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Acceptability in Context

1. THE PROBLEM

1.1 One of the crucial problems of current grammatical theories is their empirical foundations. What do grammars actually account for? Linguistic intuitions of native speakers, systematic language use, a set of socioculturally determined conventional norms or something else? It need hardly be recalled here that Chomsky's Saussurean distinction between 'competence' and 'performance' has met with growing criticism, both in psycholinguistics (*cf.* Bever 1970) and in sociolinguistics (Labov 1970). On the one hand, it has been stressed that linguistic intuitions are only a limited part of our linguistic abilities and that cognitive strategies play an important role in our verbal performances. On the other hand, a social basis in the form of a 'homogeneous speech community' has turned out to be a too-gross simplification, and the usual conception of grammatical 'rule' is presumably too idealized. Such and similar objections, based on serious empirical research, has blurred the handy methodological distinction between theoretical properties of utterances, viz. their *grammaticalness*, and their 'real' properties, determining their factual *acceptability*.

1.2 It is the aim of this paper to shed some light on this problem from the point of view of recent work in text or discourse grammars and in pragmatics and their empirical, especially cognitive, basis. In both research directions it has been shown that grammaticalness of sentences and acceptability of utterances, respectively, should be accounted for *relative* to the structure of verbal and non-verbal *context*. Nevertheless, it should be made clear whether the attempts toward the elaboration of some fragments of a text grammar can be empirically warranted (at least from a formal or theoretical point of view). Some familiar questions, concepts and criteria are expected in such an inquiry, e.g., with respect to the 'psychological reality' of discourses or discourse rules and

categories or with respect to the existence of linguistic intuitions about the well-formedness or coherence of discourses or of a clear distinction between a text and a semi-text or non-text of a language.[1]

In the perspective of current work in psychology and psycholinguistics such a 'traditional' approach to the problem of the empirical basis of text or context (pragmatic) grammars must be made with care. For example, we have no a priori grounds for deciding whether some phenomenon should be accounted for in terms of a grammatical 'rule' or in terms of a cognitive 'process'. That deficiency seems to weaken the usual criticism of text grammar, viz. that sentences belong to competence/grammar and discourses to performance/cognitive or social theory, since such a distinction is no longer clear even for sentences. Thus, we witness a progressive merging of grammars and cognitive models, especially in recent proposals in Artificial lntelligence.[2]

1.3 Our main point, thus, is to show that, even if a more sophisticated version of the distinction between grammaticalness and acceptability is maintained, such a distinction should be made explicit in the perspective of systematic (con-)textual analysis. In other words, if a grammar is the central, theoretical core of a theory of performance, it should contain a set of discourse rules and a pragmatic component in order to establish the required connection with models of cognitive strategies and social conventions.

2. THE PHILOSOPHY OF 'ACCEPTABILITY'

2.1 Since the notion of 'grammaticalness' has been given extensive attention, it seems useful to begin our discussion with a brief specification of some central features of the different notions of 'acceptability' in social, psychological and linguistic (meta-)theories. We want to know which explicit meaning can be assigned to such terms as 'accept', 'acceptance', 'acceptability' and their cognates.

2.2 A first problem in such a preliminary philosophical account is whether '(to) accept' should be described as an *act*. According to recent work in action logic,[3] an act is a bodily event, a 'doing' — or the absence of such a doing — caused by a conscious organism, a 'person', able to control his own doings, intending to perform such a doing and usually with the purpose to thereby cause other events to happen, to not happen or (not) to continue. This awkward sentence is an abbreviated informal

definition of the results of much philosophical and logical work and neglects specific intricacies. Now, under this definition, at least one reading of the term 'accept' can be described as an act. When I accept a present or an invitation I usually perform a series of doings (e.g., moving my hand, nodding or saying something). These doings are intentional because I have to decide whether I shall accept something or *refuse* or *reject* it. The purpose of such an act may be the event/ state of my becoming/ being 'happy' with the thing 1 accepted, i.e., the realization of the purpose may be consistent with my wishes and/ or those of somebody else or be consistent with some social convention. The accepted 'thing' may be an object that is concrete and transferable (i.e., in possession), an act or an interaction, with which the desired state or event can be brought about.

We use the verb to *accept*, however, in this reading only in order to denote an act which is not 'situationally evident', so to speak. If, say, somebody gives or sends us a book, it is natural to 'take' or 'receive' it. In an 'accepting' situation, however, there exists a serious possibility that the thing *offered* may be refused or rejected, as we saw above. In such situations we decide whether to accept or to refuse, and hence we have *reasons* or *grounds* for such acts. These reasons are based on our evaluation of the offered object with respect to the chance that its acceptance realizes or continues a desired state of affairs. Hence, the object must satisfy a number of specific properties *judged satisfactory* in that perspective. One of the additional conditions is finally that the one who accepts, the 'acceptor', not only has the freedom to decide whether to accept or not but also has the recognized ability or right to judge whether the desired properties are satisfied. This places the acceptor, perhaps only momentarily, in a dominating position with respect to the 'offerer'.

The logical form of the predicate 'to accept', thus, is at least a four place relation:

(1) X accepts Y from A because of V

or

(2) *X accepts Y, with properties W, from Z.*

A formulation closer to our normal usage of the term would be:

(3) *X accepts Y as U from Z.*

e.g., in such sentences as 'He accepted that book as a present from John', or 'The faculty has accepted that book as a doctoral dissertation', where the objects must satisfy certain criteria. In the formulae (1)-(3) *X* and *Z* are person variables, *Y* an object variable and *V, W* and *U* are property (or intentional object) variables. Other arguments, e.g., for time, place or circumstances, may be added: we may accept something in some possible world which we reject in another because our desires or their possible chances of realization may be different.

2.3 The above analysis, in philosophical jargon, of the act of accepting seems to bear also, at least partially, on our usual understanding of 'acceptability' in linguistics. Substituting the variables in (3) for the corresponding constants, we would get something like:

(4) A (native) speaker-hearer accepts an utterance from another speaker (e.g., a linguist) as a sentence of his language.

This is roughly the full form as it is usually understood, but a couple of difficulties arise. It is true that a native speaker, according to our definitions given above, must be assigned the abilities to judge whether the object satisfies certain properties and, if not, to reject or refuse the object. The properties in question are both grammatical properties and 'cognitive' properties like structural complexity, length, etc. However, it is well-known that the language user may well not be able to accept the utterance 'as a sentence' because he may not have the notion or concept of a sentence at all and certainly not the theoretical concept of a sentence. Thus, he may accept the utterance simply 'as a (good, normal) utterance of his language'. Acceptance, in such cases, may be *implicit* (tacit) or *explicit*. The explicit case is rare and only occurs in those situations where evaluation of utterances is required (in tests and in teaching the language). Acceptance (or rejection) in that case is the intentional act, based on motivated decisions, where the motivation may be intuitive but where the decision itself must be 'known'. As Bever (1970) has pointed out, such an act requires specific (linguistic) abilities.

The implicit case of acceptance is the 'normal' or natural one and occurs in the course o/ a conversation. It may be asked whether 'accepting' in such a case is an act or whether accepting is involved at all.

When hearing an utterance of his language during a conversation, a language user does not seem to do something which we may qualify as the act of acceptance. To be sure, he does listen or read, which are acts, because they are controllable doings: he may decide not to listen or to read. But, the act of acceptance is not simply performed by accomplish-

ing the acts of listening or reading, since these acts are also conditions for rejection. Next, phonemes/ morphemes will be identified and the syntactic structure analyzed with a set of rules and strategies together with a semantic 'parsing' that puts interpreted words or phrases in the appropriate 'logical' categories of a meaning representation, etc. This is (very, very) roughly what *happens*, and perhaps the language user also *does* these things, but they *occur to* his mind rather than his causing them intentionally to happen. They are not even 'mental acts' (whatever that may mean) but series of mental events, i.e., processes. If the process takes a normal course, i.e., if the syntactic structure corresponds to the rules present and the semantic interpretation makes sense, the utterance (as such) is *automatically accepted*, much in the same way as a computer may accept a sentence if it has the appropriate programs to process it. The mental processes going on are thus normally not thought about and may even be inaccessible. We only know that something is *wrong* when the input utterance does *not* satisfy the different rules, strategies and categories we have available (our 'tacit' language knowledge). In that case there are grounds to *reject* the sentence or part of it, a rejection which may be expressed or not. The expressions of rejection are often conventionalized and need not be treated here. Thus, whereas rejection is an act according to the definition, acceptance of a linguistic utterance is either simply a cover term for the complex mental processing or it is a 'negative' act like omissions or forbearances. However, as acts these doings must be intentional, which is hardly the case in sentence processing. So, we'll say that acceptance is an automatized mental act (or series of mental acts) because in certain circumstances it is controlled consciously, thought about and carried out. [n this respect the act is like that of a *decision* (or even is a decision, whether the input utterance satisfies the rules and structures in the processors). Hence, the sole external evidence that a mental act of acceptance is carried out in a course of conversation is the absence of explicit rejections.

The acceptance of an utterance, moreover, is not merely based on syntactic and semantic rules/ strategies but also on *pragmatic* rules, conditions and structures. In that case the utterance is accepted not (only) as an object but as a speech act. Instead of talking of an utterance-object (a token of an utterance type or a sentence type), we may analyze the speech act in the usual way and perhaps speak of morphophonological, syntactic and semantic (propositional, referential) 'acts', with the same proviso for 'acts' as made above. At these levels, the different acts may be said to be appropriate or not, depending on whether in most similar circumstances most language users would accept them, which is

part of the definition of a convention (Lewis 1968). This pragmatic condition reminds us of the fact that the simple phrase 'acceptability of an utterance' (worse: 'of a sentence') not only can be intended as implying an 'act' by hearers/ readers but should also imply some act of the speaker having produced the utterance. 'Producibility' seems too awkward, but we would need a term indicating the fact that an utterance also satisfies the rules and structures (and the intentions) of the speaker. Although we may ideally require that the producible is also acceptable, this may in fact often not be the case.

We shall now attempt to demonstrate that only relative or contextual grammaticalness reflects systematic processes of acceptance.

3. RELATIVE GRAMMATICALNESS

3.1 There are well-known cases of sentences which are grammatical but not acceptable. Let us here analyze some examples of the converse case: 'sentences' which are acceptable but not grammatical in the strict sense:

(5) A: Did you hit him?
B: No. He me.
(6) A: With what has the postman been murdered?
B: John thinks with a knife.
(7) A: Sorry, l couldn't make it in time.
B: Obviously.

As such, the utterances of speaker B can hardly be called grammatical by a grammar accounting for isolated sentences, although they are perfectly acceptable in the whole conversation. Hence cognitive strategies should be called on to help explain such cases of systematic (i.e., not *ad hoc*) acceptability. Strategies operating on the typically *incomplete* B-inputs alone, however, can not be of much help. In (5) there may be ambiguity between direct and indirect object me, in (6) the first interpretation would be that *with a knife* is an instrumental linked with the immediately preceding predicate *think* and in (7) the adverb may be sentence- or predicate-modifying. Hence, any serious cognitive model can account for the B-utterances only in relation to the A-utterances. Structural and substantial information from the preceding utterance is thus necessary for the interpretation, and hence the acceptability, of the following utterances of the conversation: in (5) he substitutes for *you* (referring to B) and *me* substitutes for *him*, where the verb/ predicate remains identical and is deleted in surface structure, whereas in (6) and

(7) a whole proposition is deleted for which one additional category (instrumental, adverb) is provided. It should be stressed that whatever cognitive processes are involved, they must at least partially be based on (all-or-none) rules: e.g., He *I*, in (5) would be both ungrammatical and unacceptable. So it seems to make sense to speak of grammatical and ungrammatical incomplete sentences and that requires treatment of dialogue discourses like (5)-(7) in the grammar. The particular rules, e.g., of substitution and deletion, involved in these examples may well have proper cognitive correlates (avoiding repetition, perceiving/ marking contrastive information, etc.).

3.2 The problem, then, is: what would such a grammar look like? First of all, it must be stressed that the phenomena discussed above regularly appear within the sentence:

(8) I hit him, and he me.
(9) Peter thought that the postman was murdered with an umbrella, but John thinks with a knife.

So, in any case, a grammar must capture the generalization that certain rules apply similarly in complex sentences and in sentence sequences. Given that a classical sentence grammar (syntactically, semantically or categorically based) can account for (8) and (9), the argument would be that the *same* rules (transformations) would account for the discourse phenomenon. This view is the standard criticism against text grammars, and it is correct — at least, as far as these cases are concerned. Of course, some adjustments must be made (for example, transformations would have to apply across 'independent' S-nodes, in which case, what sort of a node would the topmost be?) but they would (perhaps) be marginal. If this is correct, and if the grammar captures the generalization, it would no longer be a sentence grammar but a (weak) discourse grammar because it characterizes structures of discourses. More correctly, the difference would disappear; we would just have grammar, and that is the way it should be.

Thus, an adequate grammar accounts for the structure of (complex) sentences and of certain structures of sentence sequences (discourses) which are based on the same rules determining the structure of complex sentences. In classical terms this might imply, for example, that in such cases the deep structures of the sentence/ sequence are identical but that their surface structures are different. One problem immediately arises here: *why* are these surface structures different; are they just structural variants, i.e., having the same meaning and pragmatic function?

Other questions arise at the same time: if the different structures are variants and if they are based on the same rules, may we freely make sentences out of sequences and sequences out of complex sentences? If so, sentence grammars and discourse grammars coincide. Of course, that assumes that classical sentence grammars provide all the semantic constraints determining complex sentences (which they don't).[4]

3.3 Although it may be demonstrated that important differences (especially pragmatic) hold in general between complex sentence expressions and sequences, we shall take some clear cases where a sequence is not easily reduced to a complex sentence with the same meaning:

(10) (a) John! Can you hear me? Shall I help you?
(b) *John, can you hear me and shall 1 help you?
(11) (a) Can you tell me the time? I have no watch.
(b) *Can you tell me the time and I have no watch.
(c) Did you tell him the time because he had no watch.
(12) (a) I promise to be there in time. Will you also be there?
(b) *I promise to be there in time and will you also be there?
(13) (a) Yesterday I had a funny dream. I was president and ...
(b) *Yesterday 1 had a funny dream and 1 was president ...
(14) (a) Peter is drunk. He always is when he visits Amsterdam.
(b) ?Peter is drunk and he always is when he visits Amsterdam.
(l5) (a) Perhaps Harry is ill. He was not at the meeting.
(b) *Perhaps Harry is ill because he was not at the meeting.

In all these cases the (b)-sentences are ungrammatical, awkward or mean something different from the (a)-sentences. Apparently, utterances manifesting different speech acts (like request and statement in (11)), having different (meta-)levels of communication as in (10), sentences under the scope of some 'world-creating' noun (predicate) as in (13), generalizations (14) and motivations/ conclusions can not simply be expressed in one sentence.

Although we cannot, in this brief paper, give a serious analysis of the examples, we may note that the ungrammaticalness of the (b)-sentences is essentially for pragmatic reasons. Thus, in (11) the meaning of the second sentence is not directly connected with the meaning of the first sentence. Rather the proposition underlying the second sentence is a condition for the appropriateness of the speech act of a request or question, i.e., a question is appropriate only if I do not yet know the answer or have no means to supply the answer myself (by looking at my

watch). More generally, we might suppose that a sequence of sentences is a one-many mapping from speech acts: one speech act may be accomplished by the utterance of one or more sentences, but several speech acts cannot be accomplished by uttering one sentence except perhaps in cases of indirect speech acts, see Searle (1973) and Franck (1974). The theoretical problems are intricate here. An alternative proposal may be that sentences and speech acts are related by a one-one mapping: each sentence-utterance accomplishes one speech act. Yet, at least at one level of description (see below), it might be useful to let a whole sequence-utterance be one speech act, e.g., a statement. Thus the sequence

(l6) I am cold. Could you please close the window?

manifests a statement and a request, but as a whole seems to function as a request, where the statement specifies one of the conditions, viz.. the motivation, of the request. If this observation is correct, mappings from pragmatic structures may have discourses or fragments of discourses as their scope and not only sentences. Notice also that a one-sentence version of (16), viz.

(17) I am cold, so could you please close the window?

has very peculiar properties. The connecting so, here, does not have semantic character, i.e., relating facts or propositions by causal, logical or conceptual implication, but has pragmatic character: it relates the fact expressed in the first sentence with the action (viz. the request) of appropriately uttering the second sentence, not with the 'content' of that second sentence, at least not directly. This is perhaps a reason why the written version of (17) is not well-formed because so should introduce a new, independent sentence. Our intuitions about sentence boundaries seem to be very unreliable indeed as an empirical base for a (sentence) grammar.

3.4 The conclusions which may be drawn from the preceding (admittedly still highly informal) remarks seem to be the following: (a) a grammar accounting for isolated sentences underpredicts their (un-)acceptability — as utterances — in a discourse; (b) acceptability of sentences in a discourse is not only based on cognitive interpretative processes but on rules which may also hold for complex sentences; (c) theoretical notions like 'sequence', 'discourse' or 'text' are necessary because not every discourse can be reduced to a complex sentence (nor the converse, *cf. if*-clauses); (d) whatever the semantic equivalence of sentences with

sequences. their surface differences are based on underlying pragmatic differences. Finally, it may be noticed without further examples that sentences which as such are both grammatical and acceptable may become unacceptable in the discourse, e.g., because of presupposition violations. That is, a sentence can be interpreted only, and hence accepted, relative to the set of interpretations of previous sentences (a set which may be empty, see below). In formal semantic terms, not to be spelled out here, this means that a sentence can be interpreted only in those model structures related with the model structures of the previous sentences. That is, instead of sentence models we have discourse or *text models* (Ballmer 1972).

Thus, the general conclusion is that acceptability is in principle better 'modeled' by a grammar accounting for the structure of sequences.

4 PRAGMATIC ACCEPTABILITY

4.1 Sentences are not only interpreted/accepted with respect to previous sentences (indeed, the previous sentence set may be empty as we saw) but also to pragmatic context. Neither the precise structure of the pragmatic context nor the rules and constraints relating it with the structure of the utterance can be discussed herc.5 We shall assume a pragmatic context to be defined primarily in terms of sets of propositions and rules characterizing the internal structure of speaker and hearer: their knowledge, beliefs, wishes, etc. Semantic models are in this way 'contextualized' with respect to speaker and hearer and some other properties of the (fragment of the) possible world in which they are communicating.

A first generalization which comes to mind is to reduce all 'textual' rules to 'contextual' rules. That is, we let constraints from preceding sentences be equivalent to constraints from 'previous' propositions in the epistemic sets of speaker and hearer, changing linearly with the production of subsequent sentences. Elsewhere (van Dijk 1974a), we have given some arguments against such a reduction of a discourse grammar to a pragmatic sentence grammar: the pragmatic component must be added to a proper discourse grammar. Above, for example, we hinted already at the fact that pragmatic mappings may have whole discourses as their scope.

Although it cannot be denied that sentences change the pragmatic context (e.g., the knowledge of the hearer), the constraints in an uttered discourse cannot be fully explained on the basis of an (ordered?) set of

propositions alone, e.g., a presupposition base. On the other hand, such a pragmatic base is necessary, e.g., for the interpretation of pronouns that have no antecedents and are being used deictically. Similarly, previous sentences as such are not enough to provide the necessary information for the interpretation of following sentences; entailments, meaning postulates, etc., based on previous sentences must be supplied by the set of pragmatic presuppositions and corresponding inference rules. What is also needed is the preceding *verbal* (surface) structure of previous sentences. Assuming that a passive sentence has an abstract underlying proposition with a structure like its active counterpart, we would not be able to explain why the following discourse is ungrammatical:

(18) A: Was he hit by you?
B: *No. He me.

Other arguments against the reduction hypothesis relate to the use of connectives, adverbs, predicates, etc. (*thus, consequently, conclude*), presupposing previous sentences/ utterances, not merely propositions (which might have entered the epistemic set of the hearer in a different way). Hence, a discourse may have its proper underlying theoretical unit (a 'text') even when, in performance, production and perception are controlled by linear cognitive processes moving from sentence/ clause to sentence/ clause.

4.2 Utterances, as we saw, are acceptable if their underlying discourses satisfy the rules of relative grammaticalness and interpretability. At the same time an utterance is acceptable in a conversation only if it is a speech act which is also *appropriate relative to* other (speech) acts of the conversation or interaction. The various appropriateness conditions are those given in recent philosophical and linguistic work and need not be specified here for the different speech acts. Thus it seems difficult to have one discourse-utterance manifesting both a request and an order because the preparatory conditions for these acts are inconsistent. Similarly, a request for an object can not precede or co-occur with the act of taking the object by force. Thus, just as a sentence can not be said to be grammatical/ acceptable in isolation, so a speech act can not be said to be acceptable in isolation: two speech acts which as such are both appropriate may be incoherent or inconsistent or may have conflicting contextual pre-conditions. The same holds for the function of speech acts in interaction, though this is not an object for linguistics proper but for sociolinguistics or sociology.

4.3 An additional argument must be given for the hypothesis that a discourse apparently manifesting more than one speech act has nevertheless, as a whole, the function of one speech act. Consider the following dialogue:

(19) A: May I borrow your car? I'll bring it back at five.
B: O. K.

The affirmative answer of speaker B may be given only after a question-request and is usually pointless (or optional) after a promise. Therefore, it seems as if A's discourse should be interpreted as a request or as a request act where the promise act is 'auxiliary' or subordinated to the request. If the latter observation is correct, it would seem sensible to assign a *hierarchical structure* to a speech act sequence of a conversation, much in the same way as our other actions, though linearly (or concurrently) ordered in time. We light our pipe as an auxiliary to the act of smoking and strike a match in order to light the pipe, etc. Hence the acceptability of a word, phrase, sentence, discourse and their respective utterances and speech acts themselves is relative not only to linearly preceding elements but to a hierarchical structure. This means that discourses, at the pragmatic level, too, cannot possibly be satisfactorily described in terms of a sentence grammar merely generating sequences of which only the sentences have hierarchical structure.

5. MACRO-STRUCTURES

5.1 Returning to the structure of the discourse, we have one result, viz. that grammaticalness of sentences is *linearly relative* to preceding sentences or propositions in text and pragmatic context, and one hypothesis, viz. that sentences are *hierarchically relative* to the semantic representation of the discourse, as it is syntactically expressed in complex sentences. Consider, e.g., the following discourse:

(20) Mary has met a bright guy from Harvard. He is red-haired and wears horn-rimmed spectacles.

Here, the second sentence is semantically modifying the object of the first sentence. Similarly, further specification may be given of the particular meeting of the pair.

In this perspective, a third hypothesis may be formulated: underlying the linear and hierarchical structure of the sequence of sentences, there seems to be evidence for the presence of a more global level of semantic

representation, which has been called the *macro-structure* of the discourse. A macro-structure is a theoretical construct, consisting of a hierarchical structure of propositions. Predicates or propositions from this macro-structure abstractly represent sets of sentences or propositions at the micro-level (sequence) level of the discourse. Thus a structure like (PAST) (MEET) [Mary, (CLEVER) (MAN)] may underlie, intuitively, a long description of the meeting and of the man Mary met. Such macro-structures may be directly expressed in the discourse, e.g., in the first sentence of (20), where they may announce or resume the *global meaning* of the whole discourse. This is a first piece of linguistic (semantic) evidence.

Secondly, a sentence in a discourse may have the necessary syntactic and semantic relations with previous sentences, but this constraint is not sufficient to define one *globally coherent* discourse. That is, each sentence might provide a further associative proliferation of any of the concepts in the preceding sentences. However, it is an empirical fact that in general such discourses are not acceptable. The linear expansion must be structured under macro-constraints. That is, each sentence must be functionally dependent on at least one macro-category, e.g., AGENT or ACTION, or PLACE, etc. Thus, each semantic representation of a sentence in a discourse is conceptually associated with a macro-concept. Again, this is a property of the discourse itself and not (merely) a fact of cognitive processing.

Thirdly, (types of) discourses are acceptable only if their macro-structure satisfies a number of further constraints. Both theoretical and empirical research on narrative discourse, for example, have resulted in the establishment of a macro-syntax, for which terms such as 'introduction', 'complication', 'resolution' and 'conclusion' have been used.[6] Similar categories were known already in ancient rhetoric.

5.2 Other arguments in favor of a macro-structural component in a discourse grammar may be provided. However, there are a number of difficulties which must not be overlooked and which require particular care with the formulation of such an hypothesis:

(1) Although perhaps empirical (cognitive) evidence for macro-structures can be assessed – see below – the arguments in favor of an account in the grammar are weak.

(2) Whatever the grammatical evidence for such structures, a serious grammar for macro-structures requires explicit categories, rules of derivation and interpretation, which have not yet been provided.

(3) Even if a formal language for their description would be provided

we would not yet have the rules mapping macro-structures into sentential representations of the sentences of the discourse – and hence a relation with surface structures – which is essential for any grammar.

These and similar critical arguments against a macro-structure hypothesis have been mentioned in the literature,[7] and they are justified. If a solution to these problems can be provided at all, it would at least take the following arguments into account:

(1) No strict distinction can be made between a justification for grammatical rules and categories, on the one hand, and cognitive processes and categories, on the other hand.

(2) A formal language for macro-structures has the same format as any adequate language accounting for 'meaning'-structures.

(3) If a solution for argument (3) above can be found this would provide sufficient ground for having a macro-structure theory in the grammar.

(4) Besides purely formal problems, the hypothesis requires much more empirical (descriptive) warrants: hardly any systematic and explicit discourse descriptions have been given in linguistic research.

Another problem upon which the hypothesis depends is the precise formulation of the aims and tasks of a (linguistic) semantics. If such a semantics would have to assign 'meaning-structures' to utterance-types, then there are no a *priori* reasons why such meanings would not also have the 'holistic' nature postulated in a macro-structure hypothesis. Along the usual Frege-Tarski line, both linguistic and formal semantics are required to construct an interpretation of an expression on the interpretation of its parts. It is not so easy to decide whether our hypothesis is inconsistent with this requirement: a macro-representation of' a discourse is also based on the interpretation of its parts, viz. its sentences. Typically 'semantic' categories like Agent, Object, Event or Action, etc., do not necessarily dominate 'words' or concepts, but surely also propositions, as is already the case in classical transformational grammars where S-nodes arc recursive. Similarly, those categories may dominate *sets of propositions*. Intuitively, as we mentioned earlier, the Agent of the discourse may be identified by a set of propositions, and the same holds for an Event. The formal problem is, however, that we do not simply need a set of sentences to identify, e.g., the Agent, but parts of the sentences of that set. That is, we must 'extract' from each sentence precisely the information relevant for the identification and construction of some macro-category. This may all be very plausible, e.g., in the perspective of cognitive processes, but it is pretty vague. What we need are the rules to do the operations described.

5.3 What is the moral of these general remarks for the grammaticalness-acceptability discussion'? Clearly, what we want is that the grammar predicts that certain utterances are unacceptable because of a violation of macro-constraints. Let us give a concrete example to illustrate this point. Consider the following discourses:

(21) A: Did you hear about the bank robbery?
B: No, what happened?
A: Yesterday morning 1 was at our bank round the corner. Suddenly, one of the clients took a gun out of his pocket. He shot a couple of times in the air and then aimed at the cashier. He said that he wanted all the cash she had in her desk. She was very frightened and gave it to him. Then he ran away. The police have not yet caught him.

(22) Suddenly, one of the clients took a gun out of his pocket. She was very frightened and gave it to him. The police have not yet caught him. Yesterday morning I was at our bank round the corner (...)

(23) Yesterday morning I was at our bank round the corner. The bank is a terrible building. The buildings in this part of town are horrible. But I like living here. The town has no industry. My brother works in a factory. His boss is a terrible guy. He was born in New York in 1909. At that time you could still live in the city (...)

Intuitively, we find (21) an acceptable conversation (apart from some stylistic aspects and elements of spoken language, neglected here) and A's narrative acceptable. In (22), however, the order of the sentences of that narrative has been changed, which clearly makes the discourse not only ungrammatical at the semantic level, i.e., incoherent, but also unacceptable: the linear referential relations are mixed up. Discourse (23) does satisfy the constraints for linear coherence: each sentence has a semantic link with a previous sentence. Still, we would hardly consider it acceptable: there is no 'point', 'line' or 'theme' in it, and we would probably qualify it as pathological. In other words, there is no macro-model in which in each sentence can be interpreted: the relations between the (micro-)models in which the sentences are interpreted exist but are fully arbitrary. Discourse (23) would at most be a collection of the topics talked about during an informal conversation. In case the grammar would be able to formulate the macro-constraints, it would be able to predict the differences in acceptability of (21) and (23).

Notice, also, that macro-structures may have direct 'linguistic' relevance: in (21) A's question is about a bank robbery, and the narrative he gives in his reply is about the robbery. But the term 'robbery' itself does not appear in the narrative and yet B knows that the proposition of A's question and the meaning of the narrative have the same referent, viz. some event which may be characterized as (YESTERDAY) (ROB) [SOMEBODY, (OUR) (BANK)]. Hence, macro-structures may be directly expressed in surface structure. A macro-semantics should specify the specific relations between such a sentence and the global and specific meaning of the discourse. That such relations exist may also be concluded from the fact that a sentence like 'The bank was *not* robbed' Would be inconsistent with the narrative discourse, even if it is not strictly inconsistent with any sentence of it. The inconsistency, then, can only be explained between the sentence and the underlying macro-proposition of the discourse. In other terms, the whole ordered sequence of sentences of the discourse *entails* 'The bank was robbed'. Even if a macro-structural component in the grammar is superfluous, the semantics should provide the rules specifying why this sort of entailment may be true or false. Similarly, at the empirical level, the grammar should account for the fact that native speakers can make such conclusions, identify the equivalence relation in a conversation like (21), and detect inconsistencies between sentences and whole discourses. These are only a few of our semantic abilities.

The conclusion from these arguments and examples seems to be that the phenomena involved are directly relevant to a theory of grammar and that therefore it seems warranted to look for a solution of the puzzles mentioned in section 5.2.

6. DISCOURSE AND COGNITION

6.1 Since only some of the formal problems involved in pragmatically based discourse grammars can be solved at the moment, it is important to investigate the empirical foundations of such a grammar. More specifically, we want to know which cognitive structures and processes are involved in the production, interpretation, storage, retrieval, recall, recognition, etc., of such complex verbal utterances as complex sentences and discourses. Are these cognitive processes fundamentally different from those operating on simple sentences? Is it possible to make a distinction between perceptual, interpretative and productive strategies on the one hand and rule-based operations on the other hand?

6.2 Independently from work on discourse in linguistics, such and similar questions have recently attracted the attention of psycholinguists and cognitive psychologists. Since the early explorations by Bartlett (1932) on memorization of stories, a number of interesting experiments have been carried out on discourse material. Because no explicit grammar or cognitive model for the processing of such material was available, most of the experiments were based on intuitive analytic categories and procedures. Some of the major findings and assumptions of this work will be briefly given here. It is clear that such results can be considered as arguments in favor of a text grammar, in particular of the macro-structure hypothesis, onlt if it is agreed that an adequate grammar must provide the 'closest possible fit' to the systematic phenomena of verbal behavior.

6.3 It is well-known that early experimental psychology of language behavior very often made use of nonsense material to test learning, recall, etc. Together with a general reaction against behavioristic approaches to natural language, mainly initiated by Chomsky and Miller around 1960, the nonsense and word-list material was gradually replaced by sentences. In this research one of the major goals was to find psychological evidence for particular grammatical rules (transformations), e.g., by testing reaction times. The hypotheses involved there, however, turned out to be overly optimistic: there is no direct relation between particular rules and regularities in test behavior. Bever (1970), in his article referred to earlier, demonstrated that much of our verbal behavior is based on cognitive strategies which need not run parallel to the rules and their operations as provided in the grammar.

At the same time the interest in learning the recall tests shifted to semantics. It was pointed out that surface structure of sentences – or syntactic structure in general -- is not learned and only fragmentarily recalled or recognized: information processing is based on underlying semantic structures. The memory models involved, hence, became 'semantic' or 'conceptual', constructed out of propositions (with their case structure represented in a tree graph, for example) or networks (for discourse representation, see, e.g., Kintsch 1974).

6.4 It is against this background that recent research on discourse must be viewed. Even if discourse material was used, this was often not to test learning or recall for complex material as such or for the rules or constraints underlying it, but to get insight about 'contextual cues' in learning sentences. In other discourse experiments the tradition goes

back to Bartlett's work. Having a story reproduced several times (often a very long time apart) after presentation, he found that the exact words, phrases and sentences were not recalled in the later trials, and that in the long run only some 'outline' of the story, perhaps together with some striking detail, was recalled. New detail may reappear if consistent with, or inferable from, that outline. The main hypothesis, then, is that recall is essentially *constructive*, i.e., in perception and storage a basic structure, a *schema*, is formed upon which detail of the original input or new (added) detail can later be recalled. The core of our processing of complex structures like discourses is obviously such a scheme. It was further found that elements in the discourse which could not easily be understood were transformed (by reduction or further explication) to more explicit or better-known structures (rationalization). Finally, it was found that the inference and rationalization procedures, the construction of schemata, and the recall or addition of detail were strongly dependent on personal interests, attitudes and feelings, and on social conventions. Similar conclusions were drawn from experiments with serial reproduction of discourses by various subjects after each other.

Paul (1959) replicated some of Bartlett's experiments in a more sophisticated way and arrived at similar conclusions. In general, discourses which are relatively 'explicit' are better recalled than their 'obscure' counterparts, where coherence must be established by the subject through inferential steps not presented in the text itself. However, this facilitation is more marked for unfamiliar material: we have no difficulty in supplying inferences in discourses about topics we know rather well. In repeated serial reproduction the more familiar and the more explicated texts remain coherent, even when 'skeletonized', which may not be the case for relatively difficult, obscure or unfamiliar material. One of the explanations is that schemata can be constructed more easily when related to schemata already present in memory. Other differences in task behavior are based on differences in cognitive style of the subjects: some subjects look for the global meaning (forgetting detail, and hence importing new detail in recall) whereas others are interested in specific details, being less able to construct a more generally coherent pattern. But, as was already demonstrated by Cofer (1941), recall of ('logical') ideas is always better than verbatim recall.

Further detail in this direction was supplied by Gomulicki (1956), who showed that the recall of elements of a passage is directly proportional to 'its contribution to the total meaning of the passage'. Apparently, during interpretation, special mnemonic processes operate such that relatively 'important' concepts are abstracted from the material. Thus, in

a narrative, Agent and Action are more important than descriptive elements. More generally, our recall for events and actions is better than that for states, scenes or object properties. Such phenomena may be explained – Gomulicki did not provide such explanations – by the fact that events and actions are better 'organized', i.e., temporally and causally ordered, than, e.g., scenes.

Similar results about the abstraction of important concepts from discourse material were obtained by Lee (1965), who showed in particular that the organization of paragraphs and the presence of summaries, conclusions and title facilitate this abstraction process. The importance of titles in the interpretation of discourses was also demonstrated by Dooling and Lachman (1971) on material which was intentionally vague and ambiguous. Earlier, Pompi and Lachman (1967) and Lachman and Dooling (1968) had postulated the construction of 'surrogate structures', which need not directly depend on the words of the passage themselves, but which are a combination of theme, image, schema, abstract and summary. During encoding and reproduction such abstract categories serve as 'cores' around which individual concepts/ words, phrases and sentences are interpreted or produced. The assumption that reading and (re-)production of discourse are not only based on properties of isolated sentences has been demonstrated also in several contributions to the volume edited by Carroll and Freedle (1972), e.g., by Crothers, who identified the 'theme' with higher order nodes, and by Frederiksen, who showed that problem solving is based on 'superordinate (semantic) processing'.

One of the more concrete results in the investigation of the relations between grammar rules and memory processes was Slobin's (1968) finding that recall of passive sentences in discourse – and their storage as passives – depends on the degree of focus or importance of the (logical) subject of such sentences in the discourse: if that subject is unimportant or not specified at all, the sentences may be stored as (truncated) passives of which the subject is the 'logical subject' of the passage. This result is one of the examples where original coding hypotheses (complexity of grammatical rules entails complexity in storage and retrieval) had to be modified.

Bower (1974), finally, made a distinction between micro-structure and macro-structure of a discourse and showed that interference of interpolated details does not. improve recall of macro-structures but causes confusion in the recall of micro-structural elements. Macro-structures in this account are not well-defined and seem to be constructed of 'major categories' representing key events in the discourse.

6.5 Although the survey of some selected papers on the cognitive processing of discourse given in the previous section is very fragmentary and oversimplified, the main results seem to be consistent with our hypotheses.[8] However, a great number of problems have not yet had sufficient theoretical and empirical attention. For our discussion it remains to be demonstrated that the processes of abstraction (*cf*. Bransford and Franks 1972) and the formation of schemata or macro-structures are not merely cognitive strategies for the organization, storage and retrieval of complex information, but that such strategies presuppose the existence of grammatical rules. The inference processes involved seem to be based not only on inductive world knowledge but also on our knowledge of conceptual meaning structures, meaning rules and postulates of natural language. The structure of a macro-structure is thus determined by general semantic rules, identical with those for propositional structures: in interpreting a discourse we select the elements which may be the Agent, the Action(s), the Object or the Circumstances of the global meaning. Strategies and rules, just as for sentences, may not run parallel: the first Agent introduced in a story will as a hypothesis be taken as the discourse-Agent, but this strategy may be falsified by further information. Similarly, a conclusion or result of an argument or narrative may be given initially in the discourse, but the rules of macro-syntax/semantics will nevertheless assign the correct interpretation to such a discourse. Reordering of global segments of a discourse seems to follow the same rules as those for sentences. The interesting advantage of this hypothesis of the parallelism of structures and rules at the micro- and macro-levels is that we need only one set of rules and strategies to process both. The big problem remaining, however, is the formulation of the grammatical rules (and the cognitive processes underlying them) of *macro-interpretation*, taking concepts, concept clusters and propositions at the sequence level to concepts, concept clusters and propositions at the macro-level by abstraction, reduction ('semantic pruning') and generalization.

Although our – still not sufficiently explicit – hypothesis seems to have some 'holistic' properties characterizing much work in Gestalt theory, the underlying methodology is rather 'associationistic' according to the criteria set out by Anderson and Bower (1973). Macro-structures are not mystical 'emergent' properties of a discourse but are constructed on the basis of semantic properties of words and sentences. If a formal model of this construction can be provided we would have an explicit warrant for our main assumptions in this paper, viz. that the factual acceptability of sentences depends on their function in the discourse as a

whole and that the acceptability of discourses is based on the presence of a macro-structure defining its 'unity' and on the pragmatic function in the conversation. At this point the hypotheses put forward have their direct bearing on social psychology and sociology, since they specify the cognitive foundations of our representation of reality and the organization of interaction.

NOTES

1. For further references on discourse and text grammars, see van Dijk (1976c) and Petöfi and Rieser, Eds. (1973), and the bibliography by Dressler und Schmidt (1973).
2. See Schank and Colby, Eds. (1973) and a survey in Anderson and Bower (1973), Chap. 4.
3. We may refer to the exploratory work by von W right (1967) and further elaboration in Brennenstuhl (1974) among many other studies on action in philosophy and logic.
4. For a discussion on the logical constraints of connection sec van Dijk (1974c, 1976a), referring to recent work in relevance or conditional logics and their semantics.
5. We think of several directions of research here: philosophical by Austin, Searle, Grice and Schif7er, logical by Montague, Cresswell and Ballmer. linguistic by Bartsch, Kummer, Wunderlich, Karttunen, Sadock, Kasher, etc. For references, see van Dijk (1976b).
6. For an action theoretical explication of this assumption see van Dijk (1974b) in which further references on narrative research are given.
7. A collection of reviews on text grammatical work has been published by the Projectgruppe Textlinguistik (1974).
8. For further detail, see van Dijk (1975), in which a more precise theoretical analysis of the discourse experiments is given, as well as their consequences for a theory of text grammar. See also van Dijk and Kintsch (in press) for further references.

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