree*. Semantically, this PP provides the predicate LOC specified for a BEHIND* region related to 'the tree'. The last line shows the full VP as a result of combining these two pieces of information.

The prepositional content often gets incorporated into the verb, as happens in the English word *enter*, a verb that can be decomposed into $\{\text{GO}(x)\ \&\ \text{BECOME LOC}(x, \text{IN}\ z))\}$. Verbs that undergo the so-called locative alternation quite systematically incorporate the predicate LOC into the verb. (82a) shows *paste/kleben* as a change of location verb in the format of (81), and (82b) shows the alternative in which LOC is incorporated, so that the goal becomes a direct argument of the verb. (For reasons that are discussed in section 6.2 below, the theme becomes oblique in this case.) Notice that German marks the alternation with the prefix *be-* on the verb, while English leaves it unmarked.

(82)   Locative alternation in English and German
        a. Anna pasted all her photos on the wall.
            Anna klebte alle ihre Photos an die Wand.
            glue: $\lambda P\, \lambda y\, \lambda x\, \lambda e\, \{\text{PASTE}(x,y)\ \&\ P(y)\}(e)$
        b. Anna pasted the whole wall with her photos.
            Anna beklebte die ganze Wand mit ihren Photos.
            glue: $\lambda z\, \lambda x\, \lambda e\, \exists y\, \{\text{PASTE}(x,y)\ \&\ \text{BEC LOC}(y,z)\}(e)$

Some verbs (such as German *schicken* 'send') denote an event in which change of possession and change of location cooccur; these verbs have both options.

(83)   Change of possession & location verbs
    a. Anna schickte dem Verleger   die Photos.
        Anna sent   the.DAT publisher the.ACC photos
    b. Anna schickte die Photos an den Verleger/ in die Bibliothek/ auf den Speicher.
        Anna sent the.ACC photos at the publisher/ into the library/ onto the store.
        'Anna sent the photos to the publisher/to the library/to the store.'
    (It is a peculiarity of English that only *to* is possible here, see section 6.6 below.)

If the added argument is human (or animate) the recipient construction is preferred, but if it is inanimate the goal construction is preferred. (§*Anna schickte dem Speicher die Photos* sounds odd.)

     The two classes of primitive ditransitives verbs, then, can schematically be summarized by the semantic representations in (84), with the proviso that LOC in (84b) could be provided by a prepositional argument.

(84)   Two classes of ditransitive verbs
    a. ACT(x) & BEC POSS(y,z)   y is a recipient – a medial argument
    b. ACT(x) & BEC LOC(z,AT(y))   y is a goal – the lowest argument

As before, ACT(x) is assumed to be an unspecific agentive predicate, which encodes that x does something intending a certain result. (Regarding the most unspecific verbs *give* and *put* one only knows that some transitive action is involved, but which kind of action depends on the context.) One could instead assume an unspecific manipulation predicate MANIP(x,z), which encodes that x does something concerning z, but that wouldn't change anything in the analysis because z must be a shared argument. However, verbs such as *buy* and *throw* involve a more specific manipulation predicate. In the result always a third argument is added, a recipient, a goal, or sometimes a source, as happens in 'steal'. *Jim stole his neighbour a knife* denotes an event where the neighbour possessed the knife in the beginning rather than in the end. Double object constructions of Chinese are even preferred with the source reading (Zhang 1998).

     That semantic decompositions such as those proposed in (84) are relevant becomes evident if one considers two of the major classes of denominal verbs: locatum vs. location verbs). The former class includes *to bridle/ zäumen, to saddle/satteln, to salt/salzen, to sugar/zuckern* (where the noun refers to some supplement or substance), whereas the latter class includes *to cellar/kellern, to store/speichern, to shoulder/schultern, to bottle, to box* (where the noun refers to a container or a supporting object).

(85)   Two major classes of denominal verbs
    a. Locatum verbs have the generalized reading {ACT(x) & BECOME POSS(y,z)}
    b. Location verbs have the generalized reading {ACT(x) & BECOME LOC(z,AT(y))}

How can the meaning of a denominal verb be determined? Following Kiparsky (1997) and Stiebels (1998) I assume that an abstract semantic template is chosen where the respective noun is integrated as the lowest argument. Thus, *to bridle the horse* gets the reading 'supply a horse with a bridle' (i.e., make the horse to have a bridle), whereas *to cellar the wine* gets the reading 'put the wine into a cellar' (i.e., make the wine to be located in a cellar). Which template is chosen partly depends on the prototypical reading of the noun, and partly on the argument structure used with the verb. This can be shown with a neologism I owe to Urbas (1990). If one is confronted with the statement *John matchboxed the crumbs*, one might come up with the reading that John collected the crumbs in a matchbox (because a container noun triggers the template of location verbs), whereas the intransitive clause *John matchboxed the whole time* suggests a different reading, for instance, that John produced matchboxes, and *John matchboxed the crumbs into a box* (where *matchbox* itself is a change of location verb) suggests an instrumental reading.

     The possibility of deriving a complex verb from a simple noun constitutes one of the major arguments for semantic decomposition. Without having access to semantic templates it would

remain mysterious why speakers can so productively (and also regularly) turn nouns into verbs. The templates used for the generation of denominal verbs probably derive from generalizations concerning semantic classes of simple verbs. Given that both types of denominal verbs cited in (85) are productive, it is clear that both change of possession and change of location are available options.

Derived ditransitives
There are various ways of supplying an ordinary transitive verb with a third argument. Such an argument extension operation can be marked morphologically (e.g., by an affix added to the verb), or it can remain unmarked. Typical derivations are the following:
- the causative adds a causer
- the applicative adds a beneficiary, a location, or an instrument
- the so-called possessor raising adds a possessor of the manipulated thing

German does not have morphological means to perform these derivations, except that a particle or prefix can do such a job in one of its semantic functions (e.g., *be-* in the locative alternation) (Stiebels 1996). Nevertheless, all three types of derivations can be found in German: a causative verb (86a), a benefactive dative (86b), and a possessor dative (86c). Schematic representations are given in (87).

(86) a. Sie ließ ihn einen Brief schreiben. 'She let him write a letter.'
      b. Sie kochte ihm eine Suppe. 'She cooked him a soup.'   (*alienable possession*)
      c. Sie verband ihm die Hand.
          She bandaged he.DAT the hand 'She bandaged his hand.' (*inalienable possession*)

(87) a. ACT(x) & WRITE(y,z)
      b. COOK(x,z) & BECOME POSS(y,z)
      c. BANDAGE(x,z) & POSS(y,z)

Since an extra argument must be licensed by some predicate, operations that add an argument are always incremental from the semantic perspective. The causative adds the higher predicate ACT(x), in which x is the causer (an agent), while the agent of the embedded verb (y) becomes a causee. (In the German verb complex *schreiben lassen* 'let write', the causee is realized by accusative.) The two other operations, illustrated in (86b-c), add POSS (or BECOME POSS); in such a case the extra argument (y) is the medial one. The main difference is that the beneficiary (86b) tends to be an alienable possessor (one who comes into possession), while the possessor (86c) is of course an inalienable possessor (the one the hand belongs to).

   Most grammatical systems treat these argument extensions in the same way as they treat the basic 'give' verb, probably on the basis of generalization. (For instance, the German sentences in (86b-c) display the same canonical ditransitive pattern NOM − DAT − ACC as *geben* 'give'.) However, whether the causative is involved in this generalization depends on how far the 'give' pattern is generalized. For instance, the causee of the Hungarian causative (88b) is differently realized from a recipient (88a). One can assume that the Hungarian causative morpheme imports instrumental case.

(88) 'Give' and causative in Hungarian
      a. Anna Péter-nek adott   egy könyv-et.
          Anna Peter-DAT gave   a book-ACC
          'Anna gave Peter a book.'
      b. Anna Péter-rel olvas-tat   egy könyv-et .
          Anna Peter-INST read-CAUS a book-ACC
          'Anna lets Peter read a book.'

The languages of the world differ widely in the way they add a higher argument (a 'new' subject) or a lower argument (a further object) to a transitive verb. Surveys on causative constructions are found in Comrie (1985) and Dixon (2000), among others. I will briefly illustrate two ways of adding a lower argument, in considering Indonesian and Tzotzil, a Mayan language of Mexico.

The formation of ditransitive verbs in Indonesian is very productive. Transitive verbs are used with a prepositional phrase (89), but can also be suffixed with -*kan* (an applicative morpheme); this results in a double object (DO) construction (90)(see also section 6.4 below). According to most of the object tests applied by Chung (1983), the first (i.e., the added) object behaves like the object of a transitive verb.

(89)   Transitive verbs with PP in Indonesian (Chung 1983)
      a.   mereka mem-bawa   daging itu [kepada dia]$_{PP}$.
          they   TRANS-bring meat   the to   him
          'They brought the meat to him.'
      b.   Ali mem-beli   telefisi   [untuk ibu-nja]$_{PP}$.
          Ali TRANS-buy television for   mother-his
          'Ali bought a televison for his mother.'

(90)   Ditransitive extension in Indonesian (Chung 1983)
      a.   mereka mem-bawa-kan   dia   daging itu.
          they   TRANS-bring-BEN him meat   the
          'They brought him the meat.'
      b.   Ali mem-beli-kan   ibu-nja   telefisi.
          Ali TRANS-buy-BEN   mother-his television
          'Ali bought his mother a televison.'

Unlike derived ditransitives, a few basic ditransitive verbs can be used in the DO construction without -*kan* (*beri* 'give', *kasih* 'give', *bajar* 'pay'), but curiously, -*kan* is used here to mark the prepositional construction optionally (that is, has an opposite function to that in (90)).

(91)   Alternation of 'give' in Indonesian (Chung 1983:234)
      a.   Ali beri   wanita itu surat.
          Ali give   woman the letter
          'Ali gave the woman a letter.'
      b.   Ali beri (-kan) surat   kepada wanita itu.
          Ali give-BEN letter   to   woman the
          'Ali gave a letter to the woman.'

Ditransitive verbs of Tzotzil (an ergative language) must be formed through *be*-suffixation applied to transitive verbs. The added argument, the recipient in (92a,b) and a possessor in (92c), is then marked by nominative agreement like the object of a transitive verb. Example (92c) shows that the (nominative) possessor on the verb agrees with the (ergative) possessor on the object (corresponding to German *er hielt mir meinen Kopf*).

(92)   Ditransitive extension in Tzotzil (Aissen 1987:106, 107, 126)
      a.   Ch-a-k-ak'-be.
          INCOMPL-2.NOM-1.ERG-give-DITRANS
          'I'll give it to you.'
      b.   'i-j-chon-be   chitom li Xune
          COMPL-(3.NOM)-1.ERG-sell-DITRANS pig   the Xun
          'I sold pigs to Xun.'
      c.   Ch-i-s-toyilan-be   j-jol.
          INCOMPL-1.NOM-3.ERG-keep.lifting-DITRANS 1.ERG-head
          'He kept lifting my head.'

In this language, 'give' is not a basic ditransitive but rather a transitive verb that has to undergo the applicative -*be*, which is generalized to cover also possessor raising. This observation nicely supports the assumption that recipients are a kind of possessors.

Sections 6.3 to 6.5 below address the question how a third argument is realized if a certain argument linking potential for transitive verbs is given. In languages that amply use local prepositions, the problem of realizing a third argument mainly reduces to the question how a recipient gets realized.

6.2   Some general constraints

Semantic composition by which two or more predicates are combined increases the generative power of a language. One therefore aims at restricting the possible combinations, so that the generative power remains delimited. (If everything were possible in a language, utterances would produce semantic noise rather than articulated speech.) More specifically, we are looking for a way to restrict the combinations of predicates in a verb or verb-like complex (such as verb-verb compound or serial verb construction).

In Lexical Decomposition Grammar (Wunderlich 1997a,b), the semantic form (SF) of a verb is intended to be a minimal semantic decomposition, i.e., the meaning of the verb is decomposed only as far as necessary for predicting the argument hierarchy and other structural factors. Perhaps it is never possible to specify the conceptual meaning of a verb completely, at least, this would not be the aim of linguists who are interested in the structural impact of decomposition.

In order to determine argument hierarchy, SF decompositions of verbs must be asymmetric. Logically (conceptually), A & B and B & A are equivalent, but as SF decompositions they are not. By convention, the first predicate in our representations is considered to be the higher one, so that A & B is actually [A [& B]].

According to various authors (Kaufmann 1995b, Kaufmann & Wunderlich 1998, Wunderlich 2000, Gamerschlag 2005), the SF of a simple or derived verb obeys at least the following constraints: the combination of predicates denotes a coherent situation (93a), a causal predicate precedes the result predicate (93b), and there is a referential chain between the components (93c).

(93)   a. COHERENCE. Subevents encoded by the predicates of a decomposed SF structure must be connected contemporaneously or causally/consequentially.

   b. ICONICITY. In a decomposed SF structure, cause precedes result, and consequences follow their instigation.

   c. CONNECTION. In a decomposed SF structure, each predicate must share at least one argument with another predicate, either explicitly or implicitly.

COHERENCE requires that the individual predicates in A & B either relate to the same time span or are connected by a causal/consequential relation. In the latter case, ICONICITY informs us about the function of the individual predicates: in A & B, B is the result of A, or B belongs to a set of consequences enabled by A. Because of such a strong requirement, ACT(x) & BECOME POSS(y,z) can only receive the interpretation that ACT(x) causes y to get into the possession of z because an ongoing activity and a transition (expressed by BECOME) can never be contemporaneous (at most they could overlap temporally). Therefore, a connecting predicate such as CAUSE need not be encoded explicitly.

Although serial verbs (see also 6.3) seem to form a syntactic construction, they nevertheless obey the condition of coherence. It has been unanimously pointed out by all researchers concerned with serial verbs that they denote just one coherent event, in contrast to a syntactic coordination, which denotes two independent events. For instance, a serial verb construction never allows an anaphoric pronoun (94a), while a coordination often requires it (94b). This suggests that serial verbs are a lexical complex in which the argument that separates the two verbs is infixed, similarly to a particle verb, in which the particle often is separated from the verb. (The examples are from Edo, a Benue-Congo language of Nigeria.)

(94)   Serial verb vs. coordination in Edo (Stewart 2001:60)

   a. Òzó   lé   èvbàré ré.
       Ozo   cook   food   eat   'Ozo cooked and ate food.'

   b. Òzó   lé   èvbàré rrí ókè.
       Ozo   cook   food   eat it   'Ozo cooked food and ate it.'

CONNEXION requires that at least some of the arguments of different predicates are identified with each other. Thus, COOK(x,z) & BECOME POSS(y,z) in (87b) above characterizes a possible verb (e.g., 'John cooks porridge for Anne'), whereas COOK(x,u) & BECOME POSS(y,z) does not.

('John cooks porridge and Anne gets a cake' could not be expressed by a single verb.)

An internal argument of a predicate that is followed by another predicate in SF cannot be realized structurally. For instance, in the resultative construction (95b) one cannot express the stuff that was drunk.

(95)   Strong resultatives in English (Kaufmann & Wunderlich 1998)
        a.   The guests drank all of the red wine.
        b.   The guests drank the wine cellar empty.
        c.   DRINK(x,u) & BECOME EMPTY(z)

The object u of DRINK becomes nonstructural if a resultative is added that predicates of a different argument than u. Wunderlich (1997a,b) proposed the constraint (96), which restricts the mapping of SF representations into morphosyntax.

(96)   STRUCTURAL ARGUMENT. An argument is structural only if it is either the lowest argu-
        ment or (each of its occurrences) L(exically)-commands the lowest argument.

        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.

With these preparations, we can establish the argument hierarchies for the two classes of ditransitive verbs outlined in (84), as well as for causativized transitives, in (97).

(97)   Argument hierarchy of ditransitive verbs
        a.   Change of possession: ACT(x) & BECOME POSS(y,z)
             argument hierarchy: x > y > z (agent > recipient > theme)
        b.   Change of location: ACT(x) & BECOME LOC(z,AT(y))
             argument hierarchy: x > z > y (agent > theme > goal)
        c.   Causativized transitives: ACT(x) & VERB(y,z)
             argument hierarchy: x > y > z (causer > causee > patient)

In these minimal representations it is sufficient to satisfy CONNEXION by implicit arguments: indeed, x would have to act on z in both (97a) and (97b), and on y in (97c).

In the remainder of this chapter I briefly survey the various constructions for realizing three arguments. Several of these constructions can coexist in a language. Some ditransitive verbs may follow one of the patterns, while other verbs follow another pattern, or a single verb may allow variation according to contextual circumstances. It is also possible that the pattern for dependent-marking (morphological case) differs from that for head-marking (e.g., agreement).

6.3 The number of syntactic arguments is reduced

In this section two constructional types are considered which avoid the introduction of any further means for dealing with three structural arguments: serial verb construction and noun incorporation. As Mattissen (this volume) points out, these two constructions largely determine what is known as the polysynthetic type of language.

Serial verb constructions
The serial verb construction (SVC) is found in many South-East Asian and West African languages, and in other regions of the world as well. It is not restricted to particular language families and also occurs in Creole languages, as well as in sign languages. The examples in (98) from Yoruba, a Benue-Congo language of Nigeria, illustrate an SVC encoding change of possession. The first verb is transitive and realizes subject and object positionally. The second verb with the meaning of 'give' shares these two arguments and adds a third one, a recipient. Literally, the construction means 'Baba took the gown and then *he* gave *it* to the chief', but it actually lacks anaphoric pronouns such as *he* and *it*. Such a construction is sometimes the only way to realize the ditransitive verb 'give'. Several tests show that an SVC denotes a single coherent event rather than the coordination of two independent events; it is thus more similar to a single compound verb than to a syntactic coordination.

(98)   Change of possession: serial verbs in Yoruba, left-headed (Baker 1991:80f)

    a. Bàbá   fi   èwù   fún   oba.

      Baba   take gown give chief

      'Baba gave the gown to the chief.'

    b. Ó   ra   isu   fún   mi.

      3sg buy yam give 1sg

      'He bought me a yam.'

Yoruba is an SVO positional type language, where the verb is to the left of a verb phrase. The SVC is then left-headed, too, i.e., the first verb is its head, and the shared object is realized right-adjacent to it. Although the two verbs are separated by the shared object, they function semantically as a compound. Most languages with SVCs belong to the SVO type, but Ijo, an Atlantic-Congo language, shows the rare case of an SVC based on the SOV pattern (99). Here, the head is to the right: the object precedes the verb, and the second verb constitutes the head of the SVC, as indicated by tense marking. The two verbs are again separated by a noun, but in this case by the recipient, which exclusively belongs to the second verb.

(99)   Change of possession: serial verbs in Ijo, right-headed (Williamson 1965:54)

    Erí   opúru-mo   àki   tobóú   pìri-mi

    3sg crab-DET.PL take boy   give-PAST

    'He gave the boy the crabs.'

The serial verb construction is able to express many more semantic relationships between two verbs (such as instrumental 'take a knife and cut the tree', consequential 'go to the market, buy a fish and cook (it)', or manner 'go around and search'). (100) shows an example of change of location in the SVO-type. Here, the first verb introduces agent and theme, which function as the shared object, while the second verb adds a goal. The goat in the example is the being that is pushed and thereby forced to fall into the hole.

(100)   Change of location: serial verbs in Edo, left-headed (Baker & Stewart 1999:20)

    Úyì   sùá   èwé   lá   ùvún.

    Uyi   push goat enter hole

    'Uyi pushed the goat into the hole.'

The serial verb construction has the advantage that it offers additional argument positions for a triadic predicate. This is obvious in examples where the same predicate concept or even the same verb is repeated. In Oaxaca Chontal, a Hokan language of Mexico, the two 'give' verbs are sligthly different (101), whereas Cantonese repeats the same verb in just one construction (102). In both examples the recipient is added by the second verb.

(101)   Double-give in Oaxaca Chontal (Sedlak 1975)

    kúpa   elmel^yu   páypa   liw'á.

    3sg.gave the.money 3sg.gave.to his.son

    'He gave the money to his son.'

(102)   Double-give in Cantonese (Sedlak 1975:146)

    ŋɔ   pei   ts'in   pei koey.

    1sg give   money give 3sg

    'I give money to him.'

If serial verbs are a means of realizing additional arguments, one expects that one of the verbs can become a marker for a specific type of argument. Interesting in this connection is that Mandarin Chinese has generalized markers in both verb positions. The alternation in (56) shows that 'give' in the second position marks a recipient, but if it is in the first position it marks a beneficiary,.

(103)   Alternation between recipient und beneficiary marking in Mandarin (Luo 1999:4)
    a.   Lisi   xie   xin   gei   wo.   (Recipient or goal)
              write letter give   1sg   Lisi wrote me a letter.
    b.   Lisi   gei   wo   xie   xin.   (Beneficiary)
              give   1sg   write letter   Lisi wrote a letter for me.

Noun incorporation

Another, totally different way of reducing the number of syntactic arguments is noun incorporation. A verb can integrate its lowest argument by lexical incorporation so that a more complex verb results whose valency is reduced by one: a transitive verb shifts to intransitive, and a ditransitive verb shifts to transitive. This makes it possible to account for all ditransitive verbs by the same grammatical means that are used in transitives. One such a language is Arizona Tewa (see also section 4.3 above). The example in (104) shows that the theme argument is incorporated, so that the PAT prefix can successfully refer to the recipient.

(104)   Ditransitive verbs in Arizona Tewa (Kroskrity 1985)
    na:'in   **dí**-k'ú:wá-mégí
    we   1.PAT-sheep-give
    'We were given sheep (by you or some third person).'

Yukatek Maya is another language with incorporation. The examples in (105) illustrate that in both change of possession and change of location first the respective theme is integrated by incorporation, and then the resulting verb undergoes applicative, which allows a further argument. This further argument is a recipient realized by a suffix in (105a), while it is a goal realized syntactically by a noun phrase in (105b).

(105)   Noun incorporation, followed by applicative, in Yukatek
    (Krämer & Wunderlich 1999: 466f)
    a.   taan=u   kon-lol   -t-ik-etš
         INCOMPL=3.ERG sell-flower -APPL-IMPF-2.NOM
         'He is selling flowers to you.'
    b.   h   b'in-etš   a   lam -k'ak'-t   le   kòl-o?
         COMPL go-2.NOM 2.ERG stick.into-fire-APPL DEF cornfield-DEM
         'You went to set fire to the cornfield.'

These examples show that, similarly to the serial verb construction, change of possession and change of location can be treated alike. Both require a third argument: the argument which is added by the second verb (of the SVC) or by applicative (after noun incorporation) is either a recipient or a goal. This is predicted by the templates given in (84a) and (84b).

    At first glance, the Siberian language Nivkh seems to constitute a counter-example to this prediction – surprisingly, the third argument is always incorporated into the verb, regardless of whether there is a change of possession, as in (106), or a change of location, as in (107). Under the assumption that only the lowest argument of a verb can be incorporated, one expects that a goal can be incorporated, like in (107), but not a recipient – because a recipient is not the lowest argument.

(106)   Change of possession in Nivkh (Mattissen 2001:158ff.)
    a.   əmək karandas   p'-oʁla-k'im-d.
         mother pencil   REFL-child-give-INDIC
         'The mother gave a pencil to her child.'
    b.   ñi   to   hə-ñivx-ar-d.
         1sg fish that-person-feed-INDIC
         'I am feeding fish to him/her.'

(107)   Change of location in Nivkh
    a. ñi seta   ŋir-t'i-d.
       1sg sugar   dish-put-INDIC   'I put the sugar into the cup.'
    b. ma   t'om-hupu-d.
       dried.fish   fat-dip-INDIC   'I dipped dried fish into fat.'

The only possible way to account for data such as those in (106) is to assume that recipients are treated as goals. More precisely, one has to assume that the dominant relation in Nivkh is LOC, even if other languages would prefer POSS. This assumption is compatible with the fact that Nivkh does not have any possession verb: in order to express simple possession (or lack of possession) existential verbs are used with locative case (108a). On can further observe that locations can generally be incorporated in Nivkh: (108b) shows an example of locative incorporation into a stative intransitive verb.

(108)   Possession verb and locative incorporation in Nivkh (Mattissen 2001)
    a. ñ-uin   hə-bityə   q'au-d.
       1sg-LOC   that-book   not.exist-INDIC
       'I do not have that book.'
    b. p'-rəu-oʁla   parta-ñv-d.
       REFL-teach-child   desk-sit(down)-INDIC
       'The pupil sits at a desk.'

The only relevant mechanism of indicating the role of an argument is noun incorporation in Nivkh, and in this respect the language is unique. There is a clear advantage of such a mechanism. Given that a verb denoting a change of possession has two animate arguments, it is wise to make a distinction between these two arguments. The solution of Nivkh is: if an animate argument is incorporated in a verb it must be a recipient or beneficiary; it cannot be an agent. One can regard noun incorporation as a separate argument linking type (Wunderlich 2002c).

    Let us finally see how causative and noun incorporation can interact. The causative adds an argument, and noun incorporation binds an argument. This can be done in either order, and even iteratively, as illustrated by examples from Alutor, a Chukotko-Kamchatkan language. (109a) shows that a normal transitive verb results if first the object of the underlying verb is incorporated and then causative applies (literally 'I made my wife meat-eat'). If causative applies first (109b), a ditransitive verb results, and since only two structural arguments are possible, one of the objects must be realized obliquely (here: the theme by instrumental case); subsequent incorporation then leaves the verb intransitive, and the agent is realized by nominative (literally 'I wife-fed with meat'). (Note that the information about the subject is repeated in the final slot of an intransitive verb. Causatives are formed with the prefix *n-* and a simultaneous suffix.)

(109)   Different orderings of causative and noun incorporation in Alutor
    (Koptjevskaja-Tamm & Muravjova 1993)
    a. gəm-nan   tə-nə-tərgə-**Ɂawəj**-at-ən   ŋavə
       I-ERG   1sg.S-CAUS-meat-**eat**-SUFF-3SG.O   wife.NOM
       'I fed my wife with meat.'
    b. gəmmə   tə-ŋavə-n-**awəj**-at-ək   tərg-a
       I.NOM   1sg.S-wife-CAUS-**eat**-SUFF-1sg.S   meat-INSTR
       'I fed my wife with meat.'

If causative is applied iteratively, noun incorporation can be repeated, too. (110) shows a derivation which starts with an intransitive verb ('dry') and finally ends in an intransitive verb (which of course is much more complex semantically). Interestingly, in each stage of the derivation, the number of structural arguments is either one or two, corresponding to the number of arguments that can be encoded on the verb.

(110)   Iterated causative and noun incorporation in Alutor
        (Koptjevskaja-Tamm & Muravjova 1993)
        gəmmə t-   akka- n-nalgə- n-**kuww**-at-avə-tk-ən
        I.NOM   1sg.S-son-CAUS-skin-CAUS-**dry**-SUFF-SUFF-PRES-1sg.S
        'I am making my son dry skins.'

6.4   The recipient is treated like the object of a transitive verb

In this section I consider various ways of encoding the recipient similarly to the object of a transitive verb. In a system based on animacy, the animate recipient counts as more prominent than an inanimate theme. It therefore can be marked by accusative like the transitive object, or conversely, the theme, corresponding to the transitive object, can be demoted by oblique marking. In the positional linking type, the recipient takes the verb-adjacent position like the transitive object. Several tests such as passive and object agreement show that the recipient then indeed occupies the grammatical role of transitive objects. Therefore this solution of the third-argument problem can best be characterized by the term 'primary object', introduced by Dryer (1986). His clarification is welcomed in order to avoid confusion caused by undifferentiated uses of the notions 'direct' and 'indirect' object.

Argument hierarchy is again the best background on which a useful notion of 'object' can be based. First one has to delimit the set of objects, which all are different from the highest argument (the subject) and therefore designated as +hr. Then, a *primary* object is defined as the highest object, whereas a *direct* object is defined as the lowest object. In this section we are concerned with the primary-object solution.

The recipient is the more salient object semantically

If animacy plays an essential role in a language one expects that the recipient is treated alongside with transitive objects, but that the theme argument (prototypically inanimate) remains unmarked. This indeed can be observed in languages of the active-inactive type, as well as in languages with inverse marking.

In section 3.4 regarding the active-inactive type we already saw that recipients are marked by inactive affixes on the Dakota verb (see (29)). Another example that illustrates this is (111).

(111)   Inactive recipient marking in Lakhota (Van Valin 1977:19)
        Bill wówapi   kin (miye) ma-k'u
        Bill book DEF   1sg   1sg.INACT-give
        'Bill gave me the book.'

In an inverse system (section 4.1), the grammatical role of animate arguments is determined by direct vs. inverse marking. Direct marking encodes the less salient person as object, whereas inverse marking shifts its role to subject. The two animate arguments involved are either agent/patient of a transitive verb or agent/recipient of a ditransitive verb. (112) shows a direct form of Fox (Algonquian), marking a 3pl recipient. Similarly, examples from Ojibwe (Algonquian) attest that the 1st person (the more salient one) is agent in the direct form (113a), but recipient in the inverse form (113b).

(112)   Recipient in Fox (Dahlstrom 1995:4)
        ne-mināw-aki ne-šisēh-aki   mēšomakini.
        1-give-3pl   1-uncle-pl   that(obv).which.I.shot
        'I gave my uncles the game which I killed.'

(113)   Recipient in Ojibwe (Dryer 1986: 812)
        a. n-gi:-mi:n-a: mzinhigan za:bdi:s.
           1-PAST-give-3.ANIM   book   John   'I gave John a book.'
        b. n-gi:-mi:n-ik-a: mzinhigan za:bdi:s.
           1-PAST-give-INV-3.ANIM book   John   'John gave me a book.'

Derived ditransitive verbs can add an animate causer, or companion, or beneficiary (114a-c), which all get preference. For instance, (115) illustrates that a 1st person beneficiary requires inverse marking.

(114)   Some derived ditransitives in Ojibwe (Valentine 2001:435, 463 ff.)
      a.   Causative   b.   Comitative
         baak-nam-oo-h   wiid-oopo-m
         open-TRANS.ANIM-epenth-CAUS   WITH-eat-WITH
         'get someone to open something'   'eat with someone'
      c.   Benefactive
         dkw-aabiit-maw
         short-stringlike.object-BEN
         'shorten something (stringlike) for someone'

(115)   Benefactive in Ojibwe (Valentine 2001:700)
      Aw kwe   n-dazht-amaa-g   n-babgiwyaan.
      that woman 1-make-BEN-INV   1P-shirt
      'That woman is making me a shirt.'

The recipient is marked by accusative

A case that marks the object of a transitive verb is called 'accusative'. Khasi, a Mon-Khmer language of Assam, uses *ya* for this purpose (116a). With a ditransitive verb, the accusative marker *ya* however switches to the third argument (the beneficiary, i.e., the person who profits from the action of teaching), while the original object remains unmarked (116b).

(116)   Accusative marking in Khasi (Dryer 1986:816)
      a.   Ɂuu hiikay [ya   ka ktien phareŋ].
         he   teach ACC   the language English   'He teaches English.'
      b.   Ɂuu hiikay [ya   ŋa]   ka ktien phareŋ.
         he   teach ACC 1sg   the language English   'He teaches me English.

In the West Tibetan language Kham, a 3rd person subject is ergative-marked, and an animate object is accusative-marked, while an inanimate object remains unmarked (117a,b); furthermore, the verb agrees with a 1st person object (117c). Now, turning to a ditransitive verb, exactly these options are combined: the 1st person recipient is marked like the corresponding patient, and the (inanimate) theme argument remains unmarked (117d). Ditransitive verbs thus show the case pattern ERG-ACC-NOM, which is typical for a mixed ergative-accusative language lacking dative.

(117)   Accusative-marking and object agreement in Kham (Dryer 1986:817)
      a.   nga: zihm   nga-jxy-ke   'I built a house.'   (inanimate object)
         1sg   house 1sg-build-PAST
      b.   no-e   ka:h-lay   poh-ke-o.   'He beat the dog.' (animate object)
         3sg-ERG   dog-ACC   beat-PAST-3sg
      c.   no-e   nga-lay   cyu:-na-ke-o.
         3sg-ERG   1sg-ACC   watch-1sg-PAST-3sg
         'He watched me.'
      d.   no-e   nga-lay   bxhtanji   ya-n-ke-o.
         3sg-ERG   1sg-ACC   potato   give-1sg-PAST-3sg
         'He gave me a potato.'

Another possibility for ditransitive verbs is double accusative, which one finds in Yaqui, a Uto-Aztecan language of Mexico (118a). The passive data given in (118b,c) reveal that the recipient behaves as the primary object under passivization.

(118)   Double accusative and passive in Yaqui (Van Valin 2002:20)
      a.   Joan   Peo-ta   Ɂuka   vaci-ta   miika-k.
         Juan   Pedro-ACC DET.ACC   corn-ACC   give-PERF
         'Juan gave Pedro the corn.'

     b. Peo   ʔuka   vaci-ta   miik-wa-k.
        Pedro DET.ACC   corn-ACC   give-PASS-PERF
        'Pedro was given the corn.'
     c. *Uʔu   vaci   Peo-ta   miik-wa-k.
        DET.NOM corn   Pedro-ACC give-PASS-PERF
        'The corn was given to Pedro.'

Moreover, a ditransitive verb can be causativized, which then yields three accusatives in series (119a). Again, only the highest object (which in this case is the causee) can become nominative under passive (119b).

(119)   Triple accusative and passive in Yaqui (Van Valin 2002:20)
     a. Uʔu   maejto usi-ta   mansana-ta yoem-ta miik-tua-k.
        DET.NOM teacher child-ACC apple-ACC man-ACC give-CAUS-PERF
        'The teacher made the child give the man the apple.'
     b. Uʔu   usi mansana-ta   yoem-ta   miik-tua-wa-k.
        DET.NOM child apple-ACC   man-ACC   give-CAUS-PASS-PERF
        'The child was made to give the man the apple.'

Yindjibarndi, a Pama-Nyungan language of Australia, behaves similarly: The two objects of a ditransitive verb are realized by double accusative (120a), but only the recipient can become nominative under passive (120b,c).

(120)   Double accusative and passive in Yindjibarndi (Dryer 1986:829)
     a. Ngaarta   yungku-nha ngayu   murla-yi.
        man   give-past   1sg.ACC   meat-ACC
        A man gave me the meat.
     b. Ngayi   yungku-nguli-nha murla-yi ngaarta-lu.
        1sg.NOM give-PASS-PAST   meat-ACC man-INST
        I was given the meat by a man.
     c. *Murla   yungku-nguli-nha ngayu   ngaarta-lu.
        meat   give-PASS-PAST   1sg.ACC   man-INST
        The meat was given to me by a man.

The Theme is marked obliquely
Another way to treat recipients as primary objects is to mark the theme argument. In Tahitian, a Polynesian language with the basic word order VSO, the theme of a ditransitive verb is marked by the preposition *ʔi*, while the recipient remains the unmarked object (121).

(121)   Tahitian (Sedlak 1975: 153)
     ʔua   horoʔa a:tu   vau   [ʔi te hoːʔe taoʔa] ʔiaːna.
     PAST give   away 1sg   OBL the one present 3sg
     'I gave him the present.'

The recipient is the primary object in a double object construction
Languages with positional SVO marking use a double object construction SVO$_1$O$_2$ for ditransitive verbs, in which O$_1$ counts as the primary object, and O$_2$ as the secondary object. As a rule, the primary object O$_1$ is the more prominent one: it is affected by passive (i.e., becomes S), can be relativized or topicalized, or can be co-indexed with an object affix. Languages with this property, among others, are Chinese, Vietnamese, the Oceanic and the Bantu languages, as well as most of the creoles.

    For English we know two alternative constructions with ditransitive verbs, one is the double object (DO) construction, in which the recipient is the primary object, and the other is the prepositional object (PO) construction, in which the theme is the primary object, while the recipient (goal) is marked by the preposition *to*. As predicted by the above-mentioned rule, only the object adjacent to the verb (the primary object) is affected by passive, and it is preferred for relativization and topicalization, as shown in (80a,b).

(122)   Alternating ditransitive constructions of English
    a. He gave the woman a book.   (*double object*: DO)
        Passive: The woman was given a book.
        Relative clause: The woman he gave a book is over there.
        Topicalization: The woman, he gave a book.
    b. He gave the book to the woman.   (*prepositional object*: PO)
        Passive: The book was given to the woman.
        Relative clause: The book he gave to the woman is over there.
        Topicalization: The book, he gave to the woman.

The same is true for many other languages. As, however, Bresnan & Moshi (1990) have pointed out, apart from Bantu languages with asymmetric objects (Kikuyu, Chicheŵa, Swahili) there exist also Bantu languages with symmetric objects (Sesotho, Kichaga, Kinyarwanda, Marathi). In the asymmetric object languages only the primary object is affected by passive or can be marked by object agreement, while in the symmetric object languages both objects can be affected. (By definition, there can be no SVO_1O_2 marking language in which the secondary object becomes subject under passive while the primary object does not.) Moreover, the possibility of a secondary object to become affected is mostly controlled by further semantic factors for avoiding ambiguity.

    Indeed, in a language with strict symmetric objects (both being animate) a certain amount of ambiguity is unavoidable. (123) shows for Sesotho of South Africa that the patient and the beneficiary (the latter introduced by the applicative operation) can appear in either order, which invites for two interpretations. In the passive, illustrated in (124), each of the two objects can become subject, which again produces ambiguity, i.e., both (124a) and (124b) have two interpretations. Thus, Sesotho is one of the rare languages that have no clear grammatical mechanism for distinguishing between a second and a third argument. One expects, however, that the speakers will avoid these ambiguities by contextual cues, or by encoding different information structures (topic, focus).

(123)   Symmetric objects in Sesotho, inviting for two interpretations (Lee 2000)

        Sello   o-shap-el-a   Lineo bashanyana. / bashanyana Lineo.
        Sello   I.SBJ-beat-APPL-FV   Lineo boys
        i.   'Sello beats the boys for Lineo.'
        ii. 'Sello beats Lineo for the boys.'

(124)   Symmetric passive in Sesotho, inviting for two interpretations (Lee 2000)
    a. Morena   ó-bítsel-íts-o-é   baná.
        chief   I.SBJ-call-APPL-PASS-PAST   children
    b. Baná   ba-bítsel-íts-o-é   morena.
        children   II.SBJ-call-APPL-PASS-PAST   chief
        i.   'The children benefitted from having the chief called.'
        ii. 'The chief benefitted from having the children called.'

In contrast, asymmetric object languages make a clear distinction between primary and secondary object. The beneficiary object of Kikuyu (introduced by the applicative operation) must be verb-adjacent, thus, the reading of (125a) crucially differs from that of (125b).

(125)   Asymmetric objects in Kikuyu (Lee 2000)
    a. Karioki   ɔ:n-ɛ-irɛ   gari dereba.
        Karioki   SBJ.find-APPL-PAST   car driver
        'Karioki found a driver for the car.'
    b. Karioki   ɔ:n-ɛ-irɛ   dereba gari.
        Karioki   SBJ.find-APPL-PAST   driver car
        'Karioki found a car for the driver.'

However, if it comes to the passive, alternating passive is possible, provided that the semantic role of the participants can be inferred from the meaning of the verb. In (126) it is clear that the flower is given to the teacher because it would be bizarre to give a teacher to a flower.

(126)   Alternating passive in Kikuyu (Lee 2000)
   a. Moarimo ne   a-hɛ-ir-uɔ   ihoa   ne mo:do.
       teacher FOC   SBJ-give-PAST-PASS   flower by man
       'The teacher was given the flower by the man.'
   b. Ihoa   ne   re-hɛ-ir-uɔ   moarimo   ne mo:do.
       flower FOC   SBJ-give-PAST-PASS   teacher   by man
       'The flower was given to the teacher by the man.'

As one can observe, the positional linking of Bantu is supported by subject agreement, and, under special circumstances, also by object agreement. This could be the reason why these languages admit so much structural variation under the influence of topic and focus. In the symmetric languages it is even possible that SVO switches with OVS, see the possible readings of (124). More precisely, we are probably dealing here with $S_T VO_F$ vs. $O_T VS_F$, where the topic is preverbal and the focus postverbal, regardless of what the subject and what the object is.

Can we account for primary objects in a more formal way? I think that a simple logical consideration can guide us. Recall from (70), section 4.4 above, that −hr characterizes the highest argument and −lr the lowest argument from two different perspectives (what is higher, or, what is lower?). This yields the representation in (127b) below, in which the medial argument is the most marked one (+hr,+lr); it is therefore called 'indirect' object according to a long tradition, based on case-marking languages such as Latin or Greek. This is a fine solution in the presence of generalized case, which is independent of linear ordering.

   Positional argument linking, however, uses linear ordering, which is always from left to right and makes a second perspective from right to left dubious. Thus, the feature +lr seems unsuitable. The concept of linear ordering rather suggests something like the feature +hr to be applied iteratively. In a first step, all objects are assigned +hr, while the highest argument remains −hr. In a second step, all lower objects are assigned +ho ('there is a higher object'), and the highest object remains −ho. (127a) shows how this procedure yields the intended result. The lowest object comes out to be the most marked one (+hr,+ho), so that the medial argument can truly be characterized as the primary object. Notice that most grammatical constructions affecting objects pick out the least-marked object, be it the primary or the direct one.

(127)   Encoding primary vs. indirect object
   a   λz   λy   λx {ACT(x) & BECOME POSS(y,z)}
       +hr   +hr   −hr
       +ho   −ho
       secondary   primary
       object   object
   b. λz   λy   λx {ACT(x) & BECOME POSS(y,z)}
       +hr   +hr   −hr
       −lr   +lr   +lr
       direct   indirect
       object   object

There can be only these two ways of encoding a hierarchy, so that a fourth or fifth argument would not alter the typology based on the choice between +ho and +lr as the second feature. Usually speakers do not like too much complexity, even if it is grammatically possible. However, constructions with four structural arguments have been tested by researchers, see example (119) above, and also chapter 6 of Joppen-Hellwig (2001).

   Given this more precise concept of primary object, how can we integrate the various observations made in this section? In a Bantu language with symmetric objects, the feature +ho is ignored, so that both objects are undistinguishably +hr. In a language with double or even

triple accusative such as Yaqui (118) (119), the feature value –ho is decisive to single out the highest object. A language in which the theme is obliquely marked as in Tahitian (121), obviously is compatible with this account because the lowest argument is most marked. Differently is Khasi (116), which picks out the highest object to be marked by accusative: either because it is more animate or because it is judged as the indirect object – that can only be decided by further inspection.

If, however, the language has ergative (+lr), the feature +lr must be present. Therefore, the ERG-ACC-NOM pattern shown above for Kham (117) is not an instance of primary object marking in the sense of (127a), it rather follows from the role of animacy in this language. In terms of animacy, the recipient mostly outranks the theme. Therefore, the primary object status of recipients in active or inverse type languages follows from independent reasons. One could even speculate that animacy is the source for generalizing the structural notion of primary object. This conclusion makes the introduction of an indirect object, to be discussed in the next section, a puzzle. As we will see, there are at least two forces working against the primary object solution: the existence of ergative (and the kind of feature- marking it implies), and the fact that recipients are added to transitive verbs, and thus, intuitively, are the more marked objects.

6.5   The recipient is treated differently from the object of a transitive verb

This section deals with various solutions of the third-argument problem in which a special status of the third argument is accepted. It is either marked as the goal, or indirectly as the possessor of the theme, or by an extra case, the dative. The two latter solutions indeed justify the notion of indirect object. Every mechanism of realizing transitive verbs remains as before, but is augmented by an additional mechanism.

The recipient is marked as the goal by means of a preposition
A very common way is marking the recipient as the goal, i.e. by means of a local preposition. Such a device usually exists independently of ditransitive verbs, but can be generalized to cover also recipients. This is illustrated by an example from Tamazight, a Berber language, in (128). The same option is found in the English PO construction.

(128)   Goal-marking in Tamazight (Faltz 1978:77)
        i-ša   urgaz lešθaβ i   θmattutt
        3msg-give man   book to woman
        'The man gave the book to the woman.'

The recipient is marked as an alienable possessor of the theme
In contrast, the option in which the recipient is realized as the possessor of the theme is very rare cross-linguistically. It is found in Tongan, a Polynesian language, as a second option, which in this language, however, is not rare. The construction in (129b) literally means 'I give your food'; *ha'o* is an alienable possessor which syntactically belongs to the following noun.

(129)   Tongan: Alternation between goal and possessor marking
        (Broschart, Lambert p.c.)
        a. na'e   'oange   'e Pita   ha   tohi [kia Mele]PP.
           PAST   give.away ERG Peter ART.UNSPEC book   DIR Mary
           'Peter gave Mary a book.'
        b. 'oua mu'a ke   u   'oatu   [ha'o   me'atokoni]NP.
           wait first ERG 1sg give   2sg.POSS.AL   food.POLITE
           'Wait first before I give you some food.'

A similar 'recipient lowering' construction is discussed by Van Valin (2002) for Dyirbal, an Australian language. Dyirbal allows the alternation between dative (130a) (see also below), oblique (instrumental) marking of the theme (130b), and marking the recipient as the possessor of the theme (130c). Here, 'the woman gave the man's beans' exactly means what English

expresses by the sentence *the woman gave the beans to the man*. The endings on the demonstratives refer to the nominal class to which the following noun belongs (I, II, or III).

(130) Dyirbal (Van Valin 2002: 14, 22; Dixon 1972)
  a. Ba-la-m   miraɲ ba-ŋgu-n yugumbi-ru   wuga-n ba-gu-l   yara-gu.
     DEM-NOM-III beans DEM-ERG-II woman-ERG   give-TNS DEM-DAT-I **man-DAT**
     'The woman gave the beans to the man.'
  b. Ba-yi   yara wuga-n   ba-ŋgu-n dyugumbi-ru ba-ŋgu-m   miraɲ-dyu.
     DEM-NOM.I **man** give-TNS DEM-ERG-II woman-ERG DEM-INST-I beans-INST
     'The woman gave the man beans.'
  c. Ba-la-m   miraɲ ba-ŋgu-n dyugumbi-ru wuga-n ba-ŋgu-l   yara-ŋu.
     DEM-NOM-III beans DEM-ERG-II woman-ERG give-TNS DEM-INST-I **man-GEN**
     'The woman gave the man$_i$'s beans (to him$_i$).'

Conversely, it is also possible that the theme is marked as possessed by the recipient, provided that the language has a proprietive case, which however is rare and only found in some Australian languages, for example, in Kayardild. In (131), *nguki-wuru* has to be translated as 'having water', so that the construction literally means '(I) give it$_i$ to the men having water$_i$'.

(131) Kayardild (Australian, Van Valin 2002: 24)
  ...nguki-wuru wuu-ja   dangka-y.
    water-PROP give-ACT   person-MLOC
  '... [and I] will provide mankind with water'

At first glance, both constructions, the possessor marking of the recipient and the proprietive marking of the theme, support our analysis that recipients are intended possessors. It is not totally unexpected that the realization of a component of the verb is delegated to one of the arguments. The proprietive solution of Kayardild can best be compared with the delegation of LOC to an external PP, which we found in (81) above. The respective compositions are schematized in (132). The proprietive in this function is so rare because the proprietive itself is rare, compared to local prepositions.

(132) Composition with a delegated predicate
  a. PUT(x,z) & P(z) yields PUT(x,z) & BECOME LOC(z, AT y)
  b. GIVE(x,y) & P(y) yields GIVE(x,y) & BECOME POSS(y,z)   (or WITH(y,z))

However, such a composition is not possible for the possessor marking of the theme because the possessor is the higher argument of POSS, and the noun that bears the possessor is a sister argument of the recipient. We have to conclude that some inference must be made: 'A possessor of the theme can be identified with the intended possessor.' A possessor of an argument is often delegated to the verb (by the so-called possessor raising), which is the opposite of recipient lowering. Consider the following examples from Choctaw, a Muskogean language. Each of the verbs in (133) has four arguments; the dative that is nearer to the stem marks the recipient, and the other marks the possessor of the theme. (The word order of the syntactic arguments follows the argument hierarchy; only the subject is marked by nominative case, all other structural arguments can be left unmarked.)

(133) Possessor raising in Choctaw (Davies 1986:54)
  a. Hattak-at ohoyo iskali am-im-a:-tok.
     man-NOM woman money 1.DAT-3.DAT-give-PAST
     'The man gave my money to the woman.'
  b. Alla   towa chim-i-pila-li-tok.
     child   ball   2.DAT-3.DAT-throw-1.NOM-PAST
     'I threw your ball to the child.'

We have good reason to believe that possessor raising is a generalization enabled by the existence of a recipient dative (or accusative). On the other hand, possessors found on nouns are not readily generalized to cover also recipients as a sister argument of the noun. Summarizing, this option is not especially advantagous, in contrast to what we turn to now.

The recipient is realized by dative

The introduction of dative as a special case for the 'indirect object' is very common, not only in the Indo-European languages. The following two examples show that dative is compatible with both a pure accusative and a pure ergative system. Japanese is an accusative language of the SOV-type; all cases are marked by a postposition, and *ni* is a postposition that marks certain locative arguments but also the recipient of ditransitive verbs (134a), as well as the causee of a causativized transitive verb (134b). In contrast, Basque is an ergative language of the SOV-type; ergative and dative are marked by a suffix on the noun, and the final auxiliary agrees with all three arguments. Again, the recipient of a 'give' verb (135a) and the causee of a causativized transitive verb (135b) are encoded by dative.

(134)   Dative marking in Japanese
      a. otoka-ga   onna-ni   hon-o   age-ta.
         man-NOM woman-DAT   book-ACC give-PAST
         'The man gave the book to the woman.'
      b. John-ga   Mary-ni   sakana-o   tabe-sase-ta.
         John-NOM Mary-DAT fish-ACC   eat-CAUS-PAST
         'John let Mary eat the fish.'

(135)   Dative marking in Basque
      a. Ni-k   pobre-ei   diru-a   ema-ten   diet.
         1sg-ERG poor-pl.DAT money-DET give-IMPERF AUX.3N.3pD.1E
         'I give money to the poor.'
      b. Ama-k   haurr-a-ri   zopa   jan-araz-ten   dio.
         mother-ERG child-DET-DAT soup.DET eat-CAUS-IMPERF   AUX.3N.3D.3E
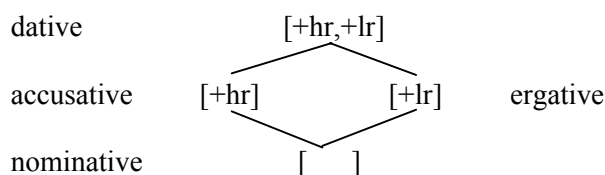   'The mother lets the child eat the soup.'

Dative is also possible in a pure head-marking language such as Yimas, a polysynthetic language of New Guinea that lacks morphological case. In Yimas, pronominal affixes are attached to the verb; they belong to different sets realizing the function of case. Dative affixes are restricted to 3rd person (136a), otherwise the recipient is marked by an accusative affix (136b). (The nominative affixes agree with the respective class of the noun, such as IV or VI.)

(136)   Alternation between dative and accusative marking in Yimas (Foley 1991)
      a. irpm   mu- ka- tkam-t   -nakn.
         coconut palm.IVsg   IVsg-1sgE-show-PERF-3sgD
         'I showed him a coconut palm.'
      b. uraŋ   k-   mpu- ŋa- tkam-t
         coconut.VIsg   VIsg-3plE-1sgA-show-PERF
         'They showed me the coconut.'

Many more languages display a canonical case pattern for ditransitive verbs, in the sense outlined above in (70) (section 4.4): NOM – DAT – ACC in accusative systems, and ERG – DAT – NOM in ergative systems. On the basis of the two features +hr and +lr, dative is indeed maximal; it is not possible to encode a fourth argument by a further structural case. In other words, the feature lattice for structural cases in (137), based on argument hierarchy, is complete.

(137)   Four possible structural cases

    dative   [+hr,+lr]

    accusative   [+hr]   [+lr]   ergative

    nominative   [   ]

The reader may ask about genitive: Isn't it a structural case, too? I consider genitive to be encoded like accusative but restricted to nouns; usually it marks the possessor of the noun (see

Stiebels this volume). Only if the genitive enters the verbal system in addition to accusative, it offers a special semantic reading, for instance, a partitive or a negative polarity reading. In languages such as Russian and Finnish, the genitive/partitive acquired many functions of the accusative, which could happen because the two cases bear the same feature +hr.

In the remainder of this section I first consider a case in which dative is just one option (Inuit), and then turn to two instances of dative-accusative syncretism, where dative and accusative have collapsed into one marker (Hindi and Georgian).

Alternative options for ditransitive verbs
At the beginning of section 6 I said that many languages have more than one option to express a third argument. One example is Dyirbal, demonstrated in (130). The two case patterns shown in (130a,b) are also found in Inuit (West Greenlandic), in which this alternation is subject to an interesting restriction. The basic ditransitive verbs of Inuit encode the recipient like the object of a transitive verb, and the theme argument is marked by instrumental (as in Dyirbal (130b)), see (138a). This seems to be a lexical property of these verbs because all derived ditransitives verbs mark the medial argument by dative, thereby showing the canonical case pattern of ditransitives. Surprisingly, all basic ditransitives can be shifted into this canonical pattern, too, by suffixation with *-ut*, as shown in (138b). It is questionable whether *-ut* has any semantic contribution. The portmanteau agreement suffixes on the verb relate to the NPs showing ERG/NOM. In the examples below, the verb ending therefore shifts from 3pl in (138a) to 3sg in (138b).

(138)   Basic ditransitives in Inuit (Bittner 1994:20)
    a. Juuna-p   miiqqa-t   atuakka-mik   nassip-p-a-i.
        J.-ERG   child-PL   book-INST   send.IND-TR-3sg/**3pl**
        'Juuna sent the children a book.'
    b. Juuna-p   atuagaq   miiqqa-nut   nassi-up-p-a-a.
        J.-ERG   book   child-DAT   send-**UT**-IND-TR-3sg/**3sg**
        'Juuna sent a book to the children.'

Both variants of such a ditransitive verb can be causativized. The causee, then, is expressed by dative, and the theme argument is realized by either instrumental or nominative, depending on whether *-ut* is applied or not. The preferred position of arguments is always ERG – NOM (the two arguments the verb agrees with), followed by the other objects according to their hierarchy. Therefore, (139a) exhibits the ordering ERG – NOM – DAT – INST, and (139b) the ordering ERG – NOM – DAT – DAT. Because of this strict ordering, the double dative in (139b) does not lead to any confusion.

(139)   Causative in Inuit (Bittner 1994:86)
    a. Kaali-p qimmi-t irnir-mi-nut puisi-mik nirlir-sip-p-a-i.
        K.-ERG dog-PL son-3sgP-DAT seal-INST feed-CAUS-IND-TR-3sg/**3pl**
        'Kaali let his son feed the dogs seal meat.'
    b. Kaali-p puisi irnir-mi-nut qimmi-nut nirli-ut-sip-p-a-a.
        K.-ERG seal son-3sgP-DAT dog-DAT feed-**UT**-CAUS-IND-TR-3sg/**3sg**
        'Kaali let his son feed the dogs seal meat.'

A suffixal verb of Inuit adds some other higher predicate (such as 'believe', 'want', 'think'), so that the subject of the embedded predicate becomes medial: it is always realized by dative. Again, an instrumental appears if a basic ditransitive verb is affected. (140a) illustrates the embedding of a transitive verb, which leads to the surface pattern ERG – NOM – DAT, while (140b) illustrates the embedding of simple 'give'.

(140)   Suffixal verbs in Inuit (Bittner 1994:59f)
    a. Aani-p miiqqa-t   Juuna-mut paasi-sur-a-i.
        A.-ERG child-PL   J.-DAT   understand-think.IND-TR-3sg/**3pl**
        'Aani thinks that Juuna understands children.'
    b. Kaali-p miiqqa-t Maala-mut atuakka-mik tuni-qqu-va-a-i.
        K.-ERG child-PL M.-DAT   book-INST give-want-IND-TR-3sg/**3pl**
        'Kaali wants Maalat to give the children a book.'

A summary is given in (141).

(141)   Ditransitive verbs in Inuit (West-Greenlandic):
        the verb agrees with ERG and NOM

	λz +hr −lr	λy +hr +lr	λx −hr +lr	VERB(x,y,z)
derived	NOM	DAT	ERG	
basic 'give'	INSTR	NOM	ERG	

As we have seen, dative indicates the medial position of an argument also in Inuit. If typologically and genetically different languages behave so similar, there is reason to believe that the correlation dative ~ medial argument reflects some basic structural property of human language. My explication is that the encoding of argument hierarchy yields two possible features (+hr and +lr), which, if they are combined, automatically lead to this correlation.

Dative-accusative syncretism

I briefly show for two languages (Hindi and Georgian) that even if the distinction between dative and accusative disappears, a language can retain its indirect object type (i.e., the recipient is treated differently from the object of a transitive verb). Hindi has the overt object clitic *ko*, which traditionally is called sometimes accusative and sometimes dative, depending on the further context (Mohanan 1994, Butt 1995). Similarly, Georgian has the overt object suffix *-s*, which traditionally is called dative. For the sake of clarity, I will gloss these morphological elements as accusative markers, specified as +hr.

Both Hindi and Georgian show an accusative-ergative split (see (65) for Hindi), which might have influenced the collapse of dative and accusative. In both languages it is the passive that can indicate the indirect object. In the passive of ditransitive verbs in languages such as German or Japanese the indirect object (the medial argument) remains dative, whereas the direct object (the lowest and therefore less marked argument) is shifted to nominative, as shown in (142). (This shift is forced by the requirement that at least one argument should be realized in the nominative.) Similarly, in both Hindi and Georgian the accusative of the medial argument remains in the passive.

(142)   Passive of ditransitive verbs in German and Japanese[14]
        a. Ihm   wurde   ein Orden   überreicht.
           he.DAT AUX.PASS   a decoration presented
           'A decoration was presented to him.'
        b. Hon-ga   onna-ni   age-rare-ta.
           book-NOM woman-DAT   give-PASS-PAST
           'A book was given to the woman.'

Let us first consider the case-marking of ditransitive verbs in Hindi. (143a) shows a basic ditransitive in the perfect, (143b) a derived ditransitive verb in the perfect, and (143c) the imperfect. The reader will at once observe that the various salience conditions (such as animacy and definiteness) determining the alternation between accusative and nominative, discussed above with regard to (65), do not apply here; on the contrary, the lowest argument is always marked nominative, and the medial argument is always marked accusative. The explanation is that double accusative (which could result from the salience conditions) is forbidden in Hindi, so that the more marked argument role (the medial one) is uniformly preferred to be associated with the more marked case (the accusative).

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14   Japanese passive has several functions. It is also possible that the indirect object becomes nominative, similar to the German *kriegen*-passive: *Er* (NOM) *kriegte einen Orden* (ACC) *verehrt* 'he got presented a decoration'.

(143)   Ditransitive verbs in Hindi (Mohanan 1994)
   a.   Ravii-ne   baalak-ko/*baalak   baccaa/*bacce-ko   diy-aa.
        Ravi-ERG   boy-ACC/*boy.NOM   child.NOM/*child-ACC give.PERF-M
        'Ravi gave a/the child to a/the boy.'
   b.   Ravii-ne   gaay-ko/*gaay   kelaa/*kele-ko   kʰilaay-aa
        Ravi-ERG   cow-ACC/*cow.NOM   banana.NOM/*banana-ACC eat.CAUS.PERF-M
        'Ravi fed a/the cow a/the banana.'
   c.   Ravi   mãã-ko   baccaa   detaa   hai.

        Ravi.NOM mother-ACC   child.NOM give.IMPERF   be.PRES
        'Ravi gives a/the child to the mother'

In the passive of these verbs, nothing changes in the realization of case, except that the highest argument is unrealized.

(144)   Passive of ditransitive verbs in Hindi
        mãã-ko   baccaa   diyaa   gayaa.
        mother-ACC   child.NOM give.PERF   go.PERF
        'The mother was given a/the child'

Thus, the lack of a distinctive dative and the ban against double accusative lead to a simplification of the canonical ditransitive patterns, summarized in (145). Note that the perfect still exhibits three distinct cases, a fact that could have played a role for the dative-accusative collapse to emerge.

(145)   Ditransitive verbs in Hindi: the verb agrees with the higher NOM

	λz +hr −lr	λy +hr +lr	λx −hr +lr	VERB(x,y,z)
perfect	NOM	ACC	ERG	
non-perfect	NOM	ACC	NOM	
passive	NOM	ACC	*	

Let us now turn to Georgian, which behaves in many respects similar to Hindi. Like Hindi, Georgian has developed an ergative that is restricted to some sort of past or completion. The Georgian ergative is exclusively found in the so-called aorist series (of tense-aspect-mood combinations), exemplified in (146a). In all other combinations the ergative is blocked. Differently from Hindi, the present series of Georgian shows double accusative (146b). However, in the passive it is the recipient that remains accusative (146c).

(146)   Aorist, present and passive in Georgian (Joppen-Hellwig 2001:50)
   a.   Ketino-m   Eka-s   xalitša a-čuk-a.

        Ketino-ERG   Eka-ACC   carpet V-present-AOR.3N
        'Ketino presented Eka with a carpet.'
   b.   Ketino Eka-s   xalitša-s   s-čukni-s.

        Ketino Eka-ACC   carpet-ACC   3D-present-PRES.3N
        'Ketino presents Eka with a carpet.'
   c.   xalitša e-čuk-eb-a   Eka-s.

        carpet PASS-present-TH-PRES.3N   Eka-ACC
        'The carpet is presented to Eka.'

Georgian exhibits a third series of tense-aspect-mood, which is best described as evidential (encoding a hear-say constellation) and illustrated in (147). Here, the highest argument is marked by +hr (a situation that we found above – in section 5.1 – as characteristic for experiencer verbs). Since Georgian does not allow the combination of two accusatives of animate nouns, the medial argument gets instead expressed by a semantic case.

(147)   Evidential in Georgian
        Ketino-s   Eka-tvis   xalitša   u-čuk-eb-i-a.
        Ketino-ACC   Eka-for   carpet   V-present-TH-EVID-3N
        'As one says, Ketino presented Eka with a carpet.'

The agreement facts of Georgian would deserve their own chapter (see Wunderlich 1996b, Joppen-Hellwig 2001). It is enough to say that the agreement system is always accusative-based: the verb agrees with the subject and a 1st or 2nd person (highest) object. In addition, consonant-initial verb stems show dative agreement for the 3rd person, see (146b). The lexical feature of the evidential morpheme forces both case reversal and agreement reversal in this mood.

The table in (148) summarizes the case patterns of ditransitive verbs found in Georgian. As in Hindi, the aorist pattern exhibits three distinct structural cases.

(148)   Ditransitive verbs in Georgian: the verb agrees with NOM and the higher ACC

	λz +hr −lr	λy +hr +lr	λx −hr +lr	VERB(x,y,z)
aorist	NOM	ACC	ERG	
present	ACC	ACC	NOM	
passive	NOM	ACC	*	
evidential	NOM	semantic case	ACC	

Georgian also allows derived ditransitive verbs: the initial vowel of a verb can function as an applicative morpheme. In the literature on Georgian, a distinction is made between the objective version, in which a possessor or beneficiary is added (149a), and the superessive version, in which a location (an object on which something is placed) is added (149b). As expected, we find double accusative in the present.

(149)   Objective and superessive version in Georgian (Joppen-Hellwig 2001:117)
        a. mzia   u-cmend-s   da-s   pexsacml-eb-s.
            Mzia   APPL-clean-PRES.3N   sister-ACC   shoe-PL-ACC
            'Mzia cleans the shoes for her sister.'
        b. Mama   a-cer-s   misamart-s   konvert-s.
            father APPL-write-PRES.3N   address.ACC   envelope-ACC
            'Father writes an address on the envelope.'

The passive of these applicatives again preserves the case of the medial argument, as illustrated in (150) and (151). Thus, the medial argument indeed is more marked than the lowest argument. Another, so far unmentioned fact of Georgian is the behavior of plural agreement: in this regard, the verb always agrees with the highest argument rather than with a nominative one, that is, in the passive the verb agrees with the higher object. Therefore, the verb is plural in (150a), but singular in (150b), complying with the number of the beneficiary, and in opposition to what the respective nominative phrases reveal about number.

(150)   Passive of the objective version in Georgian (Joppen-Hellwig 2001:132)
        a. deb-s   pexsacmel-i   e-cmind-eb-a-t.
            sister.PL-ACC   shoe-NOM   APPL.PASS-clean-TH-PRES.3N-PL
            'The shoe is cleaned for the sisters.'
        b. da-s   pexsacml-eb-i e-cmind-eb-a.
            sister-ACC   shoe-PL-NOM   APPL.PASS-clean-TH-PRES.3N
            'The shoes are cleaned for the sister.'

The same choice of number agreement can be observed in the passive of the superessive version, shown in (151).

(151) Passive of the superessive version in Georgian (Joppen-Hellwig 2001:133)
    a. konvert-eb-s   misamart-i   e-cer-eb-a-t.
       envelope-PL-ACC address-NOM APPL.PASS-write-TH-PRES.3N-**PL**
       'The address is written on the envelopes.'
    b. konvert-s   misamart-eb-i   e-cer-eb-a.
       envelope-ACC address-PL-NOM   APPL.PASS-write-TH-PRES.3N
       'The addresses are written on the envelope.'

This clearly indicates that 'envelope' is a higher argument than 'address', and thus behaves as a 'possessor' of the address rather than its location, contrary to what the notion 'superessive' suggests. Again we see that structural generalization can go beyond semantic boundaries. Above we observed (with respect to Nivkh) that the grammatical effects of the predicate LOC are generalized to instances of change of possession (section 6.3, (106)), and here we can observe that the predicate POSS is generalized to instances of change of location. Both are unexpected from a purely semantic perspective.

    Observations like these make the study of languages a fascinating topic: not only differ the surface forms from language to language but also the ranges of semantic templates shaping the contents. Within certain limits, languages differ in their semantic perspectives. In discussing two alternatives of expressing three-place concepts (and the corresponding grammatical means for realizing the three arguments), I claimed that the predicates POSS and LOC offer the basic semantic machinery to perform this task. Consequently, each language has to find a proper generalization for constructions based on either POSS or LOC, so that the borderline between the POSS field and the LOC field is not determined by independent semantic considerations but rather by language-specific grammaticalization. However, grammaticalization processes are not arbitrary. If a language develops alternative constructions, there is usually some inherent division of labor at work. English has developed two constructions for ditransitive verbs (based on POSS, and LOC), and the choice between them follows a clear semantic gradience, as we will see in the next section.

6.6 The English 'dative' alternation

Above I postulated two types of ditransitive verbs from a semantic point of view, change of possession and change of location verbs. Usually these two types are distinguished by formal means. English uses these means not only for a distinction between two classes of ditransitives, but also as alternative realizations for most individual verbs. The two alternatives are the double object (DO) construction and the prepositional object (PO) construction, and the alternating verbs are said to undergo the 'dative alternation' (a somewhat misleading term because English doesn't have a dative.) A question much discussed in the literature is whether this alternation follows from the semantic difference between change of possession and change of location. Pinker (1989), Krifka (2004) and others have argued that this indeed is the case. However, other authors are sceptical. How can it be possible that the verb *give* shifts it semantic reading from (152a) to (152b)?

(152) DO-PO alternation in English
    a. Anna gave Max a photo.   (DO)
    b. Anna gave a photo to Max.   (PO)

The DO-PO alternation is found rather frequently. Bresnan & Nikitina (2003) observed that there are only few verbs that totally resist the DO-PO alternation. The DO construction often is possible with a pronominal recipient (153c), while it is blocked with a nominal recipient (153a). Conversely, the PO construction can be possible with pronouns (154c), while it is blocked with nouns (154a).

(153) DO is possible with pronouns in verbs of imparting a force (*push, pull, carry, lift, lower*), and verbs of communication (*whisper, yell, mumble, mutter*) (Bresnan & Nikitina 2003)
    a. *Susan pushed John the box.   *Susan whispered Rachel the news.

      b.   Susan pushed the box to John.   Susan whispered the news to Rachel.
      c.   Susan pushed **him** the chips.   Susan whispered **me** the answer.

(154)   PO is possible with pronouns (Bresnan & Nikitina 2003)
      a.   The car cost Beth $5000.
      b.   *The car cost $5.000 to Beth.
      c.   It would cost **nothing** to the government.

Similar observations can be made with respect to definiteness, topichood, length of expression etc. The more definite, topical or shorter the expression of the recipient is the better it fits with the DO construction. Bresnan & Nikitina (2003) therefore argue that the choice of construction has to do with other factors than a difference in meaning.

    On the contrary, I think that it is exactly a difference in the semantic representations that helps us to understand the observations made by Bresnan & Nikitina. Let me first say that these authors overestimate the difference in meaning. The predicates POSS(y,z) and LOC(z, AT y) are weakly equivalent because usually if one of them is true, the other is true, too. If z is located at y, then y is able to exert some ownership on z. Conversely, if y has possession of z, than z must be located in some neighborship to y for y being able to exert his possessorship. For this reason, many languages can express possession by means of a locative preposition. (155) shows this for Russian.

(155)   Possession in Russian:
      a.   U menja kniga.   b. U nego   bylo mnogo druzej.
          at me.GEN book   at him.GEN was many   friends.GEN
          'I have the book.'   'He had many friends.'

Moreover, the POSS ≈ LOC alternation is generally possible in languages such as German and English, as exemplified in (156).

(156)   POSS-LOC alternation in German and English
      a.   Das Haus hat drei Bäder.   The house has three bathrooms.
      b.   In dem Haus sind drei Bäder.   There are three bathrooms in the house.

Therefore, no logical reasons prevent us from interpreting a change of possession as a change of location, and vice versa, given that the verbs allow that alternation. The difference in meaning mainly reduces to a difference in argument hierarchy. The possessor is the higher argument of POSS, while it participates in the lower argument of LOC. (Because the possessor only participates in the lower argument of LOC, the predicates POSS and LOC are only weakly equivalent.)

    In German, dative verbs compete with verbs that have a full PP argument (with LOC being external to the verb), which has been exemplified with *schicken* 'send' in (83) above (section 6.1). The dative verb has three nominal arguments, with the recipient as the medial one (157a), while the PP verb has a prepositional phrase (related to the goal) as the third argument (157b). Generally, a PP argument occupies the lowest position.

(157)   Dative verbs vs. PP verbs in German

      a.   Dat: λz λy λx {ACT(x) & BEC POSS(y, z)}
               ACC   DAT   NOM

      b.   PP: λP λz λx {ACT(x,) & P(z)}
               PP   ACC   NOM

In the English PO construction, the preposition is fixed, which can be considered a formal reflex of LOC being incorporated in the semantic representation of the verb. Hence, both variants of English have three nominal arguments, with the only difference that the recipient is medial in DO (158a) but the lowest argument (shaped as a goal) in PO (158b).

(158)   Double object and prepositional object in English :
    a.   DO: λz λy λx {ACT(x) & BEC POSS(y, z)}
                secO   primO
    b.   PO: λy λz λx {ACT(x) & BEC LOC(z, AT y)}
                to   primO

These decomposed representations allow us to make some important predictions. In the DO construction, the recipient should behave consistently as the higher object: it can bind a reflexive theme, can license a negative polarity item (such as *any*), can be moved in multiple questions, etc., which is true according to the several tests applied by Larson (1988). In contrast, in the PO construction the recipient (shaped as a goal) should behave consistently as the lower argument: it can be bound by a theme, cannot be moved in multiple questions, etc.

This is demonstrated here for binding and scope. A quantifier in the higher argument can bind the possessor of a lower argument, but not vice versa, as shown in (159) and (160). The recipient binds the possessor of the theme in the DO construction (159a), and the theme binds the possessor of the recipient=goal in the PO construction (160a), while the respective reversed bindings are excluded (159b, 160b).

(159)   DO construction
    a.   He gave every woman$_i$ her$_i$ baby.
        Which woman$_i$ did you give her$_i$ baby?
    b.   *He gave its$_i$ mother every baby$_i$.

(160)   PO construction
    a.   He gave every baby$_i$ to its$_i$ mother.
        Which baby$_i$ did you give to its$_i$ mother?
    b.   *He gave her$_i$ baby to every woman$_i$.

Similarly, the higher argument has scope over the lower argument; scope reversal is a highly marked option and scarcely acceptable, as shown in (161b) and (162b). The theme can be distributed to multiple recipients in the DO construction, where each girl gets her own telescope in (161a). Conversely, the recipient (=goal) can be distributed to multiple themes in the PO construction, where each telescope ends up at some girl in (162a).

(161)   DO construction (Bresnan & Nikitina 2003)
    a.   Ozzy gave each girl a telescope.
        $\forall y \exists z$ {ACT(*ozzy*) & BEC POSS(y,z)}
    b.   *Ozzy gave a (different) girl each telescope.
        $\forall z \exists y$ {ACT(*ozzy*) & BEC POSS(y,z)}

(162)   PO construction (Bresnan & Nikitina 2003)
    a.   Ozzy gave each telescope to a girl.
        $\forall z \exists y$ {ACT(*ozzy*) & BEC LOC(z,AT y)}
    b. $^{??}$Ozzy gave a (different) telescope to each girl.
        $\forall y \exists z$ {ACT(*ozzy*) & BEC LOC(z,AT y)}

The examples (159) to (162) clearly indicate that both constructions have their own semantic potential to express more complex states of affairs, and therefore it is justified to represent them differently. We are now in the position to come back to the observations made by Bresnan & Nikitina.

The representations in (158) let us predict an asymmetric distribution of the two constructions according to the contextual features listed in (163).

(163)   Differential object marking in ditransitive verbs

more salient	*less salient*
animate	inanimate
1st or 2nd person	3rd person
pronoun	full noun
definite	indefinite

短 short expression   long expression
topic   focus

Each of these contextual features forms a salience scale, which has to be associated with the argument hierarchy found in the DO or PO construction. The concept of harmonic alignment of scales then suggests the following: The more salient an argument is the higher its position should be in argument hierarchy, given that there is a choice. This amounts to the competition scenario in (164).

(164) DO-PO competition:
    a. If the recipient is more salient than the theme, DO is chosen
        (alternatively, PO is blocked).
    b. If the recipient is less salient than the theme, PO is chosen
        (alternatively, DO is blocked).

This prediction turns out to be true. Collins (1995) calculated several factors determining the choice of construction on a broad text basis. He found the following distribution in the DO construction. (In the PO construction, the (reversed) preferences are less striking – around 1.5).

(165)   Preferences in the DO construction (Collins 1995:47)

	Recipient	*Theme*
focus	1	90
topic	14	1
pronoun	11	1
definite	4.5	1
longer	1	3

In the DO construction the recipient is more likely to be the topic (14 times), a pronoun (11 times), or definite (4.5 times) than the theme, but it is less likely to be in the focus or the longer expression. Bresnan & Nikitina (2003) present much more data pointing in the same direction, but are still arguing for *one* underlying semantic representation. However, the fact that these asymmetries can be predicted by harmonic alignment should convince us that different argument hierarchies play a role. The essential function of the lexical decompositions given in (158) is to provide us with a principled way of stating argument hierarchies: the recipient is the higher object in the DO construction but the lower object in the PO construction.

Collins' data also indicate that DO is the marked alternative because it leads to a sharper profile under varying contextual circumstances. For this reason, a child who is confronted with a mixed input of DO and PO data could detect the advantage of the DO construction (in the sense outlined in (164)) more easily than that of the PO construction. This is in accordance with Adone's (2002) observation that Creole-speaking children of the Seychelles overgeneralize the DO construction more readily than the PO construction.

Another more general conclusion can be drawn. The existence of two alternative constructions has the advantage that the speakers can give different contextual weights to an argument. In the choice between DO and PO the speakers weigh the relative salience of the two objects, which is similar to the choice between active and passive, where they weigh the relative salience of subject versus object. It would be interesting to study other types of alternatives under this perspective, for instance, the competition between DO and the serial verb construction, about which only little is known so far.

Sedlak (1975) reports a few observations about West African languages. Twi, which is a dialect of Akan, a Kwa-language of Ghana, prefers the DO construction with a nominal or indefinite theme (166a,b), while a pronominal or definite theme requires a serial verb (SV) construction (167a,b). A similar observation is made by Campbell (1996) for Kwawu, another dialect of Akan (166c, 167c).

(166)   Double object in Akan (Sedlak 1975, Campbell 1996: 101)
    a. ɔ-fɛmm   me ne   pɔ̂nkó nó.
        3sg-lent   1sg 3sgP horse that   'He lent me his horse.'

b. ɔ-maa   me siká   bí.
   3sg-gave   1sg money some   'He gave me some money.'
c. Me-maa   Kofi nwoma (*no).
   1sg-gave   Kofi book   (that)   'I gave Kofi a/*the book.'

(167)   Serial verbs in Akan (Sedlak 1975: 142f., Campbell 1996: 101)
   a. ɔ-de   nó   fɛmm me.
      3sg-take   that   lent   1sg   'He lent it to me.'
   b. ɔ-de   siká nó   maa   me.
      3sg-take   money the gave   1sg   'He lent me the money.'
   c. Me-tOnn nwoma no maa Kofi.
      1sg-sold   book that   gave Kofi   'I sold the book to Kofi.'

From these observations one can conclude that the SV construction offers the ranking theme > recipient (goal) and is therefore optimal for expressing a theme with a more salient contextual value, in contrast to the DO construction with the ranking recipient > theme. This conclusion is further supported by data from Fongbe, a closely related Kwa language of Benin. The sentences in (168) with DO illustrate that a quantifier in the recipient can bind a pronoun in the theme (regardless of how the two arguments are linearly ordered) but not the other way, while (169) with SV shows the reverse, namely that only a quantifier in the theme (the shared argument) can bind a pronoun in the recipient (with only one possible ordering).

(168)   DO construction in Fongbe with the ranking recipient > theme
        (Lefebrve & Brousseau 2001: 455)
   a. Ùn xlé   mè dòkpódòkpó   fɔtóò tɔn.
                                     (or: ...fɔtóò tɔn mè dòkpódòkpó)
      1sg show   person every   picture GEN
      'I showed every person his picture.'
   b. *Ùn xlé   fɔtóò dòkpódòkpó fɔtóó'tɔ́ tɔn
       1sg show picture every   picture.owner GEN
       *'I showed its owner every picture.'

(169)   SV construction in Fongbe with the ranking theme > recipient (=goal)
        (Lefebrve & Brousseau 2001: 463)
   a. Ùn sɔ́   fɔtóò dòkpódòkpó xlé   fɔtóó'tɔ́ tɔn.
      1sg take   picture every   show   picture.owner GEN
      'I showed every picture to its owner.'
   b. *Ùn xlé   fɔtóò tɔn   xlé mè dòkpódòkpó
      1sg take   picture GEN   give   person every
      * 'I showed his picture to every person.'

It follows from these observations that *xlé* 'show' has to be represented by BEC POSS in the DO construction, but by BEC LOC in the SV construction, similarly to English PO in (158b). (That the SV construction is similar to PO is not surprising, given the possibility that prepositions can emerge from a serial verb, see section 4.3.) However, it is fair to say that more elaborated studies are needed in order to see how the choice between DO and SV construction is determined in general.

7. Summary

This survey could have given the impression that the structural profiles of languages are more different and more complicated than one ever had imagined. Despite all necessary differentiations along the way, such a view would be wrong. Languages could be much more diverse and chaotic than they actually are. I tried to show that structural generalizations determine the design of a language and hence the actual classifications of verbs one can find cross-linguis-

tically. Structural generalizations are based on certain semantic similarities and extend them. Once these generalizations have been made, the conditions for further generalizations, and thus for an optimal design, can differ. It is like a journey: if you have started in a certain direction, the conditions for making further choices have changed.

The most obvious classification of verbs is that they can have one, two, three (or even more) arguments. If a verb has only one argument, a further classification is based on semantic factors. The common property of all linguistic types, however, is the fact that they base their design on the asymmetry of transitive verbs, which is both semantical and structural in nature. It is semantical insofar as the difference between agent and patient (or control and affected) is concerned, and it is structural in that this difference is generalized to argument hierarchy, with the agent being higher than the patient. The semantic asymmetry of transitive verbs can also be used to import a classification in the set of intransitive verbs.

The concept of argument hierarchy plays the major role. Several constructional devices translate this hierarchy into linear order or react otherwise to it. Serial verb constructions and the SVO positional type translate the hierarchy, whereas noun incorporation, generalized case, as well as the choice of syntactic pivot, specifically react to the hierarchy. 'Syntactic pivot' is the name of an argument that determines syntactic constructions in that it, for instance, can be relativized or left out in subordinations or coordinations. Cross-linguistically, either the most salient (unmarked) argument or the highest argument are syntactic pivots, and sometimes both under different conditions. It is, moreover, an advantage if in principle every argument can be promoted to achieve this function.

Another important factor for the realization of arguments are the sortal and the referential properties of the arguments themselves (person, animacy etc., as well as specificity and definiteness), whereas their information status only plays a minor role.

There are various possibilities to react on these two demands, i.e., to make visible the argument hierarchy and to account for the individual properties of arguments. In the way of a taxonomy I argued that the following argument linking types have been established cross-linguistically.

1. The active type grammaticalizes the semantic factors that lead to subject-object asymmetry.
2. The inverse type grammaticalizes person hierarchy in the context of argument hierarchy, so that in the end subject-object asymmetry gets neutralized.
3. The voice type grammaticalizes the semantic roles of arguments.
4. The generalized case type grammaticalizes argument hierarchy by a closed feature set, but makes the realization of these features sensitive to semantic factors .
5. The positional type grammaticalizes argument hierarchy by linearization, independent of semantic factors but possibly dependent on information status.

Each of these types favors different subclassifications of verbs. The active type, the voice type, and the generalized case type also allow the expression of noncanonical verb classes by a certain 'deviant' use of their features, i.e., by means of lexical marking .

When it comes to the integration of a third argument, one can clearly see the different potential of the individual types. By and large, the taxonomy gets much more differentiated, but only a few principled ways are added. Particularly interesting are serial verbs (which are on the borderline between morphology and syntax) and noun incorporation (which can even constitute an argument linking type of its own, see section 6.3 above). It is also interesting that languages often have alternative means to realize a third argument, so that the study of the choice between these alternatives (such as the English 'dative' alternation) becomes a worthwhile topic.

Above, I listed five argument linking types. There could be more types, or different ones. Only future research will show us how many different types are possible and in what respect each type constitutes an optimal solution under certain conditions. One might believe that some types are less optimal than others, so that in the long run only a few types will survive, say the generalized case type and the positional type. I am sceptical about it. Under the view of design, the Philippine voice type is quite an elegant solution, and that is even more true for the inverse type. If a linguist without knowledge of Algonquian would have been asked to characterize

which argument linking types are possible, I am quite certain that the inverse type would not have been included in his list. This shows the difficulty: even the best linguists are unable to imagine the range of constructions that can perform a comparatively simple task. But the actual problem lies even deeper because the inverse type is more than just a construction, it offers an 'ingenious' semantics-syntax mapping in which the syntactic subject-object asymmetry, one of the cornerstones of generative grammar, is sacrificed. In acknowledging this fact many introductory books to generative grammar would have to be rewritten. Thus, one aim of my survey is to pledge for more liberality towards typological richness, and at the same time to encourage future research.

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