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ON GRAMMATICAL RELATIONALITY *

CHRISTIAN LEHMANN

This paper is meant as a contribution to the theory of grammar. It attempts to clarify the notion of grammatical relation and applies relational analysis to a couple of illustrative examples from syntax and morphology.

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1. THE ROLE OF WORD ORDER IN THE MARKING OF SYNTACTIC RELATIONS

Linguistic tradition has it that syntactic relations may be set up by the following grammatical means: morphological modification of a relatum, insertion of a relator (a relational word), sequential order and intonation. My first purpose here is to show that the employment of sequential order for the marking of syntactic relations is minimal. I will then deal extensively with the ways in which free and affixal morphemes function as relators. Only an occasional word will be said about intonation.

Sequential order by itself can do little in the expression of meaning, even of a syntactic relation. This is so because the parts of a complex sign cannot but come one after another, be they syntactically related or not; so this sequential relation must in principle

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be kept free from specific semantic implications. It is only in interdependence with grammatical and semantic features stored in elements that sequential relations among elements having such features can achieve syntactic vigour.

If an element *a* of a category A and an element *b* of a category B may be combined by a syntactic relation R to form a construction of category C, the following alternatives exist as regards the sequential ordering of *a* and *b*:

1. They may be freely distributed over the surrounding syntagm. Example: A = accusative object, B = finite verb of Classical Latin. This so-called free word order presupposes that R is expressed by segmental means of whatever kind, given that mere intonation as a means of expressing a grammatical relation presupposes sequential contiguity. The order of *a* and *b* may then express whatever is expressed by properties such as 'coming early in the chain' or 'coming at the end of the chain'. This is usually conceived as functional sentence perspective and does not pertain to the specific syntactic relation R.

2. The elements *a* and *b* may be contiguous, but permutable. Example: head noun and adjective attribute in literary Italian. In this case, less segmental information about the syntactic relation between *a* and *b* is needed, because the fact that they are syntactically related is suggested sufficiently by their belonging to appropriate syntactic categories and by their contiguity, according to the principle that what stands together usually belongs together semantically if this is compatible with lexical information. On the premise that the grammar provides exactly one construction C which A and B may form, the categorial information of *a* and *b*¹ and their contiguity suffice to express relation R (which does not exclude additional segmental expression of R). The sequential order of A and B does not express R, but presupposes it and signals two different shades of it. These shades, again, are not specific meanings attached to the sequential relations 'A before B' vs. 'B before A', but are derived from the interplay of the grammatical information so far established with the implications of the occurrence of a dependent element first or last in its syntagm. These implications have to do with the incline or intrinsic motion of the spoken chain, its inherent orientation from left to right. Recall that TESNIÈRE (1959: 22, 32f) called the order 'controller—dependent' centrifugal and the reverse order centripetal, and cf. already MAROUZEAU 1922:

22lf. Such implications of different directions of linearization are completely general and thus nothing specific to the relation R.

3. The order between the contiguous elements *a* and *b* may be fixed. Here we must distinguish two subcases. a) By far the most common situation is that given the order *ab*, there is no contrasting order *ba*; i.e. the latter sequence yields no construction. Example: preposition and complement in English. There being no opposition, there is no meaning. That is to say, the fixation of the relative order contributes nothing to the syntactic relation beyond what is already established by the contiguity of *a* and *b*. b) The order *ab* contrasts with the order *ba*, which gives a different construction. Only in this situation is R partly expressed by the sequential order of *a* and *b*. Its semantic contribution is minimal, since there is only one binary opposition. I know of only one relevant example, namely the relation between a verb and its primary actants, which in some languages such as English and Indonesian is a subject relation if the order is NP V, but an object relation if the order is V NP. The distinction between these two relations is only partially signalled by sequential order, because most verbs have different selection restrictions for their subject and object, so that lexical semantics contributes to the identification of the relation. Languages in which the primary actants of the verb are grammatically distinguished exclusively by sequential ordering are probably very few.

Sequential order is also relevant in the signification of a syntactic relation between *a* and *b* whenever $A = B$. This sometimes occurs in possessive attribution and apposition. Here the categorial information will not help in the determination of the syntactic functions of the two elements; instead, to the degree that the lexical semantics does not help either, it is their fixed position within the syntagm which allows the identification of their functions. Here it is not, strictly speaking, the syntactic relation R which is identified by the relative position of *a* and *b*, because this is sufficiently identified by the categories in the binary construction; rather, it is the mutual roles of the two elements within the given construction which sequential information allows to ascertain.

In the last two situations described there appears to be a minimal contribution of sequential order in the expression of a specific syntactic relation. However, it is further reduced by the consideration that another factor, intonation, concurs in clarifying syntactic

structure. As long as the imponderable role of this factor cannot be precisely assessed, we can only vaguely expect it to share in the light functional load of relative order in the expression of syntactic relations. An attempt at more precision in this question is made in HAGÈGE 1978.

This conclusion may come as a surprise to someone who has been accustomed to SAPIR's (1921 : 113) view "that sees in word order and stress the primary methods for the expression of all syntactic relations". However, if we take up the reasoning of the beginning of this section we realize that this view can hardly be correct. On the one hand, there is little that can prevent any two elements x and y from occurring one after another in a chain. Communication would be impossible if this mere fact sufficed for them to enter into a syntactic relation. Only if we know on independent grounds that x and y do in fact form a construction can their relative order help pin down their syntactic relation. On the other hand, there are only two possible orderings of any two elements x and y : xy and yx . The mere fact of occurrence before another element, rather than after it, thus can constitute only one binary opposition in the whole syntax. All the specific functions that we fancy sequential order to fulfill are the result of filling in the general scheme 'x before y' with lexical, categorial and constructional information brought into the bargain by x and y and their contiguity. Rather than contributing a positive meaning to grammatical structure, sequential order is more like a phoneme in its contribution to a morpheme's meaning: it has merely differential, oppositive function, confirming or excluding that x and y form a certain construction.²

2. INHERENCE OF GRAMMATICAL RELATIONS

2.1. Terminology

Before we come to the other grammatical means for the signification of syntactic relations, consider what constitutes the syntactic relation between a and b when there is no specific sign of this relation and a and b are permutable *salva relatione*. Examples are: German *läuft schnell* and *schnell läuft* "runs fast", *drischt Korn* and *Korn drischt* "threshes corn", Dyirbal *balan dyugumbil miyanday* and *miyanday balan dyugumbil* "the woman laughs" (cf. DIXON 1972 : 145), French *simple soldat* and *soldat simple* "simple

soldier", German *Häuschen klein* and *klein Häuschen* "little house", etc. In the absence of any grammatical sign of the syntactic relation, one might be inclined to say that it is not expressed, that the particular lexical constellations provided in the examples allow only for a certain semantic relation between the elements, so that given their contiguity, expression of the syntactic relation can be dispensed with. This would be an insufficient answer. The contiguity of the elements is not a necessary condition for this type of construction; in the first three examples, which involve a verb, spatial disjunction of the syntagm does not affect the construction in the least. Moreover, it would be wrong to conclude that only because no sign of the syntactic relation can be seen, it is not there. It is there and asserts itself where it can, for instance in French and German adjective agreement or in the accusative government of the German direct object.

The solution to the puzzle is this: the relation is *i n h e r e n t* in one (or both) of the elements which are related. We say that an element which contains one pole of a grammatical relation is *r e l - a t i o n a l* or has a *g r a m m a t i c a l s l o t*. What this means is that part of the element's lexical equipment, more specifically one of its grammatical properties, is that a specific grammatical relation to an element of a certain category is set up in it and determined by it. Note that here the term 'slot' is not used in the way known from certain distributionalist models as, e.g., tagmemics. I.e., it does not designate a syntagmatic position to be occupied by a filler class. Instead, it designates a property of a sign, namely a kind of socket (to use yet another metaphor) which provides for connection with certain other signs. In this respect, it is similar to HUDSON'S ([1982], ch. 1 and 2) concept of a slot, with the essential difference that this is explicitly a semantic, not a grammatical slot.

Insofar as everything belonging to the significatum of a sign is expressed by its significans, the relationality of an element and, thus, one half of its grammatical relation to another element does have its expression, although none of its own. This is worth emphasizing because there are various accounts of syntactic relations in the literature, in particular the government and binding approach (CHOMSKY 1981, esp. ch. 2.2f) and relational grammar (JOHNSON/POSTAL 1980, PERLMUTTER 1980), that have syntactic relations obtain between nodes of constituent structure. In both models, for

instance, the subject relation links an NP with the next higher clause node, and the direct object relation connects an NP with either the dominating VP node (CHOMSKY) or the same clause node (relational grammar). This means the relations are somehow external to the elements so related. This conception makes it difficult to integrate the notion of syntactic relation with that of valency, i.e. to say such simple things as, e. g., that the fact of there being a direct object is rendered possible by the verb's being transitive. The hypothesis that grammatical relations can be internal to at least one of the elements connected by them avoids this and similar problems.

To my knowledge, this notion of relationality was first used by Ch. FILLMORE, who writes (1968 : 61): "Every language, one can be sure, has nouns which express concepts that are inherently relational. Examples of inherently relational nouns in English are *side*, *daughter*, and *face*." FILLMORE here evidently refers to what have otherwise been called 'inalienably possessed nouns'. H. SEILER has expanded and refined, in several publications (1972, §4; 1975, §2.3; 1976, §4.2; 1981), this concept of relationality, subsuming both inalienable nouns and verbs under the category of relational expression and opposing this to an absolute expression, to which no relation is inherent. The underlying idea, if not the term, can be traced back to G. FREGE, who expresses it as follows (1892 (1966) : 80): "denn von den Teilen eines Gedankens dürfen nicht alle abgeschlossen sein, sondern mindestens einer muß irgendwie ungesättigt oder prädikativ sein, sonst würden sie nicht aneinander haften." 'Unsaturated' clearly means the same as 'relational'. Especially worthy of note is FREGE's contention that this property of linguistic elements is necessary for them to form constructions. His equation of relationality with predicativity is certainly wrong. On the other hand, FREGE is right in not limiting the concept of relationality to nouns.

There is one tradition in logic which opposes 'absolute' to 'relative' terms in a different sense. In a way compatible with set theory, W. QUINE (1960 : 106; 1966 : 119f) defines a relative term as one which establishes a relation between two or more other elements. A relative term is true of objects n -tuplewise, where $n > 1$, and its extension is, accordingly, a set of ordered n -tuples of elements from a universe of individuals. All non-relative terms are absolute; thus, transitive verbs are relative, intransitive verbs are absolute. Given

that according to our above definition one grammatical slot suffices for an element to be relational, it appears that QUINE's relative terms are properly included in our relational terms.

A different trend in logical syntax led to the formulation of categorial grammar. This descriptive model does not use the concepts of syntactic relation or relationality, trying — mistakenly — to reduce them to syntactic categories. However, the categorial notion of an operator which yields a complex expression of some category if applied to an operand of some — possibly different — category (cf. GÜNTHER 1978) comes quite close to our notion of a relational expression.

2.2. Correlates of relationality

In order to provide ourselves with an operational notion of relationality which is workable in grammatical analysis, we will have to identify correlates that can be determined in a methodologically independent way. These are the well-known semantic and structural properties of grammatical relations.

First, bound up with a grammatical slot are constraints on categorial properties of its filler: it must belong to certain grammatical and semantic categories. The actant of a verb must be, e. g., an NP or an adverbial, and specific actants of specific verbs may be required to be concrete or abstract, the latter including "desentential" NPs or adverbials, i.e. nominalized or adverbialized clauses or verbals, as in the direct objects of *to pretend* or *to deign*. Likewise, the complement of an adposition and the possessor of a relational noun must be NPs of various subcategories. The elements modified by determiners, attributes and the like must be nominals (sometimes NPs) of different sorts; different adverbs require verbs or adjectives as their modified head.

When such requirements on the properties of the slot filler become increasingly specific, syntactic subcategorization shades over into semantic selection restrictions. A verb such as *to climb* requires a concrete direct object of some spatial extension. An adjective such as *pregnant* selects expressions designating animate, preferably female beings. Even a preposition such as French *chez* may require its complement to be human. Selection restrictions are the semantic garnish, so to speak, of the syntactic categorization of that element for which there is an open slot.³

Second, a slot comprises the grammatical conditions of its filling, i.e. the conditions under which the filling is obligatory or optional. Thus, the direct object of Engl. *to suggest*, Germ. *vorschlagen* is obligatory, whereas that of *to eat, essen* is optional. The complement of prepositions such as Engl. *from*, Lat. *ab*, Germ. *von* is obligatory, that of *beyond, ultra, jenseits* is optional. The direct object of Germ. *treffen* is optional with the meaning "hit", but obligatory with the meaning "meet". As these examples show, obligatoriness of the slot filler is not a necessary condition of relationality; and it is not even a particularly easily applicable criterion.⁴

The third correlate of a grammatical slot is the identity of the inherent grammatical relation. This is particularly evident in plurivalent (more than one-place) verbs, whose slots do not differ solely in the properties enumerated so far and do not even need to differ in these, but which, above all, bear different relations to different actants. The structural correlates of a grammatical relation are the syntactic status of the dependent element (which may be the relational element or the slot filler) and morphological features that may appear on the relational element or on the slot filler.

Starting with morphosyntactic features of the relational element, we observe that a particularly important structural correlate of relationality is a *g r e e m e n t*. Only relational elements show agreement in such categories as person, number, gender or case; and they agree only with such other elements for which they have a syntactic slot. Thus verbs may agree with their actants, relational nouns with their possessors, adpositions with their complements; and all the adnominal modifiers, such as determiners, quantifiers, adjective and genitive attributes, may agree with their head noun; for details, see LEHMANN 1982(U) and 1983.^{4a} The agreement represents grammatical categories of the element agreed with. It is a sign that the syntactic relation to this latter element is part of the constitution of the relational element.

The syntactic status of a relational element will be affected by the relation only if it is dependent on the related element; then the kind of this dependence will be determined by its own grammatical slot; so much so that determiners are actually not named after their category but after their syntactic function; and in American linguistics the adjective attribute, likewise, is often simply called the adjective, given that the attributive function is its primary one.

Turning now to morphosyntactic features of the slot filler, we

start by observing that its syntactic status may be determined by the relational element. This will be the case when the relational element is the controller of a dependency relation in which the related element is dependent. Thus a verb determines that a specific actant must be a direct object, which may be required to have a specific position vis-a-vis the verb; or it may be required to be a prepositional complement, as in *yield to someone*. Likewise, adpositions determine the syntactic function of their complements to be oblique NPs of various kinds, and relational nouns require their complements to be possessive attributes of one or another kind.

A specific consequence of the syntactic status of an element as determined by the relationality of another element is the morphological form of the former. The main thing to be mentioned here is case government. Thus the verb determines, together with the syntactic status of its actants, also their case; it may require its direct object to show the accusative, but may govern the genitive or ablative (Lat. *reminiscor*, *potior*) of other complements. The verb also determines the unique preposition by which a prepositional complement must be related to it; thus Engl. *depend* demands *on*, whereas Germ. *abhängen* demands *von*. Again, the relational noun may require the genitive of its possessor, and each of the adpositions stipulates the case in which its complement must appear.

To end our survey of the structural correlates identifying a particular grammatical relation, we must mention the grammatical operations linked with a particular relation in the sense of being applicable only to it or to elements bearing it. As a familiar example, we may recall that one of the defining features of the direct object in German is the fact that only the direct object can become the subject of a passive construction. In the application of this criterion, care must be taken to avoid circularity, since it may be necessary to define the grammatical operation, in turn, with reference to the grammatical relation it applies to.

Turning now to the semantic correlate of a particular grammatical relation, we find this in its semantic role, as, e.g., the agent, patient, possessor. Given that a grammatical relation determines the status of the dependent member, leaving the status of the controlling member generally unaffected, we usually conceive of a role as a semantic function of the dependent member and therefore more often speak of a determiner or a quantifier than of a determinatum or quantificatum.

Roles as conceived of here may also be called semantic relations, as they are in functional grammar (cf. DIK 1978 : 15-24, 69 -78) and in word grammar (HUDSON [1982], ch. 1 and 2). Both models regard semantic relations as basic and try to reduce the number and import of the traditional syntactic relations, assigning those left over, above all the subject, to the lexically preestablished semantic relations. As a consequence, DIK's (1978 : 15f, 29f) conception of the constitutive features of a predicate frame is remarkably similar to my conception of the constitutive features of valence (see below §3), with the notable exception of the absence of grammatical relations from his conception.

We may agree with these models on two points. First, it is true that semantic relations may be inherent to lexemes and that they remain relatively stable under valence-changing operations. Second, it is true that a given lexeme may show alternative valence patterns without any morphological changes on the lexeme itself and with little or no change in the semantic relations involved. Examples are *John gave the book to Mary* vs. *John gave Mary the book* and Germ. *den Knopf drücken* vs. *auf den Knopf drücken*, both "press the button". Such considerations have led the authors of both functional and word grammar to regard syntactic relations not as inherent to lexemes, but as somehow accessory and eligible.

On the other hand, it is equally true that alternative valence patterns are generally brought about by valence-changing operations which do leave their morphological traces on the affected lexeme. For example, it is not the case that, given a transitive verbal lexeme, we may optionally assign the subject relation either to the agent or to the patient, according to whether we use the active or the passive. The correct description of the facts would rather be that given such a lexeme, there is one preestablished pairing of semantic and syntactic relations, namely agent with subject, and that by the operation of passivization we may obtain a derived form of that lexeme with a different association of semantic and syntactic relations. See §6 for further discussion. And again, while it may sometimes be difficult to pin down the semantic differences, many of those alternative valence patterns that have been alleged to be synonymous are in fact not. In the well-known example *John sprayed paint on the wall* vs. *John sprayed the wall with paint*, the second version implies that the whole wall was covered with paint, while the first does not (cf. DIK 1978 : 99f). This might well mean

that there is an association of direct object with patient, so that syntactic relations do not change independently from semantic relations. The above examples of Engl. *give*, Germ. *drücken* would then be limiting cases — showing zero morphological change and zero semantic change — of processes that generally associate overt morphological changes with perceptible semantic changes.

Insofar as both functional and word grammar analyze semantic relations as lexically based, they constitute an advance over Ch. FILLMORE' S (1968 and later) case grammar. There the case-roles (a subset of semantic relations) are directly associated with dependent NPs. This is an inadmissible simplification, since while some case-roles are actually directly associated with the dependent NPs, others are inherent in the governing head; cf. LEHMANN 1983, §4.

3. TWO KINDS OF RELATIONALITY

Grammatical relationality may now first be used for a definition of the notion of dependency. A grammatical relation R connecting X with Y is a relation of *d e p e n d e n c y* if and only if X occupies a grammatical slot of Y or vice versa. In a dependency relation, Y *d e p e n d s* on X if and only if X determines the grammatical category of the complex and thus its external relations.


It may be seen from what has been said before that there are two different kinds of dependency relations. Assume there is a dependency relation in which X controls Y; then if Y occupies a slot of X, it is a relation of *g o v e r n m e n t*, whereas if X occupies a slot of Y, it is a relation of *m o d i f i c a t i o n*. Put differently: a governor is a relational controller of dependency, a complement being an element dependent on a relational element; whereas a modifier is a dependent relational element, a modificatum being an element controlling a relational element.⁵ Fl illustrates these definitions.

Fl. *Two kinds of relationality*


Government	Modification
X/ / <i>governor</i>	X <i>modificatum</i>
↓	↓
Y <i>complement</i>	/ / Y <i>modifier</i>

E1. a and b exemplify government and modification, respectively.

E1. a. read// books



b. read //yesterday



Grammatical slots are symbolized by slashes. Slashes preceding their carrier symbolize a modifying slot; slashes following their carrier symbolize a governing slot. Dependency arrows point to the dependent element, as in MATTHEWS 1981.

On the basis of these definitions, we may introduce a last term: the *v a l e n c e* of an element is its overall governing relationality. This includes the total number of governing slots and their structural and semantic properties as enumerated in §2.2. This definition is meant to capture the intuition behind the structuralist notion of valence. It can easily be generalized from the governing relationality to the overall grammatical relationality of an item if this should turn out to be more appropriate.

There are fundamental semantic and syntactic differences between modification and government. Let us first consider the syntactic differences. Modifier constructions are in principle endocentric, so that the combination of an element of a category A with a modifier yields a construction which is again of category A. Government constructions are in principle not endocentric; cf. TOURATIER 1977: 40f and GÜNTHER 1978. A complement is normally an NP (possibly equipped with a case element and/or governed via an adposition). Now the combination of a verb with a direct object yields a verb phrase which cannot again take a direct object. The combination of a verb phrase with a subject does not yield a new verb phrase, but a clause. The combination of a relational noun with a possessive attribute yields an NP, and the combination of an adposition with its complement NP yields neither a complex adposition nor a new NP, but an adpositional phrase.

This behavior of the constructions is predictable from the nature of the two kinds of relationality. It is the controller of a dependency relation which determines the category of the complex construction. The category of a constituent determines its combinatory potential. Now if a syntactic slot of a controller is occupied, its combinatory potential is altered, whereas if a modifier is added to a controller, this does not affect its syntactic behavior. Nevertheless, these distinctions must be taken *cum grano salis*. On the one hand, although a ditransitive verb becomes a transitive verb

(phrase) — and thus something different —, if an indirect object is inserted into the appropriate slot, it is not to be denied that both a ditransitive and a transitive verb (phrase) are a kind of verb phrase. And on the other hand, modifiers cannot be added to a head noun at random. Thus, once an article has been added, the construction is changed into an NP, and no more attributes can then be added. However, despite such borderline phenomena, the basic distinction remains clear enough.

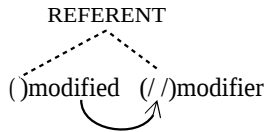
Together with this distributional difference, there is a difference in syntactic status between complements and modifiers. Although both are dependent, modifiers enjoy more syntactic freedom than complements. Given the difference in relationality, the dependence of complements is externally motivated, namely by the government emanating from something else, while the dependence of modifiers is internally motivated, by the nature of their own grammatical slot. Complements are only extensions or "elaborations" (LANGACKER 1981) of a syntactic slot provided elsewhere in the syntagm and are, insofar, completely 'fremdbestimmt' in their syntactic status. Modifiers are adjoined to their head (cf. the traditional term 'adjunct' for a verbal modifier); they add something to it and may approach equal status with it (cf. the above example *inimici Romani*). In a sense, modifying relationality is weaker than governing relationality.

This difference explains, among other things,⁶ the fact that the syntactic position of modifiers is much more often variable than that of complements. For instance in English, the position of all the complements is fixed or almost fixed, whereas some modifiers have a freer position: certain attributes may be pre- or postnominal, quantifiers may float, adverbials may be shifted around. In Latin the only elements with fixed word order are complements, namely the complements of prepositions.

Secondly, there are semantic differences between the relations of government and modification. In order to see this, the following considerations must be premised. An NP identifies something which is its referent. The head noun and its modifiers each have their meaning, which by itself would not suffice to identify that referent. But as they are members of the same NP, each of them refers to the same referent, and jointly they succeed in identifying it. Putting it in terms of predicate calculus, each of them is a semantic predicate with an argument place occupied by the

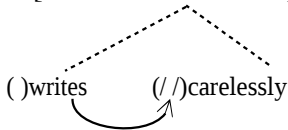
referent. Such a semantic argument place is not to be confused, to be sure, with a grammatical slot. Every noun has an argument place for its referent, but only relational nouns have a syntactic slot for a possessor (which is distinct from the referent). Now what characterizes the relationality of modifiers is that their grammatical slot, occupied by the modificatum, coincides with their semantic argument place, occupied by the referent. This may be diagrammed as in F2, where argument places receive the familiar representation of parentheses.

F2. Modification and reference

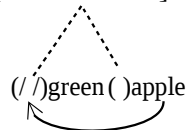


E2. a and b exemplify verbal and nominal modification, respectively.

E2. a. [WRITES CARELESSLY]



b. [GREEN APPLE]



Nouns and adnominal elements such as adjectives, quantifiers and determiners have it in common that they are capable of reference to something conceived as a thing. That is why they were subsumed by the ancients under the common denominator of nouns in the wider sense (*nomina*), of which substantives (nouns in the narrow sense), adjectives, determiners and the like were but species.⁷ The difference between nouns (in the narrow sense) and adnominal modifiers is minimal: the noun may refer independently, whereas the adjective, determiner etc. refer only in dependence on the noun. It suffices to take this noun away and to eliminate the syntactic slot, so the adjective, determiner etc. is substantivized and may refer independently.⁸

What has been shown for adnominal modifiers could be repeated for all other modifiers. Let us agree that a verb may be said to refer, although it certainly does not imply the conception of its referent as a thing. Now the modifiers of a verb —typically, ad-

This claim requires some precision. First of all, it is not meant that grammatical relations do not belong to the grammar (a somewhat paradoxical idea, anyway), that they are totally subject to the idiosyncrasies of the lexicon. If this were so, there would be as many grammatical relations as there are distinct relational morphemes, which means, of course, that there would be no grammatical relations at all. What the claim does mean is that grammatical relations come from the relationality of morphemes. The number and kind of a morpheme's grammatical slots is partly indeed idiosyncratic, not predictable from its meaning or category. Thus, there is nothing in the meaning of Lat. *potior* and *reminiscor* which forces them to govern the ablative and genitive, respectively, and little in the meaning of Germ. *mächtig* which would make one expect that it takes a complement at all, let alone a genitive complement. Cf. also HUDSON (1982): 3.19 on the different transitivities of the semantically similar verbs *dine*, *devour* and *eat*.

On the other hand, there is only a limited number of grammatical relations which may be inherent in morphemes. Many morphemes share their relationality and may be ordered in different syntactic categories or subcategories on this basis. And one does find that the relationality of a morpheme is not totally unrelated to its meaning; cross-linguistically, the same semantic classes tend to be associated with a given type of relationality. Relational nouns, for instance, are typically kinship terms, body parts and parts of space (cf. the quotation from FILLMORE in §2.1). Transitive verbs are typically action verbs; etc. Thus it is not only true that a grammatical relation is based on the relationality of the single morpheme; upon deeper investigation of this point it would probably also turn out to be true that different grammatical relations are based on the relationality of different semantic classes.

The lexical basis of much of what is going on in the grammar has been increasingly recognized in recent models of grammatical description. J. BRESNAN (e.g. 1981) has advanced a 'lexical functional grammar', one of whose basic hypotheses is the "principle of direct syntactic encoding", which determines that "only lexical rules can alter grammatical relations; all syntactic rules must

preserve function-assignments" (p. 47). Likewise, CHOMSKY (1981 : 38f et pass.) proposes a 'Projection Principle' which says, in a simplified version, "that representations at each of the three syntactic levels are projections of lexical properties". Similar proposals have appeared in Montague grammar. The idea is carried to its extreme in word grammar, which maintains (HUDSON [1982] : 3.1) "that there are no units of grammar larger than words".

A second point where more precision in our claim is required is in the extension of the concept 'grammatical relation'. Certain grammatical relations have not been mentioned at all, for instance coordination and apposition. These two, and perhaps others, are not dependency relations. They have been called variously relations of *s o c i a t i o n* (TRUBETZKOY 1939), junction (TESNIÈRE 1959) or juxtaposition (MATTHEWS 1981, ch. 10). They are excluded from dependency because they do not fulfill the defining condition of being based on the relationality of (at least) one of the members of the relation. The fact that relations of sociation are not based on any relationality of the elements combined by them is the reason why there is little or no subordination in them (TRUBETZKOY opposes 'subordination' to 'sociation'); and this is why they appear to be looser than dependency relations.

Thus the primary division in the classification of grammatical relations is between relations of dependency and of sociation. Dependency relations are divided into relations of modification and of government (cf. LEHMANN 1983, §1.1). Dependency relations have summoned the attention of linguists much more than relations of sociation, probably because they are more central to clause structure than the latter. This paper, too, confines itself to dependency relations.

5. RELATIONALITY IN GRAMMATICAL MORPHEMES

We started by asking about the grammatical means by which syntactic relations are set up. Our first step in the answer was to assess the role of word order in this respect. Then it was shown that the most important type of grammatical relations, namely dependency relations, come about through the relationality of morphemes. The question naturally arises: what is the role of the grammatical morphemes, free or bound, which are traditionally said to mark grammatical relations? So we will turn to these now.

5.1. *Free forms*

Some grammatical words have been included implicitly in the preceding discussion of relational words. It was said that determiners are modifiers, which means they have a slot for their determinatum. This is shown in E4, where constituency and dependency are corepresented as in MATTHEWS 1981.

E4. [/ /all [/ /those [/ /old [men]]]]

We see that the grammatical relation of the determiner and the quantifier is the same as that of the adjective attribute. The fact that the adjective attribute leaves the category of the head, namely 'Nominal', intact, whereas the determiner changes it to 'NP', is not represented in E4 because it follows from the meaning of the modifiers and not from their grammatical relation.

Again, when it was said that adpositions have a slot for their complement, grammaticalized prepositions such as *of* and *to* were included. Take a phrase such as *books of John*. There is a relation of attribution — thus of modification — between the nouns *books* and *John*. At first glance, one might say that this relation connects *books* directly with *John*, and the *of* is the outer sign of the relation. A representative of this view is MATTHEWS (1981, ch. 3). If we went by this account, the claim that all dependency relations reside in the relationality of morphemes would be wrong, because not only does *books* lack a slot — it would have to be a governing slot — for a complement of the type of *John*, but *John* also lacks a slot — it would have to be a modifying one — for a head (such as *books*). However, the construction is more subtle than that. First of all, it is clear that *of* is not a symmetric mediator between the head and the dependent. Distribution tests will prove it to form a binary construction with the dependent *John* (cf. *remind me of John*, *John's books*). Secondly, there is a syntactic relation between *of* and *John*, almost completely analogous to the relation of any preposition to its complement. This is a relation of government, brought about by the relationality of the preposition. Thirdly, *of*, like all prepositions, has a second syntactic slot, which makes it, together with its complement, a modifier to a head. (This slot is, in fact, shared with the adverbs, which accounts for the fact, known from traditional and constituent structure grammar, that pre-

positional phrases and adverbs have a similar distribution.) The structure of this phrase is therefore as shown in E5.

E5. books [/ / of / / John]

While there is clearly a relation of modification between *of John* and *books* in E5, things are more complicated when the head of such a genitive construction is a relational noun, such as *front*, *leg* or *determination*, *refusal*. All the tests for government prove that these govern their genitive attributes (cf. MATTHEWS 1981 : 157-159). Notice in particular the degree to which the syntactic shape of the attribute is determined by the head noun: *in front of John*, not **in John's front*; *the ministry's refusal of the offer*, not **the offer's refusal of the ministry* nor **the refusal of the ministry of the offer* etc. Possessive attribution to relational nouns therefore requires the following representation:

E6. front / / / of / / John

Here we have a syntactic relation connecting two slots. There is nothing particularly inconvenient about this situation. It cannot be excluded that a modifying slot coincides with a governing slot. In principle, one and the same grammatical relation may be one of modification if viewed from one side, and one of government if viewed from the other side. Such "contradictory" (BAZELL 1949) or "complementary" (MATTHEWS 1981 : 154f) analyses of one grammatical relation have in fact been argued for in the literature. The problem is rather that all the criteria of government do in fact apply in inalienable possessive attributions such as E6, whereas the criteria for modification, in spite of the presence of the preposition, appear to fail. (MATTHEWS (1981 : 154) argues that within dependency , modification can only be determined negatively, as the absence of government.)

Consider an analogous case, the relation of prepositional phrases to verbs. The phrase *born in Athens* has the following structure:

E7. born [/ / in / / Athens]

There is no problem here since the prepositional phrase is an adjunct to the verb. But consider verbs with prepositional comple-

ments such as *depend on* NP, *regard as* NP, *hope for* NP etc. All the tests for government prove that here the prepositional phrase is governed by the verb. Notice in particular the obligatoriness of the complement of *regard* and the fact that the syntactic shape of the prepositional phrase, in particular the specific preposition itself, is completely determined by the verb. This requires the following representation:

E8. depend / / / / on / / you

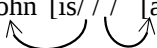


The situation is the same as in E6: on account of the relationality, the prepositional phrase would have to be, at the same time, modifier and complement to the verb; but government appears to override modification.

In §3 it was argued that governing relationality is stronger than modifying relationality. On this basis, it is in fact to be expected that the former overrides the latter when they coincide. I therefore suggest that we take the situation as it is and exploit this result of our analysis for a clarification of terminology. The terminology of government has always vacillated insofar as the governor has been said to govern its nominal complement — where this may or may not be in a prepositional phrase — and to govern the preposition if it was a prepositional complement. I propose that this split terminology is innocuous, because the situation in which it is suited can be identified: it is exactly the situation represented in E8. There we see that it is in fact the case that whenever an adpositional phrase is governed by something else, the adposition itself is also governed. We shall see, below that the same applies not only to adpositions, but also to other case-marking elements.

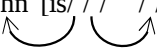
As a last example in this section, consider grammatical verbs. If *to be* functions as a copula, its valence comprises a slot for a subject and one for a predicate NP (or nominal), as in E9.

E9. John [is / / / [a fool]].



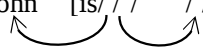
The thing to be noted here is that the predicate NP, just as any NP, opens no grammatical slot. This is sufficient reason, in English as in many other languages, to "verbalize" it by means of a copula, which means that a subject slot is bestowed on it so that it can function as a (verbal) predicate. When the nominal predicate

is constituted by an adjective, the latter's modifying slot is not needed. This is illustrated in E10.

E10. John [is/ / / / /foolish].


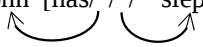
The inherent modifying force of the adjective is overridden by the government emanating from the copula; witness the non-agreement of the predicative adjective in German and, partly, in Russian. There are also languages such as Tolai (Melanesian; U. MOSEL p. c.) in which the adjective is explicitly derelationalized (see §6.2.) if it is to function as predicate.

The same situation obtains when *to be* functions as auxiliary. Consider the English progressive form:

E11. John [is/ / / / / fishing].


Since *fishing* is an infinite verb form, it does not have a subject slot. Its optional modifying slot (see §6.3) is not needed here and is overridden by the governing auxiliary with which it forms a finite verb, employing, as it were, the subject slot of the copula as a substitute for the lost subject slot of the full verb.

The relationality of *to have* will not be analyzed in detail here. Suffice it to say the following: The nature of the oblique complement slot is already unclear with the lexical verb *to have*. It is not a normal direct object, witness such criteria as passivization. For simplification's sake, let us nevertheless call it an object. With the lexical verb, this may be a non-sentential NP of arbitrary complexity. When *to have* functions as a perfect auxiliary, its object slot is occupied by the passive participle,¹⁰ so that the combination yields a finite verb form, as shown in E12.

E12. John [has/ / / / slept].


The formation of the perfect of transitive verbs is more complicated and still resists precise analysis. The object government of the full verb, which has been transformed into modification by the formation of the participle (see §6.3), is sort of revived by its combination with the object government of the auxiliary, just as if only part of the latter's object government were absorbed by the passive participle, the remaining governing force being transmitted,

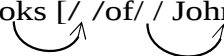

through the modifying relation of the participle, to the direct object of the complex perfect verb form.

The diachronic evolution of the Romance periphrastic perfect with *habere*, as in Ital. *ho comprato un libro* "I have bought a book", may shed some light on the synchronically somewhat intricate situation (cf. RAMAT 1983 for details). The formation originated with transitive verbs. In a construction which must have been something like *habeo librum comparatum* "I have a/the book as a bought one", the object slot of *habere* is filled by what is semantically the object of the full verb, while the passive participle functions as a predicative adjunct. What is important here is that the underlying construction, 'to have X as Y', already involves two entities in the scope of the object slot of the 'have'-verb. This is still true of the modern periphrastic perfect. However, the grammatical function of the participle has been grammaticalized from a predicative adjunct to part of an analytic verb form. Consequently, the direct object no longer depends solely on the auxiliary, but on the complex finite verb. The immediate complement of the auxiliary is, instead, the participle, as in E12. This means that the scope of the object slot of *habere* (or *to have*) has decreased with its grammaticalization;¹¹ it is not filled by a possibly complex constituent, but by an (infinitive verb) form.

Assume that the following principle is valid at the level of combinatorial syntax: If Z depends on Y and Y depends on X, then X and Y cannot form a constituent, since a dependent unit can be combined with its controller only after the former has been combined with all its dependents. The relational analysis of grammatical morphemes shows that this principle becomes inoperative at the morphological level. Whatever the precise nature of the grammatical slot of the past participle within the periphrastic perfect, it seems clear that it is filled by the object in a transitive construction. The precedence principle of combinatorial syntax would determine that the participle first has to be combined with the direct object before it can be combined with the controlling auxiliary.¹² However, constituent analysis of a perfect verb phrase will clearly show the participle to form a constituent with the auxiliary, not with the direct object. Part of the problems arising in the relational analysis at the morphological level stem from such violations of the precedence principle. Clearer cases will be found as we enter the domain of affixal morphology.

5.2. *Affixes*


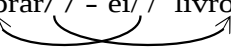
If we apply the concept of relationality to grammatical elements, there is a priori no way to exclude it from bound morphemes and thus to apply our results on syntactic relations to morphology. (In anticipation of this, I have spoken most of the time not of syntactic, but of grammatical relations.) Let me adduce two arguments for this. First, there is an obvious functional analogy between certain free and certain bound grammatical morphemes. If we analyze *books of John* as in E5 (= E13.a), there is little to prevent us from analyzing *John's books* as in E13.b.

- E13. a. books [/ /of/ / John]

- b. [John - / /s/ /] books


Second, there is no neat boundary between syntax and morphology. It is crossed and blurred by grammaticalization, the process which turns lexemes into grammatical morphemes and free into bound morphemes. As an example, we may take up the auxiliary 'have'. The grammaticalization process mentioned in §5.1 also affected Latin *habere* and went further in the Romance languages. There we not only have the analytic perfect illustrated by Spanish *lo he comprado*, Port. (old. literary style) *hei-o comprado* "I have bought it", with an auxiliary closely corresponding to the Engl. *have*. The same verb has become, in the synthetic future, a suffix to the infinitive of the main verb. Port. *compra-lo-ei* "I will buy it" is, historically, *comprar* "to buy" + *lo* "it" + *hei* "I have". As this example from the literary language shows, we are not yet dealing with a typical suffix, since it follows the atonic personal pronoun (of the direct object), which is otherwise independent; cf. *o compro* "I buy it". So will we draw the boundary separating syntax from morphology between the two uses of *haver* in *hei-o comprado* and *compra-lo-ei*? Or if it is not to be drawn here, should it be drawn between the two manifestations of *haver* in *compra-lo-ei* and *o comprarei* id., the latter being the usual form in the colloquial language and corresponding to the construction in the other Romance languages? If we have not succeeded in locating the boundary between syntax and morphology in one of these pairs, it is now too late, because the next stage of grammaticalization is a normal inflectional suffix such as the *-b-* in Lat. *compara-b-o* "I will provide"; if there is no

syntax within *comparabo*, it will be difficult to find syntax within *comprarei*. So we have unwittingly slid from syntax into morphology, and there is no way to tell the point where the type of relation applicable in syntactic analysis ceases to be applicable. Grammaticalization causes syntactic relations to continue as morphological relations.

The construction of Port. *comprarei livros* will consequently be represented as in E14.b. I give the structure of Engl. *have to buy books* in E14.a, only for comparison and in parallel to E13, not, of course, as a guide to the correct analysis of the Portuguese.


- E14. a. have// / /to// / buy// / books

 b. comprar// - ei// livros


As for the government of *to* in E14.a, the comments made on E8 above apply. Notice also an ambiguity of constituent structure reminiscent of the problems we met in the analysis of the perfect auxiliary *have*: it is not clear whether *have to buy* or *to buy books* form a constituent.


Now while one might doubt that the English auxiliary *have* actually illustrates a gradual condensation of the scope of the object slot, there can be no doubt that the scope of the Portuguese future suffix *-ei* is definitely reduced as against the auxiliary *haver*. It can only be filled by the infinitive, plus a possible pronominal clitic, but not by the infinitive plus its nominal complements. So here we have a clear instance where a superordinate constituent (*comprarei*) must be formed before all the dependents of its members have been combined with these (here: *livros* with *comprar*). The necessity of constantly violating the precedence principle of combinatorial syntax distinguishes morphology from syntax. It is a necessary consequence of the reduction in scope of grammatical formatives, which, for its part, is an integral feature of grammaticalization. It is the relational analysis of morphology which allows us to formally represent this situation.

Before we discuss certain problems connected with the analysis in E14.b, let us take up the matter of the prepositions and case affixes dealt with in E7f and E13. Case affixes are in a grammaticalization relationship with adpositions (which explains the analogy in E13). Just as these, they have one slot for the noun or NP that they govern, and another for whatever they modify. This enables them

to connect a noun or NP as an adverbial adjunct with a verb. Thus, the Latin ablative noun of E15 modifies the verb as a locative adverbial (cf. E7).

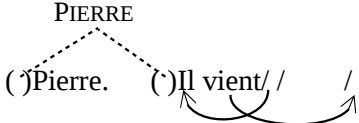
E15. Athen -//is// natus "born in Athens"


So this analysis claims that case affixes govern the nouns which support them. Again, just as a prepositional phrase may be governed by a verb, a noun with a case affix may be so governed. E16 is an example (cf. E8).

E16. puella -//m// amat// "loves the girl"


Here as in E8, the governing relation coming from the verb is superposed on the modifying relation coming from the case affix; the case is governed by the verb. It is tempting to speculate that the famous word order freedom of Latin might have to do with the fact that almost all of the Latin nouns (in the wider sense mentioned in §3) have case affixes and therefore a modifying slot, and that this gives them their relative independence. This idea is essentially prepared by A. MEILLET's (1948 : 145ff) notion of "syntactic autonomy". Cf. LEHMANN 1983 : 370f.

The last phenomenon to be analyzed in some detail here is the person agreement of the governor. It was said in §2 that agreement in person, number or gender is always an indication of a syntactic slot provided by the agreeing element. It has been shown in LEHMANN 1982 (U) that personal agreement indicates government; and to this we will confine the present discussion. Personal agreement affixes are derived, by grammaticalization, from personal pronouns. Consider the following examples from French.

E17. C'est (')Pierre. (')Il vient// //tard.


The anaphoric relation between the NP in the first and the personal pronoun in the second sentence is constituted by their coreference.

It is clear that this is a purely semantic relation, that there is no syntactic relation between *Pierre* and *il* in E17. There is also no doubt that *il* is the subject of *vient* and, thus, governed by it. Problems in the analysis of syntactic relations arise when the referent of the personal pronoun joins the same clause which contains the latter, as in E18.

PIERRE

E18. Pourquoi ()Pierre vient/ /-()il/ /tard ?

Here it is not so clear that *il* is the subject of *vient*; some might want to claim that *Pierre* is the subject. This is certainly so in E19.

E19. Pierre vient/ /.

A major syntactic difference between E18 and E19 lies in the fact that *Pierre* can be dropped from E18 but not from E19. In this respect, E18 is similar to the verb-actant construction in Nahuatl as illustrated by E20.

E20. ni-ki-kwa in naka-tl
 SBJ.1-OBJ.3-eat the meat-ABS "I eat the meat"

This construction has been commented on already by W. v. HUMBOLDT (1836 : 531) with the following words: "Der Satz soll, seiner Form nach, schon im Verbum abgeschlossen erscheinen und wird nur nachher, gleichsam durch Apposition, näher bestimmt." This analysis is still widely advocated by Americanists (cf. BOAS 1911: 30, MILEWSKI 1950 : 174, SEILER 1977 : 227). It means that the NP in E20 - and, by analogy, the NP in E18 - is not governed by the verb, but is in an 'appositive' relationship to the pronominal element. (Apposition cannot be meant here in the strict sense, since the NP and the personal affix do not constitute an NP.) Comparison of E18 with E17 teaches us that this 'apposition' comes about by the condensation, through grammaticalization, of an anaphoric relation. To the degree that the referent NP enters the clause, it becomes subject to the latter's syntax, which means that its relation to the pronominal element - and consequently to the verb - becomes a syntactic relation. On the other hand, to the degree that this relation becomes syntactic, the relation between the pronominal element and the verb becomes morphological. The status of the

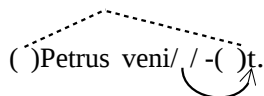
pronominal element in E18 might be called enclitic; in E20 it is clearly affixal. So here we have another example of a government relation in morphology.

Suppose we arrange the constructions illustrated by E17, E18 and E20 in a series of increasing grammaticalization, of syntacticization of the referent-pronoun relation and of morphologicization of the verb-pronoun relation. The next step in this series would be represented by the Latin version of E18.

E21. Cur Petrus venit sero?

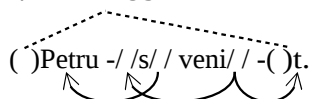
Now here almost everybody agrees that we are dealing with personal agreement of the verb with its subject. However, there have been independent voices. A. SOMMERFELT (1937 : 184), invoking the communis opinio on examples such as E20, contends that 'une phrase latine comme *uir currit* ne doit pas être traduite par "l'homme court", mais par "l'homme, il court"'. This has been taken up by A. W. DE GROOT (1956 : 190), for whom the Latin subject-nominative functions "as an omissible adjunct in an adjunctive group, i.e., as an appositive, so-called 'subject', of a finite verb". If this account were correct, what is commonly called the subject-verb relation in Latin would have to be analyzed as in E22.

E22. PETRUS



However, this account cannot be correct, because it leaves the nominative case of the subject unexplained. If the nominal actant is an apposition to the personal verb ending, one does not see why it should be case-marked; one would expect it to be unmarked, as the NP in E20. The case of the subject has to be analyzed exactly as the case of the object in E16. I therefore propose the following representation instead of E22:

E22'. PETRUS



In order to be exact, we would have to represent different degrees of government and of modification. Most of the governing potential of the verb is used up by the personal ending, which does occupy a large part of the subject slot. However, this is a syntactic slot, and it can therefore extend to something outside the verb. What is left of the governing force of the verb is now a property of the finite form *venit*, and it is conducted along the way of the basically anaphoric, 'appositive' relation of the personal ending to the NP, making this an actant of the verb. On the other hand, the noun gives some complementary indication of its relation to the verb by itself, through the modifying relationality of its suffix.

This overcomplicated apparatus is reduced to its essence in E23.

E23. Peter came/ /.



Here the verb directly governs its subject. I have given the same representation to E19 above, although there the situation is not quite as clear. Although the form *vient* as in E19 has no personal ending, the overall conjugation paradigm is much richer in personal endings than the English one. Nevertheless, the verb-actant syntax in E19 and E23 is apparently alike in crucial respects: in neither sentence can the subject be dropped. This means that the French personal endings do not represent the subject. Proof of this are constructions such as E18: if the personal endings (there is a /t/ in E18 !) had any reference, there would be no need to add the enclitic personal pronoun here.

5.3. Problems with morphological relationality

It will not have escaped the reader that there are serious methodological problems in the application of relational analysis to morphology. The criteria which justify the distinction between dependency and sociation, and within dependency, between government and modification, have been devised for the syntax. They are not always applicable on the morphological level. For instance, if an affix position is obligatorily filled, as is the case position in the Latin noun and the person position in the independent verb, then there is no way to test for the endocentricity of the construction and the relative autonomy of the affix. Or take again the future form *comprarei*. It is obvious that this contains the infinitive,

which consists of the stem plus a suffix *-r*. However, since this affix cannot be lacking from the future, it appears doubtful whether it should be accorded morphological status here. After all, the Latin future of the type *compara-bo* has no infinitive marker between the stem and the tense element, but apparently is semantically fully equivalent to the Portuguese future. Where morphological relations lose their similarity with syntactic relations, criteria for relationality are difficult to come by. We may then take recourse to arguments of analogy, as between *compra-r* and *to buy*, or between *John's* and *of John* (cf. E13). But it is doubtful whether these lead to cogent results.

Such methodological problems have their theoretical source in the workings of grammaticalization. It was the process of grammaticalization that justified our transfer of the concept of relationality from syntax to morphology. We must now recognize that grammaticalization also puts an end to the relationality of morphemes. Dependency relations can only exist among elements that are separable by segmentation. Grammaticalization, however, causes two grammatical categories to fuse in one morpheme. The Latin declension endings express not only the case, but also gender and number of the noun. The present tense forms of the French or Portuguese auxiliary *avoir/haver* express in one morpheme not only the verbal meaning, but also person and number of the subject; and analogously for the future endings of *comprar-ei*. An analysis such as that proposed in E22' for Latin *veni-t* is not feasible with Port. *hei* or the future suffix *-ei*. There is no dependency relation between the future meaning and the pronominal meaning of one morpheme.

If there is only one relation connecting such a complex grammatical morpheme with an external element, its internal structure may be disregarded for the purpose of relational analysis. In this sense, the analysis bestowed on *comprar-ei* in E14.b appears justified. If, however, one component of such a morpheme governs an external element, while another modifies it, this type of analysis loses its plausibility. For instance, the case component of the Latin declension endings governs the noun, but the gender component modifies it (if anything). Therefore, the analyses of E15 etc. are incomplete in this respect.

What is analyzed in this paper as relational grammatical morphemes have usually been described in the past as markers of gram-

grammatical relations, thus virtually begging the question of how exactly the grammatical relation is set up by saying that the relation is the meaning or function of the relator. My emphasis here has been to show that grammatical morphemes set up grammatical relations exactly as lexemes do, namely through their relationality, which they have as a formal grammatical property in addition to their meaning. However, we have met some grammatical morphemes which are completely desemanticized. That is to say, they do have categorial properties and a grammatical slot, but no meaning beyond that. English examples are the genitive morphemes *-s* and *of* or the *to* which forms or subordinates infinitives. These are typically morphemes which in comparable contexts may simply be lacking, the grammatical relation remaining essentially the same. Then it is legitimate to say that the morpheme does no more than mark a certain grammatical relation. Still, it does this by means of the very same formal properties which also set up grammatical relations among morphemes with a more concrete meaning.

Again, it must be admitted that here relational analysis comes to an end. The fact that the case component of the Latin declension suffixes cannot be separated from the gender and number components and is therefore not strictly amenable to a relational analysis is necessarily tied up with the other fact that instead of unravelling the Latin direct object relation by setting up a birelational accusative case affix whose modifying slot coincides with the verbal object relation, as we did in E16, we might simplify things considerably by saying that the accusative ending on the noun is a mark of the noun's being directly governed by the verb. This reinterpretation has certainly been made in Vulgar Latin, and the next step was that such a mark was in fact not needed since the object can as well be directly subject to the corresponding governing slot of the transitive verb. Here the carrier of the relation dissolves itself into the relation itself. Grammaticalization causes the gradual, imperceptible appearance and disappearance of things.

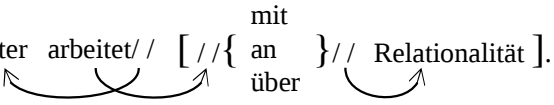


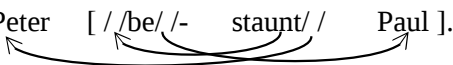
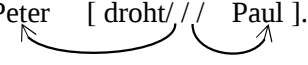

6. RELATIONALITY-CHANGING OPERATIONS

Part of the grammatical information associated with every morpheme or lexeme is a specification of whether it is relational or not, and if so, which relations it contracts. This property is inherent to it, just as gender is inherent to a noun lexeme. However, while the

gender of a noun is irrelevant for its syntactic combinability, the relationality of a lexeme does affect its combinatorial potential. Whenever the relational properties of a lexeme do not fit in the syntagm in which it is to be integrated, operations may be applied which alter its relationality. There are three types of such operations: relationalization, derelationalization, and commutation.¹³ *Relationalization* is the establishment of a slot on a lexeme which previously did not have it. *Derelationalization* is the blocking of a slot of a lexeme so that this is no longer relational in this respect. *Commutation* is the exchange of one type of slot for another. We will illustrate these in turn.

6.1. Relationalization

Relationalization of a verb is the expansion of its valence. There are various ways to do this; the one which is of interest here is to combine the verb with a morpheme that contains the desired slot. The German preverb *be-* is a case in point. It has a modifying slot which selects a verb stem and a governing slot which takes a direct object. If it is prefixed to a verb it bestows on this a direct object slot which subjects an NP to the government of that verb which might be an adjunct without the prefix. The functioning of *be-* is indifferent as to whether the NP which becomes a direct object is an adjunct or a complement to the simple verb. In E24 it is clearly an adjunct, in E25 something in between an adjunct and a complement, in E26 it is clearly a complement, namely an indirect object. (The analysis of the subject relation is simplified in the following examples.)

- E24. a. Peter arbeitet// [// { an } // Relationalität].

- b. Peter [//be// - arbeitet// Relationalität].

- E25. a. Peter staunt// //über// Paul.

- b. Peter [//be// - staunt// Paul].

- E26. a. Peter [droht// Paul].

- b. Peter [//be// - droht// Paul].


When the simple verb already has a direct object slot, this disappears on prefixation with *be-*. What was the object normally becomes an adjunct, as in E27. In rare cases it becomes the new object, so that the relationality of the simple verb is barely changed, as in E28. The only syntactic difference here lies in the obligatoriness of the direct object in E28.b.

- E27. a. Peter lädt/// Heu [//auf// [den// Wagen]].
 b. Peter [//be// -lädt// [den// Wagen]] [//mit// Heu].
- E28. a. Peter [fragt/// Paul].
 b. Peter [//be// - fragt// Paul].

The fact that not even E28.a and b mean the same thing (let alone the other pairs) confirms our heuristic expectation that grammatical morphemes are rarely mere relators, but mostly have a meaning of their own. *Be-* not only adds its direct object slot to the verb, but also its meaning of direct and total affectedness of the object.

Relationalization of a noun commonly means the establishment of a possessor slot on it. In many languages, relational nouns can directly take possessive affixes. The next two examples are from Tolai (MOSEL 1982 : 1, 8).

- E29. tura/ /-gu
 brother-OBL.1.SG "my brother"

So-called alienable nouns do not have the appropriate slot and therefore cannot be directly combined with a (pronominal) possessor. They are relationalized by the addition of one of a set of possessive classifiers which have a modifying slot to combine with the head noun plus a governing slot in which a possessor must be inserted. This is shown in E30.

- E30. / /kau/ /-gu mimum
 CLF-OBL.1.SG adopted child "my adopted child"

Here, again, the relator *ka(u)-* does more than bestow a possessor slot on the noun lacking one; it adds its own meaning of tempo rary possession.

The possessive relationship leads us to another type of relationalization. Instead of relationalizing the possessum, we may relationalize

the possessor by establishing a modifying slot on it. The simplest way to do this is to add a genitive suffix, as in the Latin example E31.

E31. domus patr -//is//

This is one example where the relator really does not more than establish a syntactic slot on its carrier. Only in such cases, where a grammatical morpheme is completely desemantized, is it legitimate to say that it marks a syntactic relation.

An alternative way to make a modifier of the noun *pater* is to equip it with the adjectivizing suffix *-ius*, as in E32.

E32. domus patr -//ia//

Both *patris* in E31 and *patria* in E32 are attributes, but the adjectivizing suffix bestows on the noun, in addition to the modifying slot, the meaning of an essential quality characterizing the head.

Incidentally, there is something to be learnt about word-formation from the relational analysis of cases such as E32. We know that some derivational processes change the word-class of the base, while others leave it unaltered. Now recall that constructions of modification are strictly endocentric, whereas constructions of government are not. From this it follows that if a derivational affix modifies the base, the category of the latter will remain unchanged, as is the case in German preverbatation as exemplified in E24 through E28; whereas if the derivational affix governs the base, the derivational process may imply a recategorization, as it does in E32.

6.2. Derelationalization

Derelationalization may best be visualized as if we were to plug in an opening whose connective potential is not needed in a certain context. A common way to do this is to block the slot with a dummy filler. For instance, if there is nothing to occupy the direct object slot of the Nahuatl verb illustrated by E20, it must be blocked

by a prefix which is etymologically an indefinite pronoun, as shown in E33 (cf. HUMBOLDT 1836 : 531).

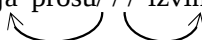
E33. ni-tla-kwa
 SBJ.1-OBJ.IND-eat "I am eating."


The verb form in E33 is derelationalized insofar as it can no longer take a direct object. A fuller and more vivid representation of what is going on here might take the form of E33'.

E33'. ni-/tla/-kwa

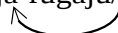
Unfortunately, adoption of this formalism would unduly complicate our graphics, since several of the derelationalizing affixes open their own slots.

A similar result may be achieved by filling the object slot with a reflexive morpheme. A Russian transitive verb may be intransitivized by reflexivization, as E34 and E35 show.

E34. a. ja prošú// izvinenija "I beg (someone's) pardon"


b. ja prošú/ /-s' "I ask (permission, leave)"


E35. a. ja rugáju// Ivana "I scold John"


b. ja rugáju/ /s' "I scold"


Morphemes which transpose a verb stem into the infinitive, such as the German suffix *-en*, fulfill various functions at the same time. One of them is to block the subject slot of the verb; the form *kau fen* "to buy" does not take a subject. On other infinite verb forms see below.

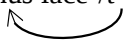
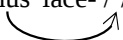
The converse of the relationalization of an alienable noun is the derelationalization of an inalienable noun, which makes it possible to use this without a possessor phrase. This may again be exemplified from Tolai (cf. MOSEL 1982 : 18f). The possessor slot of a body part term such as *ul-* "head", which is usually occupied by a possessive suffix or a nominal possessor, may be blocked by the dummy filler *-a* which derelationalizes the noun. Thus:

E36. a. ul/ /-u-gu
 head-CONN-OBL.1. SG "my head"
 b. ul-a "(someone's) head"

Finally, the modifying slot of an adjective must be blocked when it is to be used as a noun. Hixkaryana (Carib; DERBYSHIRE 1979: 169) has a class of words which function as general modifiers, thus combining the functions of our adjectives and adverbs. The modifying slot of, e.g., *karyhe* "strong(ly)" is blocked by a suffix *-no*, which substantivizes the word: *karyhe-no* "one who is strong". *-no* may be conceived as a dummy noun whose combination with a modifier yields a noun characterized by the meaning of the modifier. In Indo-European languages, the same end is commonly achieved by simply using the adjective as a noun, as in Engl. *the poor*, Lat. *bonum* "the good". It may be left open at this point whether the derelationalizing operation performed here should be described as involving a zero morpheme whose only property is to be a noun and which acts as a dummy filler of the adjective slot.

6.3. Commutation

Commutation of relationality is a class of operations of many shapes, only some of which may be illustrated here. The main division in this class is between commutation between government and modification, on the one hand, and commutation among diverse governing slots, on the other hand. Starting with the first subtype, we observe that the subject slot of a verb may be transformed into a modifying slot with the help of an affix of present participle formation. The relevant structures are illustrated with Latin examples in E37 (E37.a is simplified in comparison with E22').

- E37. a. Venus iace-/t /

 b. Venus iace- / /ns


It may be seen that the *-nt-suffix* achieves the commutation by occupying the subject slot of the verb (in this respect it is similar to the infinitive morpheme), but bestowing on the thus inflected form its own modifying slot. Similar processes take place in the formation of infinite relative clauses, e.g. in Dyrirbal.

The converse operation applies in the verbalization of an adjective. When we derive Lat. *albere*, Russ. *belet'* "to be white" from *albus/belyj* "white", the thematic vowel forming the verb stem evidently transforms the modifying slot of the adjective into a gov-

erning slot for a subject. In this case as well as the preceding one, more precision in the analysis could be reached by taking into account that the verbal subject slot is simultaneously governing and modifying, while the adjectival slot is exclusively modifying.

Certain classes of words seem to incorporate a grammatical relation which may be either modifying or governing. These comprise the cardinal numerals, quantifiers, measure and container nouns. In such phrases as Lat. *mille passus* "a thousand steps" or *multum aurum* "much gold", the numeral and quantifier modify their head noun. In the alternative versions *mille passuum* and *multum auri*, they govern the noun (cf. MAUREL 1983). Similarly, such phrases as Germ. *drei Pfund Mehl* "three pounds of flour" and *zwei Glas Bier* "two glasses of beer", the measure and container phrases may be considered as either modifying or governing the following noun (cf. MATTHEWS 1981 : 156f and KATZ 1982, §2.). In the case of the Latin numerals and quantifiers, a change in category has traditionally been thought to accompany (or even to be the reason for) the commutation of relationality: if modifiers, they are adjectives; if governors, they are substantives (cf. COMRIE 1981, ch. 5.2.). This would be more difficult to argue for in the case of the German measure and container phrases.

The commutation of slots of the same kind is called *conversion*. Since one lexeme cannot have more than one modifying slot (because coreference is an equivalence relation), conversion occurs only among different governing slots, i.e. it amounts to a valence-changing operation. The most important subclass of these are the verbal voices. The core function of the passive is essentially to block the subject slot of a verb.¹⁴ As a consequence, the semantic agent is now no longer governed by the verb and can only be added to it, if at all, in an adjunct provided with a suitable case or adposition. The morphosyntax of certain passive constructions is, in fact, sufficiently characterized by this core feature. Examples are the Latin, German, Dutch etc. passive of intransitive verbs and passives of transitive verbs without object promotion, as in the colloquial Germ. *Jetzt wird sich erst mal die Hände gewaschen!* "Now first hands will be washed !" (example by F. PLANK p. c.), or more regularly, in Russian (KEENAN 1982 : 34 -38) or Ainu (SHIBATANI [1983]) ; cf. also CHOMSKY 1981, ch. 2.7. However, in the more familiar passives of plurivalent verbs, the valence change goes further than that. An oblique actant slot, normally the direct object slot, is

commuted into the subject slot, so that the semantic patient role is now associated with the subject relation. In the inflectional passives of the ancient Indo-European languages, this complex valence change is achieved at one stroke. For instance, in Ancient Greek a suffix *-the-* is used in certain tenses to passivize the verb stem. *-the-* may be described as an operator which occupies the subject slot of a verb and changes its direct object slot into a new subject slot. Periphrastic passives such as in English show more clearly how such a complex valence change may be constituted by a combination of more elementary derelationalizing, commuting and relationalizing operations. First the verb is transposed into a passive participle, which means that its subject slot is blocked by an affix which at the same time changes the object slot from a governing into a modifying one. Then the form is combined with an auxiliary whose oblique slot takes in nominalized verb forms such as the passive participle and which bestows verbal properties on these by lending its subject slot to them (cf. E11). The result is illustrated in E38.

E38. Books [/are/ / bough- / t].

Such a complex interplay of various operations which alter the relationality of a verb is rather frequent. Thus, relationalization by the German preverb *be-* may also involve conversion, since the new direct object may be a former indirect complement of the simple verb, as we saw in E26. Take causativization as a last example. This is relationalization insofar as the causative operator adds a new subject slot to the simple verb. But since the latter already has a subject slot, this must be converted into an oblique slot, usually one of a sort which the verb does not yet have.

A causativizing operator may be a free form, such as Fr. *faire*, or an affix, such as Turk. *-dir*, or a morphonological change, as in Germ. *sitzen* - *setzen*. This shows that the whole gamut from syntactic via morphological to submorphemic relations that we were struggling with in §5.3 is present in the alteration of relationality, too. Moreover, the sum of the examples of this section shows that such operations occur both in inflectional and in word-forming morphology. This amounts to saying that the whole grammar and the semi-regular part of the lexicon is susceptible to an analysis in

terms of relationality. Although many details have been glossed over in this section, it should have become plausible that a precise description of the relevant phenomena is possible only if we take relationality into account.

7. TOWARDS RELATIONAL GRAMMAR

Dependency relations are not set up either by word order or by relators which "mark" a relation. They are not independent from or external to the elements connected by them. Instead, they are inherent in relational morphemes; otherwise, to come back to FREGE, the parts of a syntagm would not cleave to each other. This is valid both for lexical and grammatical morphemes. It implies that the grammatical morphemes that have been traditionally described as relators, as marking different syntactic relations, are in fact themselves only relata of relations. The difference between the Turkish case suffixes *-i* (accusative) and *-e* (dative) does not lie in the fact that they express different grammatical relations. Rather, they contract the same relations, namely, one of government, for which they select an NP, and one of modification, for which they select a verb (phrase). The difference between them lies in their meaning, which is, of course, a grammatical meaning, namely whatever it is that distinguishes direct from indirect affectedness.

If this can be accepted, it has an important consequence for the grammar of dependency relations. Namely, there will be only as many distinct relations as there are distinct types of grammatical slots. This would diminish drastically the number of relations. It may well turn out that there is only one relation of modification and perhaps a couple of relations of government. Everything else would be a matter not of grammatical relations, but of grammatical meanings. A subclassification of the grammatical relations would be achieved by the different syntactic categories selected by the slot, e.g. modification of nouns, modification of verbs, etc.

This reduction of the number of distinct grammatical relations is a consequence of the basic assumptions of this paper. Models which share part of these assumptions, e.g. functional grammar (DIK 1978 : 69 -78) and word grammar (HUDSON [1982], ch. 1 and 2), arrive at similar conclusions and may even go too far in their

reductionism (cf. §2.2). CHOMSKY (1981 : 47 with fn. 20) considers it possible that "the only grammatical functions are heads, complements, adjuncts and subject. Or just heads, complements and adjuncts, if we take INFL [\approx auxiliary] to be head of S, and its subject and VP to be complements of the head." On the other hand, models which do not share these assumptions, notably relational grammar, come out with a proliferation of grammatical relations. Thus, JOHNSON & POSTAL (1980 : 29) visualize a finite, universal set of "less than one hundred" primitive grammatical relations, seventeen of which they enumerate (p. 30). Incidentally, no claims have been put forward in the present paper about the universal status of particular grammatical relations. All that has been claimed is that languages have grammatical slots on their morphemes; but they certainly differ as to which particular slots they have, and this difference may well be typologically relevant. Grammatical analysis can be improved, I think, if relationality is accounted for; and representations of grammatical structure come nearer to reality if the notions of constituency and dependency are refined by the notions of government and modification. Nevertheless, it is not my intention to propose a new 'linguistic model'. Accounting for an aspect of grammatical structure that needs accounting for does not yet constitute a new model of grammatical description. Moreover, the label that might seem to adequately characterize the approach here introduced, namely 'relational grammar', is already occupied by a new linguistic model which tries to account for the relations between the verb and its primary actants . . .

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NOTES

* I thank the anonymous readers of the editorial committee of this journal for helpful criticism of the version first submitted.

¹ Insufficiency of categorial information may lead to constructional ambiguity; cf. *flying planes*, or *inimici Romani* "Roman enemies" or "hostile Romans".

² In view of this, the attempt to define syntactic relations in terms of sequential configurations of constituents, first proposed in CHOMSKY 1965:

68-74 and still defended in CHOMSKY 1981: 42, is misguided. See the criticism in MATTHEWS 1981: 92 f.

³ The functioning of selection restrictions in relationality is described in detail in LANGACKER (1981). His notion of an 'elaboration site' (constituted by selection restrictions) combines well with my 'grammatical slot'. Cf., however, LEHMANN 1983, fn. 2.

⁴ Cf. MATTHEWS 1981, ch. 6 and 7, where obligatoriness is refined by the notion of latency.

^{4a} Such details include nominal predicates and possessum nouns which in some languages agree with their subject and possessor NPs, respectively, although they are not inherently relational, but rather made relational through the agreement (much like an adjective may be substantivized by mere combination with a definite article, although the latter properly presupposes a (substantive) noun as its controller).

⁵ Cf. MATTHEWS 1981: 156 and LEHMANN 1983, §1. The difference between subordination and determination advocated by BAZELL (1949) is based on distributional criteria and bears but a superficial resemblance to the difference between government and modification. CHOMSKY's (1981: 166) definition of 'government' does not oppose this to modification and partly includes the latter. It is based on the notion of 'c-command', which is defined in a quite ad-hoc, patched-up fashion in configurational terms, i.e. without recourse to grammatical relationality. His notion of 'proper government' (p. 274) nevertheless comes remarkably close, in its extension, to the traditional notion of government. It achieves this by relying, in addition, on the concept of complement. As may be seen above, this reverses the definitional hierarchy, since a complement has to be defined as a governed dependent.

⁶ One of those other things is the fact that only modifiers show case agreement and only governors show person agreement. See LEHMANN 1982 (U) and 1983, §3.1.

⁷ CHOMSKY (1981: 48) uses the terms 'noun' and 'substantive' exactly the other way round, which might be thought to bespeak a certain unfamiliarity with grammatical tradition.

⁸ Apposition is normally subsumed under nominal modification. It shares with the other types of nominal modification the coreference with the head noun and the possibility of case agreement. However, the apposition has no syntactic slot for the head. This explains why it never shows obligatory gender or number agreement with the head noun. It would therefore appear wise to exempt the apposition from nominal modification; see below.

⁹ Lenakel (Melanesian) example from LYNCH 1978: 78.

¹⁰ This is also Hudson's ([1982]: 3.7, 3.25) analysis. SEILER's (1973) notion of the "possessor of an act" is relevant here.

¹¹ Cf. LEHMANN 1982 (T), ch. IV. 3.1. — Familiar arguments that tense operators and the like are clause level operators pertain to the semantics, not to the grammatical structure.

¹² This problem could be avoided if the auxiliary were a modifier of the main verb, as MATTHEWS (1981: 156) thinks. However, the argument that he adduces for this solution is of a semantic nature.

¹³ Relationalization and derelationalization were first described by H. SEILER (1975, §4). Compare E35 below with his notion of absolutivization (= derelationalization) in Cahuilla by means of an absolutive suffix.

¹⁴ This now seems to be communis opinio; cf. CHOMSKY 1981: 122-127, KEENAN 1982, §3, SHIBATANI [1983]. The latter argues in detail that since promotion of object to subject is not a necessary feature of passive across languages, it cannot be the reason for the 'demotion of the subject to a 'chômeur', as hypothesized in relational grammar (e.g. FRANTZ 1981: 10).

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