A Note on the Partial Equivalence of Text Grammars and Context Grammars

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One of the major arguments which have led to the attempted construction of so-called text grammars is based on the assumption that the notion of grammaticalness is not absolute but *relative*.[1] That is, a sentence can be characterized to be grammatical only with respect to an ordered set (possibly empty) of other sentences, preceding it in a "discourse". An adequate grammar may hence be required to explicate this type of grammatical relativity by formulating rules and constraints determining how the structure of sentences depends on the structure of the preceding (or perhaps following) sentences.[2] It has been shown that this sort of dependency is primarily semantic, whereas morphophonological and syntactical discourse constraints derive from the underlying semantic ones. The intuitive notion thus reconstructed is that of "coherence". The semantic discourse constraints at issue pertain both to "meaning" and reference, and can be made explicit in an appropriate model-theoretic interpretation of the formal language(s) of the grammar.[3]

Much broader attention has been paid in recent research in philosophy, logic, and linguistics to a more general type of grammatical relativity, viz., the relativity with respect to pragmatic *context*. Grammars accounting for pragmatic constraints may therefore be called "context grammars".[4] They

[1] The concept of relativity" in linguistic theory appears in several recent studies, especially in connection with treatment of presupposition. See Lakoff (1971), Karttunen (1973a: 185; 19736, and other writings; his 1973b comments on Thomason's paper [1973] who, in the current logical discussion on contextual constraints on truth-value assignment, discusses the boundaries between semantic and pragmatic presupposition). See also Kasher (1973).

[2] For numerous references to work on text grammars, see van Dijk (1972a) and Petöfi and Rieser (1973).

[3] An interesting example of such a formal semantic treatment of textual relations is provided by Ballmer (1973).

[4] For the notion of "context grammar", see van Dijk (1974a), as well as the references to other pragmatic work given there, which cannot be accounted for in this short note. For a

are required to specify, recursively, the infinite set of possible contexts for utterances of a given language, i.e., the conditions under which utterances may be said to be "appropriate". The formulation of such appropriateness conditions is at the same time an explication of the philosophical notion of a happy illocutionary act. Context grammars should account for how the surface structure, the meaning, and the reference of (uttered) sentences is determined by specific properties of the context, such as its topological structure (place and time of the utterance-act) and the mental structures of the speech participants: knowledge, belief, intention, preference, ability, etc.

Although both text grammars and context grammars are far from being explicit and complete at this stage of research, there is an important methodological point in comparing them, even in an informal way. The fact that many linguists have always, though often implicitly, considered discourse – and hence discourse constraints – to be part of the context (where context was thought to belong to the domain of performance, however), suggests the possibility that *text grammars are equivalent, at least partially, to context grammars, or may even be reduced to these*. In that case, the context grammar would be a context-sensitive sentence grammar if all relevant discourse constraints on sentence structure and interpretation can be formulated in terms of preceding uttered sentences and the corresponding mental structures of speakers and hearers. It will be argued below that, although some text constraints may have the same influence as some context constraints, we must assume that utterances are not merely uttered sentences, but also uttered texts. In other words: context grammars must be based on (i.e., include) text grammars, not sentence grammars.

Without adequately formalized grammars it is of course impossible to give a formal proof with respect to their comparative strong or weak

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serious formal treatment of pragmatic aspects of sentences, viz., in the form of a model theoretic semantics for explicit performatives, see Aqvist (1972). For collections of recent work in the domain see Bar-Hillel (1972) and Schmidt (1974). Roughly, our view of pragmatic theory and its tasks is close to the work of Kummer (e.g., Kummer 1973).

The notion of "context" used in this paper – which is not here defined – differs from other uses of the term. In the first place it should not be identified with the performance notion of "situation," which is more general and less abstract. Many linguists simply count (preceding parts of) discourse as belonging to the (verbal) context. In recent discussions this notion of context is often more narrowly restricted to a set of sentences, being true or presumed to be true, at the moment of utterance. In that case such a set would represent an epistemically accessible possible world obtaining at the moment of utterance. Without being explicit, we could view a context statically or dynamically, viz., as an (initial) state description or as a process description. In both cases this description would pertain to the states of the speech participants (speaker, hearer) – internally (wants, preferences, intentions, knowledge, belief) and externally (topological, actional) – and to the utterance itself. Hence a context is an ordered subset of possible worlds (situations), selected by partial characterizations of some "speech" individuals and events, viz., those which are relevant for the syntactic and semantic structure of the uttered discourse.

generative capacities. The arguments for or against the reduction hypothesis formulated above – viz., that text grammars may be reduced to context-sensitive sentence grammars – are merely informal preliminaries for such proofs. From a serious reduction proof we may at least require the satisfaction of the following conditions:

1. it must show that all relevant grammatical discourse constraints on sentence structure and interpretation can be formulated entirely in terms of context description (i.e., in pragmatic terms);

2. it must show, conversely, that there are no pragmatic constraints having (parts of) texts/discourses as their scope.

Any argument in favor of the reduction hypothesis of course presupposes that (1) sentence grammars are somehow simpler than text grammars (i.e., have fewer rules, categories, and constraints); (2) a grammar must account for relative grammaticalness on all levels of description; (3) it is a theoretical task of the grammar to specify the structure of contexts, i.e., to formulate appropriateness conditions for utterances.

A first argument partially satisfying condition (1) runs as follows: (PRO 1) The textual constraints on (in-)definite noun phrases and determiners are equivalent with epistemic constraints on the mutual knowledge of speaker and hearer with respect to the existence of referents.

This argument holds for two reasons. For example, take a sentence like *He arrived at 5 o'clock*, or a sentence like *The man arrived at five o'clock*. In both cases, the intended referent may be appropriately identified, by the hearer, through, e.g., visual perception (presence of the referent in the direct topological neighborhood of speaker and hearer). The other possibility is that the speaker knows which referent is intended by the appropriate interpretation of a previously uttered sentence introducing the referent (normally with an indefinite noun phrase). That is, previously uttered sentences normally change the context by changing the epistemic and doxastic sets of the hearer and – correspondingly – those of the speaker with respect to the state of knowledge of the hearer.[5] How the hearer acquires his information does not seem to affect the structure of the given sentences. Hence, a sentence grammar specifying structure and interpretation conditions for these sentences and those of the preceding sentences, together with pragmatic constraints providing epistemic conditions with respect to intended identical referents, would do the job. The set of previously uttered sentences (if any) is in this case simply to be understood as a subset of the presuppositon set of a given sentence, in the pragmatic (epistemic) sense of presupposition.[6] In other

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[5] This point has also been made in a paper by Isard (1973).

[6] See the references in note 1. From our discussion it follows that a presupposition set, as assumed by Karttunen and others, must either somehow be structured (ordered) or part of

terms: definitivization and pronominalization are surface operations determined by pragmatic conditions for sets of uttered sentences and not by semantic conditions for (uttered) discourses.

Argument (PRO 1) has a number of serious drawbacks, however. In the first place, it seems to imply a different account for definites and pronouns in discourses on the one hand and in compound sentences on the other hand. In the latter case we may not properly speak of pragmatic constraints based on previously uttered sentences, but would be obliged to speak of previously uttered clauses. The phenomenon of backward-pronominalization (under the Langacker restrictions') would go unexplained in that case since the condition of "commanding" is syntactico-semantic and not pragmatic (CONTRA 1).

A second problem is the condition for pronominalization requiring lexical identity – at least under a substitution view of pro-forms. Again. such a condition can hardly be formulated in pure pragmatic terms (CONTRA 2).

However, this last counterargument forces us to adopt auxiliary explanations for the indexical pronouns, which do not have their origin in lexical identity but rather seem to have a demonstrative character (PRO 2). At this point the distinction between semantics and pragmatics is blurred. On the one hand we may treat indexicals semantically, where reference is a function to specific contextually determined individuals. On the other hand we might conceive of both cross-referential and indexical pronouns, in their *use*, as manifesting an *act* of referring, and hence treat them in the pragmatic component of the grammar.[8] Current semantics usually abstracts from this pragmatic aspect of reference – which would require an analysis of "intending" or "focusing" as mental

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what it performs theoretically must be accounted for in a semantics of discourse. The idea of a "presupposition (or data) set/base" has been used by other authors as well, e.g., Bartsch (1972). Stalnaker (1973), also using a similar construct, localizes it completely at the pragmatic level, viz., as a set of speaker-assumptions.

Although the different treatments are converging on some very important properties of natural languages, none of the mentioned articles gives explicit elaboration of such adopted concepts as "presupposition set" or "context". A possibility remaining undiscussed in this paper is a sort of converse reduction hypothesis, assuming that presuppositions, as well as the whole context in the form of a maximally consistent (?) Henkin set describing the context, may be accounted for in a text grammar, thus reducing all pragmatic determinants to those syntactic and semantic expressions and their interpretations of the language itself. Although such a hypothesis is interesting and although we do not have at present enough insight into the implications of such a proposal, based on the philosophy of expressibility (defended, e.g., by Searle 1969), it may be assumed that such a procedure is reductive in the wrong sense, because it would not meet the basic tasks of pragmatic theory, which is not to define truth for sentences but appropriateness for utterances.

[7]   See Langacker (1969) for these constraints and the discussion in van Dijk (1972a: Chapter 2) where it is argued that backward pronominalization is transformationally derivative and requires ordinary precedence relations.

[8]   A See Cohen (1970) for the view that "referring" as an act should be treated as apart of our linguistic competence.

acts – but further reconstructs adequately, at least for some restricted formal languages, the intuitive idea of reference involved.[9] For our arguments, thus, the whole issue does not seem very decisive pro or contra the reduction hypothesis. "Identity of referents" is a condition perfectly accountable in a semantically based text grammar, whereas "knowledge of intended (referent)" requires a pragmatic analysis of uttered sentences.

Any serious argument against the reduction hypothesis must obviously be based at least on the following criteria: first, in order for a given sentence to be generated, certain sentences must necessarily precede it and, second, these preceding sentences may not form an arbitrary set but must form, together with the i-th sentence following it, an ordered i-tuple of a specific kind.

Taking up again the example of pronouns, definites, and similar structures, it is clear that reference to all those referents that are not topologically present in the context and a *fortiori* all intensional objects require introduction by way of language. We may refer, with definites or pronouns, to some nonparticular millionaire Mary wants to marry, only by first introducing this individual existing in a world compatible with (accessible to) Mary's intentions in an appropriate preceding sentence.[10] Now in order to satisfy the second criterion, this preceding sentence may not just be any sentence. In order to correctly identify the intensional referent there must exist a semantic *connection* between the models in which the two sentences are interpreted, e.g., by letting domain of individuals intersect (such that this intersection has just one element, say). Let us give an example. Take the following discourse: *Mary doesn't want to marry Peter. She wants a millionaire. Let's hope he wants her.* In this case he in the third sentence refers to the intensional millionaire and not to the (actually existing) Peter introduced by the first sentence. The order of preceding sentences is obviously crucial here, as well as their interpretation. Hence an unordered presupposition set epistemically induced by "independently" preceding sentences cannot do the job. Any set of sentences with the syntactic and semantic constraints formulated above is a grammatical text, so that the pragmatic grammar accounting for the correct interpretation by a hearer cannot be based on a grammar generating isolated sentences (CONTRA 3).

Although playing an important role for textual coherence, nominals are not the only category requiring structural information from preceding sentences. By their very formal nature connectives mostly require preceding clauses or sentences. We cannot start a conversation, it seems,

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[9] For current work in logical semantics of natural language referred to here, see Harman and Davidson (1972) and Hintikka, Moravcsik and Suppes (1973).

[10] For a discussion of these logical aspects of identity and reference in texts, see (among other papers) Kummer (1971), van Dijk (1973), and Ballmer (1973).

with such expressions as *furthermore, however, on the contrary, moreover, yet*, etc. Although some pragmatic conditions with respect to normalcy-expectations of the speaker/hearer are involved (e.g., for causals and contrastives), the main rules involved are semantic and have ordered *n*-tuples of (sequences) as their scope. In many cases, even the connectives do not form ordered pairs of sentences, but pairs (triples, . .. *n*-tuple ($n > 0$) of propositions, manifest in an *m*-tuple ($m > 0$) ot *however* may stand in contrast to a whole stretch of preceding discourse (CONTRA 4).[11]

Still more problematic for a pragmatic sentence grammar would be the account of certain *self-referential indexical expressions* referring either to the whole discourse, to preceding parts, or to following parts of the discourse: *below, above, hereby* (which does not refer necessarily to an uttered sentence, but may introduce a long declaration), *in this* (paper, article, etc.), etc. A similar role is played by some verbs, auxiliaries, and tenses, such as *follow, precede, I argued or will argue, resume*, and expressions like *in other words*. In all cases, such expressions do not refer to uttered (surface) forms, but to propositional "content" of a part of the discourse or to its style, and hence require treatment in the semantics of a text grammar (CONTRA 5).

Another striking argument against the reduction hypothesis, closely related to (CONTRA 5) is the use of *performatives* themselves. That is. we here touch the second requirement to be fulfilled by a reduction proof. viz., to show that performative constraints do not have discourses as their

There has been an implicit tendency to relate speech acts to uttered sentences. There is, however, little systematic evidence for such a view. First of all, a complete speech event may comprise a whole dialogue, in which different illocutionary acts are involved and of which the structural unity is based on semantic coherence criteria for discontinuous texts. Second, a single illocutionary act – assuming we have serious methods for the delimitation of such acts – may have several uttered sentences or even the whole utterance as its scope. An assertion, a request, a command, a promise, words of advice, etc., are thus defined with respect to an *n*-tuple ($n > 0$) of propositions, manifest in an *m*-tuple ($m > 0$) of sentences, satisfying the pragmatic conditions of each illocutionary act. Thus I may promise (to do) p1 and p2 and ... pn, or p1 V p2 V ... pn. It may be questioned whether such pragmatic formulas imply a conjunction or disjunction of promises, since it may be maintained that in the first case

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[11] An attempt to give some semiformal semantic conditions for connectives has been made in van Dijk (197db), in which numerous references can be found to the current logical work on connectives and on the problem of connection and relevance between formulas in general, especially for conditionals of different strength (counterfactuals, entailments, etc). In this work, too, the notion of "context" or "circumstances" in logical theory becomes increasingly important. See especially Aqvist (1973) and Lewis (1973).

only one illocutionary act is involved, not n. Third, since illocutionary acts, (i.e. propositional attitudes) are based on propositions, it is also possible, and usual, to have more than one such act accomplished by the utterance of a single (complex) sentence. Thus the utterance of a sentence *like "Although I have a headache, I'll help you to solve your problem"* is both an assertion and a promise (CONTRA 6). However, although we see that the function from speech acts to sentences is not one-one, we might introduce the notion of a *macrospeech act*, for reasons parallel to the introduction of the notion of macrostructure in text grammar.[12] That is, it may be the case that an utterance as a whole, although including, *locally*, several microspeech acts, say as a type of subprogram, has the function of one global illocutionary act. In the example above, this would be a promise. A long request may contain several assertions, e.g., as motivations for the request, but nevertheless as a whole have the function of a request. It might well be the case that the assumed macrostructures of a discourse thus receive additional confirmation from the pragmatic level. A macrospeech act would in that case be a function from a given context structure to the set of macropropositions of an uttered discourse. If this assumption can be made explicit we would here have a decisive argument against the reduction hypothesis, because even when sentence grammars would claim to be able, in principle, to generate ordered *n*-tuples of sentences, they would (at least in their present form) not be able to generate macro structures. Since certain pragmatic phenomena require such macrostructures as their scope, a context grammar must be (include) a text grammar (CONTRA 7).

The last argument is, as far we are concerned, of very remarkable interest for the explanation of a series of major problems in linguistic and cognitive theory. It is a well-known fact in cognitive psychology that all complex behavior is programmed on the basis of *plans*.[13] These plans have a global character and direct the well-ordered and functional execution of mental and bodily acts toward a certain goal. The same must hold for the accomplishment of illocutionary acts. The central, global aim of such an act is to cause a change in the internal knowledge and preference sets of the hearer (leading eventually to the formation of intention to act in a certain way). In order to attain that goal, a speaker may have a complex illocutionary strategy at the "micro" level. Such lower-level acts may then become functional for higher-level acts. Such assumptions,

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[12] For the notion of "macrostructure" see the informal treatment in van Dijk (1972a: Chapter 3) and van Dijk (f972b).

[13] The importance of the cognitive concept of plan – see Miller, Galanter and Pribram (1960) – in linguistic theory was stressed early by Miller and Chomsky (1963). A *fortiori* such a concept is important for the explanation of our ability to produce and interpret such still more complex units as discourses. At the level of linguistic actions, we are thus able to relate macrostructures of texts with macrospeech acts of contexts. See Nowakowska (1973) and the discussion in Kummer (1973).

although briefly and vaguely formulated here, find confirmation in psycho-linguistic research. It is known that we are normally unable to memor-ize a longer utterance in all syntactic or even semantic detail. We mentally summarize and abstract from the set of propositions – depending on our knowledge, preferences, and interests of a given moment – by forming macrostructures. For pragmatic theory such cognitive evidence implies that the speaker of a longer utterance cannot possibly intend (at least appropriately, i.e., with some positive effect) that the hearer "know" all propositions manifested in an uttered discourse. At least, this "knowledge" is intended to have a short-term character, and is intended to construct a more global point or theme of the utterance. This requires in the theory a weighting procedure with respect to the "importance" of certain propositions. The usual pragmatic formulas like "Speaker intends hearer to know/believe . . ." thus become more complex when macrostructures and macro-acts are to be accounted for. The very existence of per-formative verbs like *resume* or performative adverbs like in *brief* or *briefly* is an indication for the actual relevance of macrostructures in actions and discourses. It has been shown above that for a serious treat-ment of the "unity" of very complex illocutionary acts, we must assume that utterances are constructed at the syntactico-semantic levels as discourses, not as sentences. Conversely, taking utterances as uttered texts guarantees the *process*-character of the communicative event.

The few and informal counterarguments formulated above seem to point to a rejection of the reduction hypothesis. If the addition of a pragmatic component to the grammar is necessary, we must assume that such a grammar provides structural descriptions of texts (including, of course, sentences, i.e., assigning structural descriptions of sentences rela-tive to those for other sentences). In other words, to make a sentence grammar context-sensitive is descriptively insufficient because the struc-ture of previous sentences cannot be given in pragmatic terms; the previous structural descriptions must be connected in *one* structural description for the whole discourse. Of course, the names *sentence gram-mar and text grammar* are merely labels: we just have grammars. When grammars of the current generative-transformational type, based on explicit natural logics accounting for the abstract underlying structures interpreted in adequate model-theoretic ways, are able to characterize discourses, there is no need for specific *text grammars*, because they simply would be text grammars in the sense intended.

Very little is known at present about the precise relations between pragmatic and other grammatical structures. The very general discussion given above is meant as part of the methodological framework in which these relations may fruitfully be studied and as an informal refutation of the widespread conception of discourse/text as merely a pragmatic or even a performance entity.

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