

## SEMANTIC CONSTRAINTS ON DEPENDENCY

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### 1. INTRODUCTION

In this paper I propose the need for semantic constraints on dependency relationships. What I mean by this is basically that dependency cannot account for the entire range of patterned grammatical phenomena in any language, any more than can constituency. Fortunately, however, the set of grammatical phenomena that can be accounted for by dependency does not form an arbitrary set -- either in English, or universally -- and can be characterised quite precisely, so that they can be delimited from other grammatical phenomena which are not best understood in dependency terms. This delimitation can be conceived of in terms of one or more constraints which must be satisfied by a grammatical relationship in order for it to be appropriately or correctly constituted as a dependency relationship. Putting this in slightly different words, the type of constraint I have in mind is one which concerns the delimitation of the grammatical phenomena which are appropriately described under dependency.

More specifically, what I want to propose is that dependency relationships belong to the class of semiotically significant relations in grammar (McGregor in press). They belong to the class of Saussurean signs: entities which are characterised by an indissoluble relationship between some signifier (form) and some signified (meaning). This represents one very general constraint on dependency relationships -- they are signs, not meaningless syntagmatic relationships.

In fact, we can be more precise than this, and narrow down more exactly the types of signifieds that can be found in dependency relations. They belong to the semantic domain of what I call logical meanings, following a use established originally by Halliday (e.g. 1985). I make some attempt in this contribution to characterise these meanings. In doing so, it will be demonstrated that Hudson's proposal (1987) that dependency relations express meaning of the 'kind of type is much too constrained. There are in addition a number of other quite distinct semantic types. I will be proposing a universal typology of logical meanings -- or perhaps better signifieds, emic, rather than etic meanings.

The following propositions encapsulate the argument -- obviously I cannot do justice to each of them here:

1. Grammatical relationships are the most significant and important building blocks of grammar (in the universal sense).
2. There is a subclass of grammatical relationships that are semantically significant; they are signs in the Saussurean sense.
3. Dependency relationships belong to this subclass of semantically significant relations.
4. Dependency relationships do not exhaust this class; there exist semantically significant grammatical relationships which are not of the dependency type.
5. There is a universal alignment between the various types of grammatical relationships and semantic (semiotic) types.
6. Dependency relationships are thus uniquely associated with a semantic type, which serves as a semantic constraint on them.

## 2. ON THE NEED FOR BOTH CONSTITUENCY AND DEPENDENCY RELATIONSHIPS

There is, I am sure, no need for me to dwell on the inadequacies of constituency in the context of the present round table discussion. That constituency is descriptively and theoretically inadequate may be taken for granted. However, a few remarks are in order.

The arguments which have been adduced by dependency grammarians against constituency -- e.g. Hudson 1984, Mel'uk 1988, Starosta 1988 -- have without exception missed the target. Rather than argue against constituency itself, they have been arguments against the need for grammatical units, against the need to recognise units larger than the word in grammar. This is a completely different thing to arguing against constituency, and replicates what I have elsewhere (McGregor 1997) referred to as the fundamental misconception of twentieth century linguistics, namely the confusion of unithood and constituency -- a confusion that has bedeviled virtually every linguistic theory of this century. Unithood properly refers to the relationship between two linguistic units which go together to form another, larger linguistic unit; it is the relationship of 'belonging with' or 'belong to'. Constituency, by contrast is the part-whole relationship. These are clearly very different things. There is a belonging to relationship between myself and a computer; but that computer is not a part of me, or a co-part, along with myself, of something larger. Similarly, '*m*' in *I'm* belongs with *I*, forming a larger linguistic unit, a "construct" which behaves in certain ways as a single united whole, a distributional word. But *I* and '*m*' are not in a sisterhood relationship, co-parts of a larger whole (the reason for this should become clear as the paper unfolds).

As this last observation suggests, the proposition that there is no need for units larger than words is, I believe, contradicted by evidence from a variety of languages. It is not the case that, as Hudson 1984 proposes, units (his "constituents") can be gotted rid of by redundancy rules or the like -- that they are predictable from dependency relationships, so may be identified whenever there is a dependency relationship, and thus by Occam's razor are not

required as a separate category. Secondary predication, for instance, argues against this. We have in *I arrived in Paris drunk* a dependency relationship between *I* and *drunk* (see e.g. Nichols 1978, McGregor in press). But the two do not form a viable linguistic unit together. Admittedly, Hudson does equivocate on this point, and allows that there are certain circumstances in which units are required (e.g. in conjunction); but he appears to make light of this problem.

So the arguments against the need for constituency relationships are irrelevant. My conclusion -- which I cannot argue for in detail in the present context (but see McGregor 1997 and in press) -- is that constituency is necessary in any adequate grammatical theory, although it is certainly not sufficient. There are a number of important grammatical phenomena which cannot be accounted for purely in constituency terms. Unlike most dependency grammarians then I do not believe in the descriptive adequacy of dependency. It is only one of a number of different types of syntagmatic relationship in grammar.

Shaumyan 1987:109 has also argued the need for both constituency and dependency in grammatical theory. As I understand it, however, he takes the view that they are typically (always?) co-present, and represent different ways of viewing a particular piece of linguistic form, much as per Pike's suggestion regarding language as particle, wave and field (Pike 1959). In my opinion they need not necessarily be co-present, and indeed typically are not. If linguistic units X and Y are in a dependency relationship, they will typically not also be in a relationship of co-constituency (though I allow that they may be). In my view, constituency and dependency represent independent types of grammatical relationship, which are as it were visible when linguistic form is viewed from orthogonal perspectives. The difference resembles that between a plan and an elevation in geometrical drawing. So the problem arises as to how do we know when we are dealing with constituency, and when we are dealing with dependency -- and, of course, when we are dealing with something else.

A brief digression is in order at this point. The phenomenon of quotation provides illustration of a grammatical relationship which is neither constituency nor dependency. As has been pointed out in a number of investigations, there are difficulties with the idea that the quoted stretch serves as an "object" complement of the verb of speech, embedded somewhere in the clause (Longacre 1985:252, McGregor 1994, in press:56). The alternative that the relationship is one of dependency -- as suggested e.g. Foley & van Valin 1984 and Halliday 1985 -- fares no better. Neither can satisfactorily account for the fact that in many languages it is possible for the clause of speech to interrupt the quoted clause (at least in direct quotation), as in "*They followed,*" *he said, "his dripping blood until nightfall"*. (Only the embedded or dependent clause can occur within the margins of the main clause, not the reverse.) Nor is it clear how dependency or constituency can account for the contrast, available in many languages, between direct and indirect quotation -- options which have no counterpart in other types of multi-clausal construction.

Thus, I have proposed that along with dependency and constituency, at least one other type of grammatical relationship must be distinguished. I refer to this as conjugational; scoping and framing represent the major types of conjugational relationship.

Returning now to the question of distinguishing among the various types of syntagmatic relationship. To answer it we need first to have a somewhat clearer idea of what is meant by constituency, dependency and conjugational relationships.

I have said that constituency is the part-whole relationship, which is distinct from the relationship 'belongs with/to', which is basically a distributional relationship -- a syntagmatic relationship between things that go together in some respect. As William Haas argued in a little known and rarely cited article published back in 1954, distributional relationships in the strict sense (as employed by American structuralists such as Wells and Harris) are by themselves inadequate to the task of motivating constituency. Only a proper subset of distributional relationships are structurally significant in grammar. Haas argued that distributional relationships must be augmented by other considerations -- they must be constrained -- in order for them to distinguish a grammatically significant class of phenomena.

What is the nature of these constraints? Haas proposed that for relationships to be grammatically significant they must be "functional" relationships. It is necessary to take into account the role or function of a unit in the stretch of speech in which it occurs: "only those distributional relations are relevant that are entailed by functional relations" (Haas 1954:58). Constituency relationships are thus distributional relationships which are also functional: the part must serve some function or role in the whole to which it belongs, a point which Haas subsequently elaborated in Haas 1987:334-335. What I interpret Haas as saying is that constituency relationships are linguistic signs in the Saussurean sense: they are characterised by a particular (quite abstract) form, basically the part-whole relationship, and a particular meaning, the function of the part in the whole. Both of these conditions are required for identifying constituency relationships.

Haas, it seems to me, understood the term "functional" both too broadly, and too narrowly. Too broadly in that everything that represents a genuine grammatical phenomenon appears to be included -- "functional" for Haas appears to separate that which represents linguistically significant phenomena or patterns from that which does not, that which represents arbitrary stretches of speech. And too narrowly in the respect that he saw it as applying only to part-whole relationships. But his arguments do not in fact imply that functional relationships cannot apply between parts that belong to a larger whole. If functional is conceived of in something more like Nichols' (1984) functional/relational, then it is possible to refine Haas' ideas. Only those 'belongs to' relationships which are semiotically significant are referred to as constituency relationships.

What are the consequences of this proposal? It means at minimum that to justify a constituency relationship involves showing that the putative relationship is a meaningful one, that it shows semantic content. If we consider *tracker* in the distributional unit *the tracker-s*, then it appears that this word does fulfil a semantically significant role -- a function -- in the unit: it serves to designate the type of thing being referred to. In this way it contrasts with other Ns such as *police*, *men*, *Aborigines*, *dog*, etc. which enter into paradigmatic relationship with it. For this reason we could give a label Entity to the signified of the constituent relationship. The signifier would be the particular (generalised) part-whole relationship itself, presumably. (I do not attempt to provide a characterisation.)

These suggestions are not, of course, novel. As Haas 1987:334 points out, the notion that functional considerations are essential to any kind of structural description has been widely held in linguistics, by Saussure, the Prague School and even Bloomfield. And more particularly, various schools have taken the view that structure without function (or meaning) is impossible. These include recent (and not so recent) theories such as tagmemics, systemic



functional grammar (Halliday 1985:30ff), applicative grammar (Shaumyan 1987:27), and cognitive grammar (Langacker 1987:316). The idea that constituency relationships should be semiotically significant, that they should be signs, is thus not just my own peculiar notion.

Dependency is basically a relationship between sisters, a part-part relationship. In a similar way to constituency, it is a special subtype of the 'belongs with' relationship, namely the semiotically significant ones.

### 3. THE SEMANTICS OF DEPENDENCY

What I have just proposed is that both constituency and dependency are syntagmatic relationships which are semiotically significant. The same goes for conjugational relationships. Corresponding to this ternary classification of signifiers is a ternary classification of signifieds. In other words, the meanings conveyed by syntagmatic relationships of a given type share important semantic features in common; we do not find relationships of the same type representing vastly different types of meaning either within or across languages. It is this duality in the typology of syntagmatic relationships that makes it particularly significant.

The three types of signifieds are: experiential, logical, and interpersonal, which I now briefly characterise.

The experiential semiotic is that set of sign-signifieds which are defined by and define constituency relationships. This semiotic concerns the construction and representation of the world of experience of human beings, that is, 'reality', both external (what is going on around them) and internal (what is going on inside them, in their consciousness). Constituency relationships provide the speaker with a set of resources for interpreting and reconstructing the various phenomena of their experience, including things and events or happenings.

The logical semiotic is constituted by the signifieds of dependency relationships. It is concerned with the ways in which distinct phenomena of experience are related to one another. And it provides speakers and hearers with means of interpreting and representing these relationships -- including 'and', 'or', 'if', 'when', 'is', and the like (and hence the designation 'logical') -- in language. Such relationships represent connections established or imputed by speakers among the observable phenomena. I perceive a computer and papers on my desk, and may establish a relationship of 'and' between them, representing this linguistically by a logical relationship, as in my previous words a computer and papers. This relationship is not an experiential one, and it gives rise to no new experientiable phenomenon. I perceive the computer and papers; they are involved in an experientiable phenomenon, an act of perception. They play a part in this cognitive process, and this is represented linguistically by the relationship of constituency: the function which a computer and papers serves in the clause *I perceive a computer and papers*.

The interpersonal semiotic is the signified face of conjugational relationships. It is concerned with the construction and maintenance of the socially meaningful activities which are going on between persons in their interactions with one another. Looked at from this perspective, language is a mode of action, rather than a tool for thought; and grammar provides a set of semiotic resources for constructing that action. That is, there is a set of semiotic resources which are turned back, so to speak, on language itself -- more precisely, on linguistic entities -

- so as to construct them as appropriate to the particular mode of action the speaker wishes to perform. For instance, the interrogative mood serves to construct a clause as an utterance performing a certain type of action, typically a question. In so doing, it simultaneously serves to establish the speech roles of questioner and answerer to the interactants in the speech situation.

Of course, the type of dependency I am talking about is radically different from the type generally distinguished in dependency grammars. For one thing, I make a sharp distinction between parataxis, in which the things related by dependency are of equal status, and hypotaxis, where they are not; dependency grammars normally conceive of dependency relationships as exclusively hypotactic. For another, I distinguish -- following a proposal originally made in Halliday 1985 -- between three primary semiotic types -- this being a semiotic classification, and thus simultaneously both formal and functional: extension, elaboration and enhancement.

- In extension, one part extends on another by adding something to it, offering an alternative, or replacing it by something else. This is the relationship that holds between the two Ns in *salt and pepper*, and between the two clauses connected by *or* in *Either you admit you broke it, or you'll have to go to your room*. Associativity -- including comitative ('with') and possessive ('having') -- is also a type of extension.
- In elaboration one of the parts provides additional information on the other, restating it in other words, giving another designation for it, and so on. For example, secondary predicates elaborate on the unit they are dependent on -- *sick* elaborates on *he* in *He arrived sick*, indicating a quality displayed by the referent; this is also the relationship found between the two NPs in apposition in *The prime minister, Mr. Keating, yesterday retracted from his earlier position on Mabo*, where the second NP provides another designation for the first.
- Finally, in enhancement, one of the parts embellishes on the other, providing it with circumstantial type qualification. *Until nightfall* provides this sort of qualification of the referent event in *They followed his dripping blood until nightfall* -- more specifically, it indicates its temporal extent. Likewise, in *When she got there the cupboard was bare*, the *when* clause provides circumstantial information relating to the second, locating it in time. As we will see later, there are (in English and other languages) formal distinctions between these three types which justify setting them up as grammatically distinct.

I am not of course the first person to propose that semantic considerations are relevant to dependency relationships. Hudson 1987 put forward the very intriguing proposal that dependency relationships are 'kind of' relationships semantically, and that the dependent indicates the 'kind of' thing that the head is. This seems to me to be far too constrained. If we are to understand the relationship between conjuncts as dependency relationships, as I have suggested, how can they be considered to be 'kind of' relations? Nor can I make any real sense of the suggestion that in *they followed his dripping blood until nightfall*, *they* and *his dripping blood* indicate kinds of following. This makes no sense at all to me. To adopt this view would be to deprive 'kind of' of all reasonable semantic content. Within the framework of my proposals, 'kind of' is indeed one of the semantic relations signified by dependency relationships, though not the only one. It is one of the second type, namely elaboration. Thus, there is a dependency relation of this kind between the two words *steam* and *train* in the NP *steam train*.

Not only is the semantic feature 'kind of' not involved in the grammatical relationships served by *they* and *his dripping blood* in *They followed his dripping blood until nightfall*, but nor are any of the other types of logical meaning: *they* and *his dripping blood* do not extend on, enhance, or elaborate on *followed*. Thus the semantic constraint precludes the relationships "subject" (Actor, Agent) and "object" (Undergoer) from the class of dependency relationships. Dependency does not, in my view, provide an appropriate way of characterising transitivity. Independent support for this comes from the fact that transitivity is a clausal, rather than a verbal phenomenon, as has been argued by many linguists (e.g. Hopper & Thompson 1980, Halliday 1985, McGregor 1990, 1997). The point is that in a number of languages it is possible to find evidence that the information actually provided by the verb is inadequate to characterise transitivity -- for instance, the number and types of roles that may occur are not (in many languages) predictable from the verb (see McGregor 1990 for detailed arguments in reference to Gooniyandi). It follows from this that the verb cannot be regarded as the centre or head of the clause.

In a similar way, it is clear that a quoted utterance neither extends on, enhances, nor does it elaborate the clause (or verb) of speech -- or vice versa. In *I said "I will not go"* the quote does not add to the clause (verb) of speech -- they are not related by 'and', 'or', 'with', and so on. Nor are they related by relationships of elaboration (attribution, identification, classification ('kind of')), or enhancement (embellishment, spatio-temporal location, etc.).

To give some notion of my ideas as to the place of dependency within grammar as a whole, I provide in Table 1 a list of some of the relationships that fall into dependency, along with a list of some that fall into constituency and conjugation.

Table 1 Classification of some grammatical phenomena

Dependency ~ Logical	Constituency ~ Experiential	Conjugation ~ Interpersonal
N, NP, V, VP, and clause conjunction and disjunction ( <i>the cat and the mouse, I laughed but they cried</i> )	The referential N in an NP ( <i>blood in his dripping blood</i> )	Universal quantification ( <i>all men</i> )
Classification ( <i>electric train</i> ) and qualification ( <i>big dog</i> )	Main verb in a VP ( <i>follow in they vp[might have followed]vp his dripping blood until nightfall</i> )	Intensification ( <i>very sick</i> )
Manner adverbials ( <i>He walked away quickly</i> )	Participant roles -- Actor, Undergoer, Affected	Illocutionary adverbials ( <i>frankly, it makes me sick</i> )
Spatial and temporal location, direction, etc. ( <i>I walked along the grass</i> )	Associated roles -- Agent, Medium (particular subtypes: Instrument and Range)	Expectation modifiers ( <i>I only had one drink</i> )
Accompaniment ( <i>Come with me</i> )	State-of-Affairs (role of verb in <i>they followed him</i> )	Rhetorical modification (e.g. evidentials)

NP-external possession ( <i>I hit him in the head</i> , and various "double object" and "double subject" constructions, and dative constructions (as in French).	Transitivity as a clausal phenomenon (transitive: <i>They followed it</i> ; intransitive: <i>The baby howled</i> )	Epistemic and deontic modals ( <i>Probably I will do it</i> , <i>You should help me</i> )
Ascribing and identifying clauses ( <i>he is a man</i> , <i>she is the president</i> )	Ergativity as a clausal phenomenon (middle: <i>the clothes washed</i> ; non-middle: <i>They washed the clothes</i> )	Illocutionary moods ( <i>Will you come here?</i> , <i>Come here!</i> )
Relative clauses ( <i>This is the house Jack built</i> )	Voice options: passive, antipassive, impersonals, etc.	Tagging ( <i>You took it, didn't you?</i> )
Adverbial clauses ( <i>When they arrived, they made camp</i> )	Embedded clauses ( <i>Drinking too much made him ill</i> )	Quoted speech and complementation ( <i>I don't want to go home</i> )

#### 4. CONCLUSIONS

In this paper I have outlined and recontextualised a few of the ideas developed more fully in McGregor in press, drawing out those aspects most relevant to the theme of this panel. Of course, in the space of a presentation as short as this, I cannot do any more than outline my ideas for how dependency needs to be semantically constrained, restricted to a subset of the range of grammatical relationships deployed in the grammars of human languages.

To conclude, I do not want to make light of the difficulties of presenting a convincing case for these proposals. What really counts as evidence that for instance the transitivity structure of clauses involves constituency rather than dependency relationships? I don't claim to have this justification in my hands.

To conclude, I provide in Table 2, without further comment, my conceptualisation of the types of 'things' that need to be included in any adequate grammatical theory.

Table 2: Fundamental concepts of SG

	Signs	Non-signs
Units	grammatical atoms  simple (atomic) units, that can be ranked according to size: word, phrase, clause	grammatical compounds  compound (molecular) units, non-ranking

		non-grammatical units  units that are purely distributional
Relationships	syntagmatic -- grammatical  three fundamental types:  constituency ~ experiential  dependency ~ logical  conjugational ~ interpersonal	syntagmatic -- distributional  'belongs to', 'belongs with', 'is ordered with respect to'
	syntagmatic #177#grammatical  linking ~ textural	--paradigmatic

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