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Keijser, C.E.

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FROM ACCENT TO TRANSITIVITY

CORNELIA E. KEIJSPER

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Introduction

Every linguist knows that the "psychological" subject (topic) of a sentence need not be identical to its "grammatical" subject nor to its "logical" subject (agens, actor): in The BUTler killed the DUCHess, where capitals indicate accent, the three types of "subject" coincide (i.e., the butler), but in The DUCHess was killed by the BUTler, the "grammatical" and "psychological" subject (i.e., the duchess) is not the "logical" subject, the butler being the agent; and in The BUTler did it, the "grammatical" and "logical" subject happens to be the "psychological" predicate, butler carrying the last accent of the sentence.

The recognition that "psychological", "logical" and "grammatical" types of content must be kept apart is important but leaves one big question unanswered: Why is it that they interact in so many ways?

For example, in The magician amused the CROWD (Berman & Szamosi 1972: 315) the placement of the last accent at the end of the sentence is associated with an agentive grammatical subject (the magician does something in order to amuse the crowd); nonfinal placement of the last accent, in contrast, is preferred in The show aMUSed the crowd, where the grammatical subject is likely to be nonagentive. The association is not obligatory (see Bolinger 1972: 640), but in The show amused the CROWD, for example, the subject tends to become oddly agentive or the accent is interpreted "contrastively" (Lee 1971: 178-179), viz. It was the CROWD that the show amused. This is quite surprising given the fact that accent is supposed to express "psychological" content (given/new, topic/comment, etc.), which at first sight has nothing to do with agentivity.

Other examples of this kind are given in Keijsper 1988 and will be discussed in the present article (see especially Part Two below). The interesting phenomenon which they reveal is that associations are not random but always tend in a certain direction: it would be distinctly odd, for example, if the accentuation of The show/the magician aMUSed the crowd associated with an agentive grammatical subject, and the accentuation of The show/the magician amused the CROWD associated with a nonagentive grammatical subject.

The explanation of the pattern requires the development of a framework and terminology whereby different types of content can fruitfully be compared and yet be kept apart. Such a framework must be "psychologically adequate" in a sense in which existing linguistic theories are not (and are not intended to be). In my view, explaining interaction phenomena amounts to solving an intricate problem of time. On the one hand, sentences are uttered and perceived in time, the information communicated
consisting, simultaneously, of a segmental stream and a suprasegmental stream (accent, intonation). On the other hand, however, speaker and hearer manage to disregard the temporal dimension of speech in their communication of complex projections of events taking place in time. How is this possible?

The present article is intended to answer this question, in principle, by proposing that during sentence processing two seemingly complementary notions of time and negation are used. As a result of this proposal my earlier attempt to deal with "psychological" content (Keijsper 1985) becomes part of a more comprehensive sentence-processing mechanism which will ultimately lead from the speech chain uttered in time to a complex projection of time, or vice versa.

Section One summarizes the reasoning which led to the proposals in Keijsper 1985 and to their present extension. Part One reformulates the main points of the second part of Keijsper 1985 (Section Two), gives some basic examples (Section Three), and discusses the logical endpoint of the 1985 model (Section Four). It appears that the possibilities of accent end at the point where one notion of time and negation gives way to another. Part Two (Sections 5-8) starts the investigation of that other notion and discusses a number of similarities and differences between, on the one hand, the functioning of accent and word order in its "psychological" use and, on the other hand, distinctions in "grammatical" and "logical" content ("transitivity"). For a full analysis of the content of a sentence we need both notions of time and negation, but they cannot be applied simultaneously, because they contradict each other. The conclusion is that linguistic theory can be improved by taking seriously the obvious truth that language is uttered and perceived in time.

1. Towards a two-phase model of sentence processing

1.1 "Psychological" content: Form-Meaning approach

The "psychological" area of sentential content is most often treated in terms such as Theme/Rheme, topic/comment, given/new, [-focus]/ [+focus]. From a Form-Meaning point of view this practice is unsatisfactory, because none of the terms used here represents a content directly expressed by some aspect of form.

To take only one set of terms, in the Prague School tradition the underlined part of the following sentences would be called a Theme, the italicized part would be called a Rheme; as before, capitals indicate
accent: john likes MARY; john likes MARY; JOHN likes MARY; JOHN likes MARY; john LIKES mary; mary john LIKES; MARY john LIKES; MARY JOHN likes; MARY john likes. As will be clear from these examples, an unaccented word can belong to the Theme as well as to the Rheme, an accented word can belong to the Theme as well as to the Rheme, the Theme can precede the Rheme, and the Rheme can precede the Theme. So neither accent nor word order directly conveys the message: “this is the Theme” or “this is the Rheme”.

Confronted with this complex relation between content and form, the best proposal within the framework of Generative Grammar (Gussenhoven 1983 and subsequent publications) has it that the linguist’s task consists in formulating the rules specifying the relation between content (Theme/Rheme, topic/comment, etc.) and form (accent, word order), i.e., predicting form from content:

```
CONTENT
  ↓
RULES
  ↓
FORM
```

In my view, this specification would provide the explanation if the occurrence of a given content were, in its turn, predictable, for example, from the context in which an utterance occurs:

```
CONTEXT → CONTENT
  ↓
RULES
  ↓
FORM
```
The literature on the subject (but not Gussenhoven's proposal) often suggests that accent and/or word order are indeed predictable in this sense; however, this idea can easily be disproved (see Keijsper 1982; 1985: 61-85; 1989). For example (Ebeling 1981: 18): *(How do you know?)* *I met Peter on my way home. HE told me about it.* Or: *He TOLD me about it.* Both sentences are correct and both create a coherent dialogue, but it cannot be predicted on the basis of the context which one will be chosen. Since in a given context various accent placements and word orders are often possible, the first arrow in the scheme given above, from context to content, must be eliminated. The improved scheme (in Gussenhoven’s proposal, for example) then starts from a given content and specifies which forms are related to that content.

By doing so, the scheme cannot, in my view, go beyond observational correctness (i.e., specifying which contents are related to which forms). Generative Grammar applies the term “explanation” to such a scheme, but this parlance is based on false reasoning (see Keijsper 1990).

The alternative Form-Meaning approach, in contrast, aims at an explanation of the relationship between content and form. It does so by distinguishing between two levels of content, viz. meaning and interpretation. A meaning is the content directly expressed by a form, without intermediating rules. The combination of a form and a meaning is a linguistic sign. Interpretations are variable readings resulting from the interaction of the various form-meaning complexes, both with each other and with the contribution of context and general knowledge. From this point of view, terms such as Theme/Rheme, topic/comment etc., are considered names of interpretational categories:

```
          MEANING
         /     \        /     \        /     \
        FORM     FORM     FORM
         \     /        \     /        \     /
         INTERPRETATION
```

The Form-Meaning approach to “psychological” content does not simply turn the Generative Grammar scheme upside down, it also adds the level of meaning. It is superior to the GG approach because the additional level of meaning explains the relationship between formal distinctions and interpretational ones. It also accounts for the fact that in a given
context various accentuations and word orders are often possible: it is the meaning of the accentuation and word order chosen by the speaker which tells us how the given sentence is to be embedded in the context:

\[
\begin{array}{c}
\text{MEANING} \\
\downarrow \\
\text{FORM} \\
\downarrow \\
\text{CONTEXT} \\
\end{array}
\quad
\begin{array}{c}
\text{MEANING} \\
\downarrow \\
\text{FORM} \\
\downarrow \\
\text{INTERPRETATION} \\
\end{array}
\]

The diagram given here is a static explanation model summarizing a Form-Meaning type of reasoning concerned with "psychological" content, viz. that used in Keijsper 1985, Part One, to show that existing approaches are defective and that an alternative must be sought. The invariant meanings which appear here do not pay attention to what actually goes on in the mind of language users during a speech act, as invariant meanings are supposed to do.

1.2 Beyond timeless meaning: sentence processing

So far, there should be no conflict between my treatment of "psychological" content and more comprehensive models based on similar Form-Meaning principles. Thus one would expect it to be possible to embed the proposal in such an overall model, specifically that of Ebeling (1978). However, attempts in that direction have been unsuccessful.

This is due to the fact that Part Two of Keijsper 1985 (summarized in Section Two below) goes beyond timeless abstractions: it strived to specify which mental operations performed on a speech chain uttered in time are relevant to the interpretation of accent, thus making it clear in which processing circumstances which interpretations arise. The original reason for doing so was, of course, the necessity to show that the meanings proposed do indeed account for the interpretational facts. However, the processing mechanism I came up with appeared to have certain theoretical implications of which I was not fully aware at the time: it is not semantically neutral ("meaning-preserving") but in comparison with a timeless-meaning notation such as Ebeling's (1978), it introduces a variation in what I now call negatability (see Section Two ff.).
I am now convinced that this is correct: accent affects only the negatable referent of words; therefore, the mechanism introducing variation in that referent must be described if one's aim is to predict the precise effect of accent in various circumstances: only the combination of the timeless meaning of accent and the processing mechanism can account for the facts.

In my view, the ability to introduce negatability variation during sentence processing is a full-fledged part of linguistic competence. On the level of timeless meaning, postulating, as a part of competence, a processing mechanism which introduces such variation has the effect of diminishing the number of timeless meanings one must postulate if one wishes to attain factual precision. For example, it would be impossible to cover all uses of accent by a single simple meaning if one omitted the effect on interpretation of the processing mechanism.

My present attempt to develop a more comprehensive framework uses this feature which was implicit in my 1985 approach: it consists in applying the “variation-creating” mechanism again, in such a way that a second “cycle” of negatability variation is introduced (see Part Two); the new cycle is well-known as it appears in other terms, such as “degrees of transitivity” (term borrowed from Hopper & Thompson 1980). By introducing a second cycle, “logical” distinctions, viz. “semantic roles”, acquire the same status as contents such as Theme/Rheme, topic/comment, new/old, [+focus]/[-focus]: they become interpretational categories (deriving from, most importantly here, verb meaning and the general meaning of grammatical predicativity). This idea is, of course, not new (cf., for example, Blansitt (1978: 313): “Semantic roles are etic, not emic”). But if this result is produced in the same way and in the same terms for various types of content, interactions between these contents can also be explained.

1.3 Two sorts of time

In the part of the mechanism relevant to the functioning of accent and word order in its “psychological” use, the processor uses mental “contraction operations” to eliminate the temporal dimension of the speech chain; he also computes the meaning of accent, which, in my proposal, takes time (other aspects of prosody will not be discussed here). In this phase, the sort of time which is construed as time, as something which is “always with us” (and which hence is non-negatable), is the sort of “discrete” time incorporated in the meaning of accent.

By contrast, the sort of “continuous” time in which participants exist, do things, cause each other to do things, etc., is embedded in elements
of the speech chain: accent can evoke a projection of the absence of the referent of these elements, so that the sort of time they refer to is negatable.

In other words, as far as accent is concerned, verbs (or other “grammatically” predicative elements), which are time-embedding elements, are elements of the speech chain like any other: they can precede or follow other elements, they can be accented or unaccented: they occur in time as elements to be operated upon by the processor. In this phase, the fact that the meaning of verbs also has to do with time is relevant only to the extent that in many languages it restricts the ordering possibilities of verbs (leading, for example, to the consistent end position of verbs - see 3.5 below).

Then, in order to construe the embedded notion of time as time (something which is “always with us”, i.e., non-negatable), the verb (or other “grammatically” predicative element) must be decomposed (expanded in time). But the processor can do this only by abandoning his struggle with the temporal dimension of the speech chain and accent; during this struggle he stores the information contained in sentence elements for later consideration. When he turns to the stored information, he enters the realm of “grammatical” and “logical” distinctions, viz. my second cycle of negatability variation.

Within the second cycle, too, the approach advocated here ultimately reduces the number of timeless meanings. For example, the various uses of the Russian reflexive suffix -sja can be covered by a single meaning (Gerritsen 1990) without loss of factual precision if it is accompanied by a classification of verb meanings along the lines suggested in Part Two below; these meanings then specify how the verb must or can be decomposed into “valences” during sentence processing, i.e., in time.

“Accent” time and “verbal” time mutually exclude each other, but word order has language-specific functions in both the “psychological” and “grammatical”/“logical” areas; these functions can be seen as subclassifications of the general negatability-reducing effect of speech-chain contraction (see Section Two below).

Associations and confusion between various types of content are due to the fact that the mental operations of the processor struggling with accent and the time dimension of the speech chain are very similar to events taking place on another scale in “verbal” time; in fact, they are so much alike that at first sight the processor’s mental operations upon the speech chain appear to be projections of things happening in “verbal” time. On closer inspection, however, one sees that the latter are expanded
out of the elements upon which the processor initially acts (see Part Two and notes to Part One).

1.4 Causal chain

The general idea of time embedded in time can be imagined with the help of the notion "causal chain" familiar from sentences such as *The general marches the soldiers*. Let us start with the "deepest" event. Imagine that you are watching the soldiers while they march: this act of projecting involves the ability to keep one's attention fixed on the soldiers for some time, so that one can see their marching.

In doing so, one does not see that the soldiers are marching as a result of a simultaneous action on the part of the general: when we are looking "inside" the result of the general's action we do not see the "causing" action. The latter requires another, "outside" perspective: one must view the soldiers' property of marching as something imposed from outside. But when one is thinking of the act of imposition, viz. the general's activity, one does not think of the property imposed on the soldiers as something extended in time, but rather as a thing, say a clock, imposed on them: it embeds time but is not construed as such if one does not "unroll" it in time.

In the same way, when one thinks of the general while he is imposing the property of marching upon the soldiers, one does not realize that there is somebody outside the general who is also acting: the processor of the sentence who, by performing mental operations upon the elements of the speech chain, creates the scene referred to, who imposes upon the general a "clock": the property of marching the soldiers. He does so in a time which does not exist for the general or the soldiers and which can be "seen" only by an outside investigator pretending to be able to look inside the head of the processor.

As long as the processor does not "unroll" his own creation in time, he sees the result of his own mental activities but not the "causing" activities themselves, as he cannot look inside his own head. Starting from this result, the "inside" perspective is arrived at by "unrolling in time" the property imposed on the general which, in its turn, embeds the soldiers' time. Shifting to the "inside" perspective, the processor eliminates himself as the causing force.

Crucial to an understanding of this chain is the fact that the "same" event can be construed both as an independent event and as a "caused" event, and that the way in which it must be construed is a full-fledged part of linguistic meaning. Thus, the subject-entity's "role" in the sentence...
The soldiers are marching is the “same” as the object-entity’s activity in The general is marching the soldiers. Nevertheless, the two differ linguistically: although the soldiers march in both cases, the sentence The general marches the soldiers conveys the additional information that they do so not on their own initiative but as a result of the general’s activity; that is, the sentence also construes the soldiers’ activity as a “caused” one. (In The soldiers are marching, the soldiers’ activity can, of course, also be caused by the general, but this is not indicated by the meaning of the sentence.)

In these terms, what I am proposing is that there is a “superimposed” cycle in the causal chain, viz. that of the processor’s operations upon the speech chain. In order to bring that cycle to light, the subject-entity’s activity in The soldiers are marching or in The general marches the soldiers must be construed as a “caused” one, with the processor of the sentence as the “causing” force. This construal differs from one in which the “same” events are construed as proceeding independently.

In my view, it is the view of the world as caused by the mental activities of the processor which must be taken if “psychological” meaning is to be described. The shift from this perspective to the idea that events take place independently of the processor (who then can only observe what happens, but not cause things to happen) is brought about by shifting to the “embedded” sort of time which is negatable as long as the processor deals with the speech chain and accent. For a full description of sentential meaning both perspectives must be analyzed.

1.5 Two worlds

Since the functioning of accent and word order in its “psychological” applications is based on the speech-chain-processing phase, without “unrolling in time”, or decomposing, the content embedded in sentence elements, the meaning of accent and, partly, word order is interpreted in a world which is created during speech-chain processing and is viewed by the creator; he sees the result of his own activities but not his own act of creation.

This strange world is a microscopic “quantum” world consisting of momentary things (“corpuscles”); with respect to accent and word order (in “psychological” function) referents occur rather than exist in time, because the idea of extension in time and space is still embedded in the result of processing. It is a “world” to the extent that it is the simultaneous result of the processor’s mental operations, i.e., something placed outside his own “clock” (just as the general imposing a property upon
the soldiers places this property outside his own "life"). But in order to turn it into the "macroscopic" world which, in our view, exists independently of mental operations, it must be looked into, i.e., the result must be further processed (just as the property imposed upon the soldiers must be expanded in time in order to see the soldiers' marching).

The "microscopic" world is that described in Kejsper (1985) and, with some corrections, in Part One below; my present aim is to show how it relates to the other - more common - "macroscopic" perspective which, as we saw in the general/soldiers example, can itself contain a further shift of perspective.

The "microscopic" and "macroscopic" perspectives are often confused, due to the fact that the mental operations of the processor which give rise to the "microscopic" world are repeated (on another scale) inside the world which the processor sees when he "unrolls" the world he has himself created; however, in doing so, he eliminates the effect of his own creative acts.

Thus what I am proposing here is that processing a sentence amounts to creating a world and then looking at that world in a way which eliminates the creator. In my view, the fact that numerous associations of the type mentioned in the Introduction and in Part Two below exist proves that this approach is liable to be "psychologically adequate". Needless to say, normal language users are not supposed to be aware of what they are doing.

1.6 Timeless meaning vs. processing

The simple idea sketched here requires a great deal of detailed investigations if interaction patterns between various types of content are to be described precisely. In the present article I shall not go into such detail. Instead, the discussion concentrates on the nature of the shift between the two perspectives I recognize and on the theoretical status of the whole enterprise.

As to the latter, if the analysis of the processing mechanism is reasonably complete, the approach advocated here can be compared to Ebeling's (1978) model, which is stated in terms of invariant meanings and invariant syntactic relations between them. The former set ("semantic particles") is open (at least, until languages have been described completely), but the number of syntactic relations constitutes a small closed set; thus, in Ebeling's model, the division between "semantics" and "syntax" is likewise invariant.
It is the latter feature of Ebeling’s model which clashes with my understanding of sentence processing: the essence of my “negatability-reducing” mechanism is that it varies, during sentence processing, the division between “mental operations” and “things operated upon by these operations”; that variation is not semantically neutral but affects the negatability of pieces of information.

Thus the degree to which the two approaches are compatible depends on whether Ebeling’s division between “syntax” and “semantics” is intended to imply a claim about what actually happens during a speech act. The crucial status of this question can be explained with the help of a simple example.

In Ebeling’s notation the meaning of the phrase white snow is “... snow - white...”, where “...” indicates that the representation here is incomplete, “snow” and “white” are semantic particles, and “-” is an invariant syntactic relation. The notation determines a set of appropriate referents for the construction, the relational symbol designating an instruction for an operation (Ebeling 1978: 208).

Finding a referent for the complex then consists of the following steps (ibidem): 1. “find the set of appropriate referents of “snow””; 2. “find the set of appropriate referents of “white””; and 3. “select from the set of appropriate referents of “snow” those members which are also members of the set of appropriate referents of “white””. The instructions implied in the “relata” (semantic particles) and in the “relation” (syntactic symbol) must be executed in the proper order (ibid.).

Now if executing the instructions simply means reading the notation (ibidem), i.e., verifying whether the notation does indeed determine the set of appropriate referents, no objections can be raised.

But I do not think that a hearer confronted with white snow actually goes through the steps implied in the notation, viz. applying a series of rules which assign linguistic forms to the mental representation of the sound string, timeless meanings to these forms, and projections of referents to these meanings (Ebeling 1978: 501): this would require an enormous amount of time, as much time as would be needed to make the detour via a timeless-meaning representation with a given (viz. Ebeling’s) fixed division between “syntax” and “semantics”.

However, this division is not directed by considerations of time economy, but by the wish to note down meanings with the help of a limited set of relation symbols; all aspects of meaning not covered by these “relations” can be written as “relata” connected to other “relata” by means of “relations”, which increases the computation time.
Furthermore, the representation disregards the hearer’s immediate time problem: he must take care that the elements “white” and “snow” are in mind simultaneously even though their sound correlates are uttered one after the other. In my view this requires time-eliminating mental operations.

In short, in my view, Ebeling’s “invariant syntax model” is inappropriate as an hypothesis of what happens during sentence processing.

But this model and my “variation-creating” mechanism are not incompatible if one recognizes that reading a timeless notation, and having all the time in the world to do so, is one thing, but processing in time a sentence uttered in time is quite something else.

Thus, in my account of the latter, a hearer starts with the immediate time problem presented by the speech chain with simultaneously realized accents, and ultimately arrives at a projection of an appropriate referent of the phrase white snow, in such a way that Ebeling’s “-” relation implicitly results from his operations; however, the relation does not in itself correspond to an operation and takes no time to compute.

The principle of how I believe this is done will be explained in the sequel. Here, it will suffice to say that Ebeling’s syntactic relations have nothing to do with the “arrows” which appear in my 1985 notation (see Section Two ff. below): the “arrows” are concerned with the immediate time problem disregarded in Ebeling’s notation but, in my view, essential to the functioning of accent.

However, the differentiation between timeless meaning and sentence processing does not fully solve the theoretical problem. First, as I said above, part of the burden of factual precision can be removed from the timeless-meaning level, i.e., the number of units on that level can be reduced by recognizing the existence of a negatability-reducing mechanism. More importantly, my approach raises the question of whether there are aspects of meaning which must appear as “syntax” on the timeless-meaning level. I agree with Ebeling that there are a few basic relations such as “is identical with”/“is not identical with”, and, for the speech-chain-processing phase, “is simultaneous with”/“is not simultaneous with”, but if these are meanings which must be stated on the timeless level, I would favour a “semantic” rather than a “syntactic” notation, so that the division between mental operations and elements operated upon can be introduced during processing.

The present article does not explicitly discuss Ebeling’s model, although it does incidentally draw comparisons with it, mainly in notes; I hope that it will nevertheless provide a basis for further discussion.
1.7 Concluding remarks

The order of presentation here is from the speech chain to a complex projection of time. This "hearer-oriented" order reflects the history of my research, but is not essential to the proposal. Ultimately, it should be possible to reverse the direction, viz. starting from a projection of something in the outside world which one wishes to convey by means of language (a "communicandum" - Ebeling 1978: 504), the projection is processed to the point where it directly relates to a speech chain uttered in time (which, in my view, takes things further than Ebeling's notation indicates).

Furthermore, the separate treatment, for expository reasons, of the two phases of processing (for both hearer and speaker) does not imply that in reality an entire sentence must be processed first in one mode, and then in the other; in fact, associations between various types of content show that the two proceed almost simultaneously.

Finally, as the reader will see, I am not dealing here with the time that linguists are usually concerned with, i.e., tense.
2. Some principles of speech-chain processing

2.1 Introduction

The elements of a sentence cannot be spoken and heard simultaneously. In the processing phase with which we are dealing in the present section, the hearer (processor) eliminates the initial temporal dimension of the speech chain and replaces it by the temporal dimension introduced by the meaning of accent. While he is busy doing so, he stores the information contained in the input chain, in order to return to it later. This later consideration is the next phase of processing: the present phase builds the "storehouse" for that further phase. The storehouse is the world ("world stack") created during the present phase; the next phase projects that world in a way that eliminates the effect of the present phase and reintroduces the time dimension eliminated in the present phase. Within the present phase, the processor has no knowledge of the world as it will ultimately be projected.

The rationale of this seemingly complicated procedure is the fact that the processor starts with a chain of forms extended in speech time, while he ends with a complex projection of a chain of referents existing and acting in time, i.e., having temporal extension. The former, however, is not an iconic reflection of the latter, but rather an unavoidable property of speech which must be mentally done away with. While the processor is busy eliminating the continuous time dimension of the speech chain, he cannot form projections of the same continuous sort of time in the realm of referents. Instead, he construes the world stack in the discontinuous, microscopic time introduced by the meaning of accent, so that he can subsequently form projections of the elements of the stack in continuous time.

The storage procedure will recur within the latter phase, as we saw in the example *The general marches the soldiers* discussed in Section One: it is a general procedure for mentally coping first with actions and then with their simultaneous results, without destroying the idea that the two are simultaneous. Here, the actions are the processor's mental operations upon the speech chain; the simultaneous result is the world stack created for further consideration. Thus the output of the present phase is an intermediate processing product.
2.2 Left-right ordering

The speech chain with which the processor starts has a continuous horizontal time dimension. Such a dimension is absent in the output of the present phase: the processor eliminates it, so as to reintroduce it in the next phase in the realm of referents. He does so by disregarding speech time below the word level and by contracting the speech chain into simultaneously present projections above that level.

Here, I will not be discussing units below the word level; just as the processor does, we divide the stream of speech into words (word forms), pretending that no time elapses between the beginning and the end of a word in speaking and hearing: only the result counts. This disregard of time defines words as mental states rather than as mental transitions between their beginning and their end; the extension of words in speech time does not count if we abstract from the process of word recognition.

The boundaries between morphemes in words do not correspond to mental operations during processing: we treat words as prefabricated units whose parts happen to follow each other in speech time. Boundaries between words, in contrast, do correspond to mental operations during processing, and these operations are relevant to the interpretation of accent, so that we cannot disregard them here.

The processor's mental life now consists of a sequence of mental states and the transitions between them. In one way or another, the information contained in the states must be retained over time: speech time must be counteracted mentally. In my view, the processor does so by - unconsciously - translating the transitions into mental acts which eliminate the time difference between subsequent states (contraction operations). The mental states between which the time difference is eliminated in this way can then no longer belong to the same sort of time as that in which they are nonsimultaneous; the subsequent mental states become projections which, as long as no accent occurs, are simultaneous in the time dimension introduced by accent (see below). I will call the resulting string of projections: the left-to-right order.

2.3 Accent

Simultaneously with the sequence of words, prosody is realized. The only prosodic phenomenon dealt with here is sentence accent. Unless accent is reinterpreted under the influence of the requirement that sentential coherence must be retained even where left-right contraction alone does not have this effect (see 2.9 below), it introduces a mental dimension
which in Keijsper 1985 I call projection time. It does so by performing a time-taking operation upon the projection corresponding to that (part of the) word on which the accent is realized, without using an additional position in the left-to-right order: if \( x \) is the (part of the) word on which the accent appears, an accent on \( x \) introduces a projection “not \( x \)” in the position of the left-to-right order otherwise occupied by “\( x \)” and negates this projection, which results in a projection “\( x \)” in the same position of the left-to-right order but in a different vertical layer:

\[
\begin{array}{c}
\text{projection time} \\
\text{left-right order}
\end{array}
\]

The diagram represents the processing effect of combining the timeless meaning of accent, i.e. “not not”, with “\( x \)”: one part of “not not” combines with “\( x \)” into a projection “not \( x \)”, and the second “not” becomes the mental act of negating “not \( x \)” (symbolized by the upward arrow from “not \( x \)” to “\( x \)”), so that another projection “\( x \)” results. The layers 1 and 2 are moments of projection time; the upward arrow from “not \( x \)” to “\( x \)” does not count as time (see 2.5), but ensures that the time we are dealing with is discontinuous: between two moments there is the step from one layer to another.

The accent diagram implies that during sentence processing no time is devoted to the act of combining the timeless meanings “not not” and “\( x \)”. If we combined the two timeless meanings, we would have some relation between the two, say, “not not \( x \)”, where “.” can be read as “is simultaneous with”. This relation would correspond to a mental act during processing only if it brought about a change in the processor’s mind, i.e., if “not not” and “\( x \)” were not simultaneous before the act and simultaneous after it (cf. contraction operations, which are mental acts for this reason). But accent is always simultaneous with the element on which it occurs, i.e., there is no change of the type indicated. The processor starts from the fact that “not not” and “\( x \)” are simultaneous and translates part of the complex into a mental operation upon the remainder: the arrow from “not \( x \)” to “\( x \)” in the diagram just given does bring about a change, i.e. it replaces the projection “not \( x \)” by the projection “\( x \)”.

In other words, the meaning “not not” is a timeless abstraction from what happens during processing, but not in itself a processed element. It will be clear that this saves time: the time embedded in “not not” is immediately “disembedded”.
The moment occupied by “not x” is defined by some other positive projection; otherwise, “not x” would be positive itself. In effect, an accent introduces one moment of projection time (the “x” moment) with respect to a moment given by another projection, in which moment “not x” is anchored.

The translation of “not not” plus “x” into
\[ \text{"x"} \]
\[ \text{"not x"} \]
is not semantically neutral: it turns the sort of “discontinuous” time embedded in “not not” into something which is “always with us”, which cannot be absent during speech-chain processing; even if words are unaccented, i.e., if the meaning “not not” is absent, the corresponding projections are in some moment of projection time, viz. in some moment introduced by an accent elsewhere. Thus an accent introduces a new moment of projection time, but that time itself is, in the present phase of processing, always there (non-negatable).

Projections corresponding to separate elements of the left-to-right order (see 2.5 for the other case) can only be in one moment of projection time or another, not in between and not in more than one; thus projections are, in the present phase, momentary, in that they are not “carried along” into subsequent moments.

The “not x” in the diagram represents the case which in Keijser 1985 I call “nonconcurrent negation”, viz. “not x” and “x” are in subsequent moments of projection time. Nonconcurrent negations give rise to “rhematic” accent interpretations: “x”, replacing its negation, is “new” information. The projection “not x” is a projection of the absence of x in the place of the world stack defined by the projection where “not x” is anchored. By replacing “not x” by “x”, with an assertive type of accent, the processor puts x in that place in the world stack.

2.4 Negatability, word order

However, accent affects only the negatable part of a word’s referent, i.e. “not x” projects the absence of what can be absent at the given point. Part of what may be called the maximal referent of a word can be construed as no longer negatable as a consequence of the context in which the sentence occurs (interpretational negatability reduction). More important here is that speech-chain contraction in the sentence itself reduces negatability, i.e., contraction is not a semantically neutral operation either: it introduces coherence at the expense of loss of negatable information.
For all the various ways in which the left-to-right order can be contracted (see 2.7-2.9 below), the constant general contraction effect is that the negatable referent of an element in final position is larger than the negatable referent of the same element in nonfinal position. This means that the speech chain is contracted from left to right, which is, of course, the obvious way to tackle the time problem.11

Consider, for example, the phrase white snow. The maximal referent of “white” is something₁ with the characterizing property /white/; the maximal referent of “snow” is something₂ with the identifying property /snow/. In the phrase white snow, however, the negatable referent of “white” is only the characterizing property /white/, and the negatable referent of “snow” is something₂ with the identifying property /snow/: the speech chain is contracted to the effect that “something₁” is skipped, the characterizing property being directly mapped onto the something₂ introduced by “snow”. This appears from the behaviour of accent: WHITE snow evokes the thought of the absence of the property /white/ but not of the absence of something₁ which carries the property. If, in Russian, for example, the order of adjective and noun is reversed, the (now final) adjective can include something₁ in its negatable referent; the negatable referent of the preceding noun is then only the identifying property /snow/ of the something₁ introduced by the adjective, i.e. the - now nonfinal - noun does not then introduce a something₂. This is also clear from the behaviour of accent. Thus the negatable referent of words varies with different word orders.12

Negatability reduction from left to right (the effect of contraction) is the general phenomenon underlying the various functions of word order; the general phenomenon must, in my view, be detailed in more specific meanings for different types of cases.13 Just as the meaning of accent, the meaning of a certain order does not itself enter the left-to-right order as a piece of information to be processed, as it is not expressed as an element of the speech chain; instead, it is translated directly into the relevant type of negatability reduction: the meaning is a timeless abstraction which costs no time to process.

The extent to which the speech chain can be contracted in the present phase is severely restricted by the requirements of accent: each element of the left-to-right order must have a referent negatable in the way required by accent, i.e., something which could be absent at the given point, be it only an identifying property. The most important implication of this is that the notion of extension (in time and space) must remain embedded (negatable) in the present phase: it involves a type of negation (changing
the extension of things) which accent cannot handle (see Section Four).

Furthermore, the decomposition of word-inherent meaning into semantic elements without a separate correlate in the speech chain plays no role in the present phase. This implies, among other things, that the meaning of verbs has not yet been decomposed into “valences”; the latter type of division requires further processing, of a type abstracting from the number and succession of elements in the speech chain (see Part Two below); here, the information conveyed by verbs is stored as a single whole.

As a consequence, differences such as that between John is a lawyer and John has a lawyer are invisible to accent: as far as accent is concerned, this difference resides in - i.e., belongs to the negatable information conveyed by - “is” and “has”, which are simply elements preceding and/or following others; their “explication” (leading to a different status of the referent of “a lawyer” in the two cases) is an issue for the next phase of processing; it cannot be dealt with in the logic of accent. Thus we can have dialogues such as - Is John a LAWyer? - NO, he HAS a lawyer, where the status of lawyer as “given” information is independent of the different status of its referent embedded in “is” and “has”; the “given” status is the same as in - Not YET, but he will soon BE a lawyer.

Information is embedded as long as the referent of the projection concerned is construed as negatable in the way required by accent, i.e., essentially, as something which can be added and removed vertically (but see 2.9 below for negation of concurrent negation). Maximally, the processor with a single accent operation adds to the world stack a momentary thing embedding various stretches of time; in that case (“highly transitive” verbs), it takes a lot of “unrolling” in the next phase before the ultimate picture of the world is arrived at. Minimally, he adds the identifying property of one momentary thing. If this thing is, for example, a characterizing property, it will, of course, disappear as a separate thing in the next phase; but accent works “microscopically”, the momentary things of the present phase being “potential foci of attention”.

The amount of information stored in the world stack by an accent operation varies, then, as a function of 1. the context (interpretational negatability reduction); 2. speech-chain contraction (final vs. nonfinal); and 3. the amount of information embedded in “x”, which differs for different sorts of word and their ultimate function in the realm of referents (attributive adjective, noun, noun functioning as subject/object, verb, etc.). The embedded information will come to light in the next phase of processing, where the momentary referents of the present phase are “unrolled” in time (decomposed).
2.5 World vs. mental operations, (non)coincidence

The functioning of accent and word order in "psychological" applications is based on the assumption that the processor determines what the world looks like and how it develops: the world we are dealing with in the present phase of processing is the simultaneous result of the processor's mental operations. It does not exist beforehand, unless part of it is construed as no longer negatable (pre-existent). As will by now be clear, this "caused world" will be eliminated in the next phase of processing, which transforms the "caused world" into a world construed as existing independently of mental operations; in that phase, referents are no longer negatable, whereas projections of these referents can be absent, i.e., that phase reduces negatability further, in such a way that the processor disappears as creative force. Although the "caused" world of the present phase is, then, only an intermediate processing product, it cannot be skipped, because it is the only world accent recognizes (see Section Four and the end of Section Three for borderline cases).

Although this world is a creation of the processor's mind, it is imagined outside that mind (as a "world"), because on the one hand, the processor performs mental acts, which, hence, belong to his mental life, while, on the other hand, these acts (the "arrows") do not count as time: the contraction operations upon the speech chain eliminate time, and the accent arrows introduce moments of time but are not, themselves, moments of time. This conflict, viz. acts which cannot be imagined outside time, while that time does not exist for the result of the acts, is resolved conceptually by placing that result outside the acting mind. As we will see in 7.9, this procedure recurs in the second phase of processing.

The "caused" world may be thought of as a vertical sequence of momentary things ("corpuscles") and layers ("world states") looked at from above: the processor's eye is static, looking only "in depth" (see 2.11 below for the difference between depth and time in the microscopic world of accent). Things which have not yet been added to the stack do not exist; things which are added by an accent operation are "new" (come into existence); things which are construed as having already been added to the stack are "given" (no longer negatable). The fact that when negatability is further reduced (in the next phase) the entire world of accent is unreal, plays no role: accent does not recognize that point of view, as the time which is needed for seeing it is not construed as time.

Thus, as far as accent is concerned, the "caused" world is real. Given this point of view, there can be, and, in fact, there is, an opposition between accent operations which are evaluated as merely mental opera-
tions, i.e. which change only the projection of the world, and accent operations which simultaneously change the world, i.e., which are not evaluated as merely mental operations.

The accent operation replacing “not x” by “x” in another moment of projection time is only a mental operation if the thing/layer to which “not x” pertains is still projected when “not x” is mentally replaced by “x”. “Not x”, as we saw, refers to the absence of x; x is always absent somewhere, i.e., “not x” presupposes another - positive - projection. When this “place” is kept in mind while “not x” is replaced by “x”, the accent operation only “fills in” the given thing/layer; the thing/layer concerned does not belong to the negatable referent of “x”. The thing/layer whose projection is “held” never corresponds to a separate element of the left-to-right order; otherwise, the projection could not be taken along to the next moment of projection time (see 2.3 above)\(^4\); it is a projection of a nameless, unidentified point of attention. This possibility is referred to as “noncoinciding projections” in Keijsper 1985, i.e., the mental step from one moment of projection time to the next is not accompanied by a time step in the world stack. In this case the accent operation is evaluated as merely mental because it delegates to the past only the projection “not x”, but not the projection of the thing/layer to which “not x” pertains.

Noncoincidence has two variants, depending on what “x” is: if “not x” and “x” pertain to the same momentary thing, then “x” gives the identifying property of that thing (the thing itself being excluded from the negatable referent of “x”); if “not x” and “x” pertain to the same world state (the world at a given moment), the accent operation adds a momentary thing but not a new world state. These two differ in their effect on the scope of accents (see 2.7 ff. below for this notion): in the first case, surrounding unaccented elements are not included in the scope of the accent on x, because the accent does not add a new point of attention (it fills in a given one); in the second case they are included.

Noncoincidence is available as a general “emergency procedure” if during processing a time conflict arises; it is used for the correction of earlier information (I say x, not y; or not x, but y); this is the “normal” interpretation for last accents on some types of word, notably first and second person pronouns and quantifiers. The “world state” variant occurs in NOUN Verb as opposed to Verb NOUN (in Russian, for example); here, it is the negatability-reducing effect of contraction. Finally, one type of speech-chain contraction (a so-called parallel link - see 2.8 below) is
based on noncoincidence (of either variant). For basic examples see Section Three below.

The accent operation replacing “not x” by “x” is not merely a mental operation if the step from one moment of projection time to the next replaces the projection of one corpuscle or layer (the place where the absence of x is viewed) by the projection of another corpuscle or layer; in that case, the processor does not “hold”, during the accent operation, the projection of the “place” where the absence of x is viewed. In Keijzer 1985 this case is called “coinciding projections”, i.e., the mental step is accompanied by a time step in the world stack. The accent operation is not merely mental in this case because the mental step from “not x” to “x” delegates to the past not only the projection “not x” but also the projection of the thing/layer to which it pertains.

Both the noncoinciding and the coinciding case come under the heading of nonconcurrent negation (“rhematic” accent).

Changes cannot be observed while they take place, i.e., the processor cannot look “in between” two corpuscles/layers.15

The term “momentary thing” or “corpuscle” used here must not be confused with what we normally think of as an entity: the referent of a verb or an adjective, say, can also be such a “corpuscle”, viz. a point of potential momentary attention. What we normally think of as an entity involves the idea of extension in time which is unknown in the microscopic world of accent; in this sense, in John is a lawyer there is one entity, whereas in John has a lawyer there are two entities, i.e., two things which have a life of their own. As we saw above, this difference is invisible to accent, because it involves the notion of time which is still embedded in, here, “is” and “has”. Thus we are dealing with a sequence of extensionless, momentary referents.

A world state is a “layer” rather than a “corpuscle”; it is preceded by a layer of the same type (i.e., also a world state), whereas an “x” projecting a characterizing property, for example, is preceded by a projection of a corpuscle of the next larger type, viz. a “thing”. The issue of whether a referent is a “corpuscle” or a “layer” has nothing to do with the difference between microscopic “time” and “depth” (see 2.11 for this difference), but the two give rise to different developments in the next phase.

2.6 Sentential coherence

As we saw above (2.5), the “hold” operation involved in the noncoincidence case excludes the layer/corpuscle whose projection is “held” during the accent operation from the negatable referent of the accented
element. It follows that the processor's creative powers are enlarged by refraining from such "hold" operations and by embedding as much information as possible in a single "x": he then adds to the world a new point with every accent, and this point, when decomposed, contains a whole "story".

However, in addition to the accent operation, the processor also has to cope with the speech chain. If the processor's creative powers were to be maximized, every word spoken would have to be a separate prosodic sentence, and the accent on it would have to be interpreted according to the coinciding case. More often, of course, words spoken consecutively are combined into larger wholes: chunks of information and prosodic sentences consisting of chunks of information. Creating sentential coherence between different elements of the left-to-right order inevitably leads to loss of creative power: contraction operations reduce negatability. Thus, in practice, processing must strike a balance between keeping information negatable, and hence within the creative powers of the processor, and reducing negatability.

As far as accent interpretation is involved, sentential coherence is retained as long as the negation of $x$, "x" preceding "y" in the left-to-right order, does not precede the negation of $y$ in the realm of referents created by the processor (but see the end of Section Three). The "span" of such "accent sentences", i.e., the domain within which accent interpretation is affected by the absence/presence of other accents, is, of course, determined by the processor's short term memory limitations. The limitation amounts to a memory for two moments of (microscopic) world time.

This is not to say that larger-scale prosodic units are impossible: intonational meanings (types of accent and pitch movement in unaccented parts) can create coherence patterns between larger units which are comparable to the "micro" types of coherence relevant to the interpretation of accent alone. In effect, a "thematic" accent chunk (see 2.9 below) and a "rhematic" accent chunk can together be the "theme" of a larger complex, the latter signalled by intonation.

Individual processing decisions are the outcome of the interacting forces mentioned in the foregoing, viz. the requirement that every element of the left-to-right order must have a referent negatable in the way required by accent, the information that must remain embedded (and hence negatable), the coherence-creating effect of contraction which reduces negatability, the coherence-reducing effect of not "holding" projections which enlarges negatability, and the requirement that sentential coherence be retained.
These decisions may be thought of as a process of building up the vertically layered world of accent. For a time, information is collected mentally; this chunk is then added to the preceding one; a new chunk is then built up and added to the preceding one, and so on. The information collected mentally has not yet been added to the world; it does not yet have a referent, the referent being created by adding it to the stack. "Building up" a chunk amounts to mentally counteracting the time dimension of the speech chain (contraction). Adding a chunk to the preceding one amounts to giving up this mental effort: the mind (short term memory) is emptied so that it can take in a new chunk. However, if no further measures are taken, it also means relegating the referent of the negation of the preceding chunk to the past, and hence giving up sentential coherence. Therefore, it either puts an end to an "accent sentence", or the first accent is changed into a "thematic" one: a negation of a non-concurrent negation ("not x" and "x" in different moments of projection time) becomes a negation of a concurrent negation ("not x" and "x" in the same moment of projection time). The latter is a further reduction of negatability, and hence of the processor's creative powers - see 2.9 below.

A further reduction would bring us to the next phase of processing; there, the processor introduces into the realm of referents a horizontal time dimension, i.e., the dimension which he, starting from the speech chain with this dimension, successfully eliminates in the present phase.

If we disregard the decision to insert a sentence boundary, the variants introduced by the difference between coinciding and noncoinciding projections (see 2.5 above and 3.1 ff. below), and the subsidiary procedures which reduce memory load, such as "processing in two steps" (see 3.4 below), the following three basic processing decisions must be distinguished (2.7-2.9).

2.7 Forward link

"Building up" a chunk means "looking ahead": not adding an x to the realm of referents until "x" has been combined with a projection "y" evoked by a word spoken later. This "look-ahead" strategy is called forward link and is symbolized as follows (for two accented elements, see below for the corresponding no-accent cases):

```
  "not x"  "y"  "not y"
```

```
  "x"
```
Here, "x" and "y" belong to a single chunk of information. They cohere because the left-to-right order is reversed in the bottom-to-top order: "x" precedes "y" from left to right but follows it vertically. The referent of "y" is the "place" where the absence of "x" is viewed ("not x" = "y"); "x" then presupposes "y", i.e., the accent on x does its job given y, so that it cannot affect y.

In other words, the processor, at the left-right position defined by "x", pretends that he is already at the position defined by "y": he uses y as the "place" where the absence of x is viewed. The arrow represents this mental movement of "x" to "y" as a result of which "x" is later in projection time than "y" although "x" precedes "y" in the left-to-right order.

Note that the forward arrow is not a projection of a movement: "x" does not yet have a referent, let alone one of the type "macroscopic entity capable of moving" (and hence existing in time).

Note also that there is no separate mental operation of linking "not x" to "y" (no arrow between "not x" and "y"); if there were, the referent of "not x" would not be the absence of x but rather itself a referent the thought of whose absence (in "place" y) could be evoked by an accent; it would then have to be expressed by a separate word.19

The effect of transforming left-to-right ordering into vertical hierarchy is retained in unaccented cases, which can be derived from the diagram given above by leaving out the "not x" or "not y". For example, in

```
    "x"  "y"
  "not y"
```

"x" and "y" are in the same moment of projection time (simultaneous projections); "x" and "y" are added to the realm of referents simultaneously (by the accent on y). Here, x is in the scope of the accent on y: in the moment of projection time when "y" is there, "x" is also there, and in the moment of projection time when "not y" is there, "x" is absent: x is parasitic on y. The referents are then in the same microscopic "span of attention", but only y is focused upon (i.e. introduced separately).

By contrast, in

```
    "x"  "y"

"not x"
```

y is not within the scope of the accent on x: "y" is already there in the moment of projection time when "not x" is there, i.e., its referent is not introduced together with x; being unaccented, y is not introduced sepa-
rately either. As a result, it is construed as no longer negatable (pre-existing, "given"). Thus the contraction operation introduces hierarchical prosodic organization (called "accent domain"), so that an accent on the last element includes (or rather: can include\textsuperscript{20}) the preceding word in its scope while the converse does not hold true.

If "x" is a noncoinciding case, the negatable referent of x is the identifying property of a layer/corpuscle introduced by "y". In the coinciding case, the negatable referent of "x" is itself a corpuscle (a separate point of potential attention), viz. one on top of the referent of "y"; the effect of the contraction operation on the realm of referents is depth between x and y in the case of coincidence. Needless to say, the processor cannot see what causes this depth (viz. his own mental operation), and the depth will disappear in the next phase of processing; here, it is opposed to the absence of depth, viz. to the noncoinciding case. See Section Three below for examples.

2.8 Parallel link

At first sight, it might seem that the simplest possible relationship between, on the one hand, left-to-right ordering and, on the other hand, a vertical sequence of momentary referents as introduced by accent would be established if the referents of projections evoked by subsequently spoken words were placed beside one another, i.e., if the left-to-right order had the iconic correlate of horizontally conceived space. In reality, however, the processor starts from the horizontal dimension of the speech chain as time. In such circumstances, construing two referents x and y beside each other (in the same vertical layer) is a complex mental operation consisting in "holding" the projection of the vertical layer to which "not x" pertains until the word y is spoken, so that "not y" can still pertain to the same vertical layer. In this form, the operation is possible, but it is only one of the processing possibilities and certainly not the most obvious one; it is the decision to regard speech time as a mental nuisance; its elimination must not result in depth in the realm of referents. This so-called parallel link is therefore characteristically used where the "normal" effect of contraction creates problems, as is the case in many negative sentences (see Section Three for examples).

However, parallel linkage is itself a type of contraction; while speech time is a nuisance, eliminating it mentally has a negatability-reducing effect. In the parallel link case, the effect is that the layer whose projection is "held" is excluded from the negatable referent of both "x" and "y": it pre-exists (is no longer negatable). It has no separate correlate
in the speech chain (otherwise, it could not be "held"), but is an unidentified world state which serves as the "place" where the absence of x and y are viewed. The elements "x" and "y" themselves either "fill in" the identifying property of this layer or add corpuscles while retaining the projection of the layer under it; these are the two variants of non-coincidence referred to in 2.5. A parallel link is symbolized as follows:

```
\text{"p"} \quad \text{"not x"} \quad \text{"not y"}
```

Here, the vertical layer p whose projection is "held" is the one no longer negatable (cannot be affected by the accents on x and y). Parallel linkage is defined on two accents; the corresponding one-accent case is simple noncoincidence. Projections "x" and "y" combined by a parallel link constitute neither one chunk of information nor two; this is an "in-between" type. There is an intonational "close knit" between "x" and "y" (no intonational boundaries). For further details see Keijsper (1985: 296-312; 1986: 293-296, 333-336). For some basic examples see Section Three below.

2.9 Backward link

The simplest processing decision in speech circumstances is translating the left-to-right order into a bottom-to-top ordering of referents in the same sequence. This possibility is called backward link and is symbolized as follows (with two accents - for the unaccented cases see below):

```
\text{"x"} \quad \text{"not y"} \quad \text{"not x"}
```

In this case there are two chunks of information (if the last element is accented); x is the "place" where the absence of y is viewed ("x" = "not y") and y is added to x. Projection "y" then presupposes "x", i.e., the accent on y does its job given x, so that it cannot affect x. This is the simplest possible operation (simple in terms of memory load); if it were the only one, the referent of every subsequently spoken word would simply be added to that of the preceding word, without any "holding" or "preplanning" of what is still to come. However, it is not always used, because it reduces coherence to the extent that without further measures, the referent of "not x" belongs to the past after the next accent operation.
If a backward link is chosen and an accent follows to the right and is interpreted as a coinciding case, retention of sentential coherence leads to a further measure, whereby the accent on the first element becomes "thematic":

```
  "x"  "not y"  becomes  "not x"  "x"  "not y"
```

This shift from a negation of a nonconcurrent negation to a negation of a concurrent negation is a contraction operation (the last one in the present phase of processing): now "not x" and "x" are contracted into the same moment of projection time, and their referents are in the same vertical layer in the realm of referents. "Not x" can then no longer project the absence of x (as x is there, in the same layer); instead, it projects things other than x. In effect, the processor here does not add x to the realm of referents but selects x from among other referents, all these referents being no longer negatable (pre-existing).

This is the limit of negatability reduction in the present phase of processing. The processor's "creative powers" are confined to replacing a projection of both x and other things by a projection of x alone; he narrows his span of attention to x, which is "creative" only in the sense that the processor is responsible for the operation. Beyond this point, the next phase of processing starts, where the processor eliminates his responsibility for developments in the world, being only an outside observer.

The corresponding unaccented cases can be derived from the backward scheme given above by omitting "not x" and/or "not y". In effect, in

```
  "x"  "y"
```

"y" is parasitic on "x" (y is included in the scope of the accent on x); in the moment of projection time when "x" is there, "y" is also there ("y" being added to "x" in the same moment of projection time). But in the moment of projection time when "not x" is there, "y" is absent: x and y are in the same microscopic "span of attention", but only x is introduced separately.

Just as in the forward-link scheme, the linkage operation results in depth in the realm of referents in the case of coincidence, but now the other way round: y is on top of x. If y is unaccented, "x" and "y" constitute a single chunk of information, now not by virtue of the link type
(as in the forward scheme) but by virtue of the fact that \( y \) is unaccented. The accent on \( x \) is then not reinterpreted into a "thematic" one (negation of concurrent negation): sentential coherence is ensured without this further contraction operation. Of course, the general contraction effect remains present; in \( NOUN \text{ Verb} \), for example, the negatable referent of "noun" is reduced in comparison with \( \text{Verb NOUN} \) (see Section Three for examples). In

\[
\begin{array}{c}
\text{"y"} \\
\text{"x"} \\
\text{"not y"}
\end{array}
\]

(no accent on \( x \), accent on \( y \)), \( x \) is not included in the scope of the accent on \( y \) (irrespective of whether projections coincide); in this case, the interpretation is that \( x \) is no longer negatable and that attention has already been narrowed to \( x \) alone, i.e., \( x \) has already been selected from among other referents.

2.10 Further research

A number of intricate cases, all brought under the heading of backward link in Keijsper 1985, remain to be investigated. As it is here that the next phase of processing starts, it is often difficult to separate "pure psychological" content from other types of interfering content. Some examples will be given at the end of Section Three and in Section Four.

Furthermore, larger prosodic units and prosodic means other than accent become relevant at this point. Bolinger (1989: 81-97, 171-209) gives a good illustration of the interaction of various prosodic means involved in sentence processing. He correctly takes into account the relative height of accents and types of accent as well. I think that is the direction in which the mechanism described here must be further developed.

But I believe it is also necessary to arrive at some understanding of the principle uniting the whole processing mechanism, including the second phase presented here. This is the line I have adopted since Keijsper 1985, which means that the analysis of the speech-chain-processing phase is still incomplete.

2.11 Conclusion

As will be clear from the foregoing, it is the mental contracting operations upon the speech chain which, in my view, are responsible for the fact that accents have scope (that so-called "accent domains" exist). The
traditional Prague School treatment of “psychological” content (see Section One) does not separate the effect of speech-chain contraction from accent (in a somewhat different way the same holds true for Generative Grammar treatments of accent). The name “Rheme” includes: 1. accented elements where the accents are interpreted as negations of nonconcurrent negations (both coinciding and noncoinciding cases of all types), and 2. unaccented elements included in the scope of accented elements interpreted in that way. The name “Theme” includes: 1. accented elements where the accents are interpreted as negations of concurrent negations, and 2. unaccented elements not included in the scope of an accent elsewhere (irrespective of whether this “given” interpretation results from noncoincidence or from link type). Only when the various factors contributing to interpretation are separated from one another does it become clear that all accents can be brought under a single heading, viz. “not not”, and that absence of accent has no meaning (although it does have an interpretation). In this way, the processing mechanism summarized here shows the feasibility of a Form-Meaning approach to “psychological” content.

The output of processing is a microscopic world created by the processor without a horizontal time dimension. This is, in my view, the unavoidable consequence of not disregarding the mental operations needed to eliminate speech time. In that case, speech-chain contraction alone (without accent) gives rise to vertical layering in the realm of referents, viz. microscopic depth. Accent adds microscopic time, which is also conceived vertically. The only difference between the two is simultaneous vs. nonsimultaneous projection of momentary layers/corpuscles. Thus, if \( x \) and \( y \) are different corpuscles/layers ordered vertically as a consequence of speech-chain contraction, the corpuscle/layer \( y \) does not contain \( x \), but the two corpuscles/layers are projected simultaneously as long as no accent is involved; this is possible because one is not the negation of the other. If, by contrast, a layer \( y \) contains the absence of \( x \) (the referent of “not \( x \)”), this layer and \( x \) cannot be projected simultaneously, because it is impossible to think simultaneously of \( x \) and the absence of \( x \) in the same place (“vertically”). In other words, the concept “a projection of the absence of \( x \)” ensures that even in the microscopic world of accent there is a difference between time and depth (both conceived vertically): in the case of coincidence, the former is correlated to the mental introduction of time, viz. accent, while the latter is correlated to the mental elimination of time, viz. speech-chain contraction.
Needless to say, the output is so different from our perception of the world around us that, at first sight, the account of accent which gives rise to this strange result seems to be simply wrong. Of course, I considered that possibility when I realized what it was that I had proposed in Keijsper (1985) on an intuitive basis; but I now think that in principle the proposal was correct, although it must be seen as the first part of a longer story. The microscopic world of accent disappears as soon as the processor no longer acts upon the speech chain, but forms projections of the elements he has temporarily stored in the microscopic world. When he does so, he shifts to another, “macroscopic”, notion of time and negation, which turns things into what we think of as normal. It does so because it is based on the more common idea that the world exists independently of the processor: it is a further cycle in the process of negatability reduction which starts with speech-chain contraction.

Section Four below explains what accent cases induced me to develop the processing mechanism in that direction (see also the end of Section Three). Part Two is the first tentative result; to my mind, it confirms in retrospect my 1985 treatment of accent (with the addition of the corrections given here and in subsequent notes). Before we turn to that, Section Three elaborates on Section Two and gives a number of examples; readers interested mainly in the continuation of the story can skip that section, only consulting it at points where comparisons between the two phases of processing are made in the sequel (as indicated in the text).

3. Examples and discussion

3.1 Minimal accent operation

As we saw in 2.5, the mental operation replacing “not x” by “x” in the next moment of projection time need not be accompanied by a change of corpuscles/layers in the world stack, the minimal negatable referent being the identifying property of a given momentary thing. Accents on first and second person pronouns are often interpreted in this way, because the persons called “I” and “you” are normally construed as “given” (no longer negatable), and thus are not included in the negatable referent of “I” and “you”. They are the speaker and hearer of the given speech act as seen by the speaker. In general, of course, the words I and you are then not accented, so that no referent for “not x” need be created. Thus, while we normally say (I cannot come with you because) my HUSBAND has a headache, in the corresponding I’ve a HEADache, an accent
on *I* is absent (not: *I'VE a headache*). Here the person called "my husband" is included in the negatable referent of "my husband": the person is added as a new point of attention to the current world stack. The person called "*I*", in contrast, is treated as no longer negatable.

If somebody nevertheless says *I'VE a headache*, the most obvious interpretation is one with noncoinciding projections: "somebody (unidentified but given point of attention) has a headache; that somebody is me": "*I* fills in the identity of a person already present in the current world stack, so that the negatable referent of "*I*" is only that person's identifying property, not the person him/herself. The accent, which adds no new point of attention, does not include the rest of the sentence in its scope: everything excepting the person's identity is interpreted as "given" information. (In contrast to the accent in *My HUSBAND has a headache*: this sentence can be entirely "new" information because the accent can introduce the person as a new "corpuscle".)

Construing persons called "*I*" or "*you*" as negatable is not impossible but it requires a context different from prototypical speech situations. For example (see Keijser 1987b: 171) *She is rescued by a boat. They are on a lonely beach far from anywhere. And then *I* appear — the last thing she expects. A doctor! (A. Christy).* Here, the speaker recounts a scene where he figures as a new point of attention for somebody else (for the person called "she"). In that case, viz. an "*I*"/"*you*" not referring to the participants of the given speech act but to the same persons seen in another situation, first and second person pronouns follow the regularities of most nouns (and third person pronouns); an accent on them then can include unaccented elements in its scope: the persons referred to are then included in the negatable referent of "*I*" and "*you*" (coinciding projections).

This may suffice to illustrate the negatability concept, and the necessity of thinking "microscopically" when discussing accent. Thus, while accent is sensitive to the subtle difference between the referents of "*I*"/"*you*" seen in one way or another, it is, as we saw in 2.4 above, insensitive to seemingly far more important differences, such as that between *John is a LAWyer* and *John has a LAWyer*: accent cannot "see" the difference between a lawyer identical to John and a lawyer which is not John, because the latter information is still embedded in "is" and "has".

Noncoincidence of the type just illustrated is often called "contrastive accent" (cf. the person having an headache is *me*, not somebody *else*); for the reasons explained in Keijser (1985: 19-34, 117-118, 196-198, 287-289) this name is too confusing to be of much use, the "contrastive"
interpretation being an inference often accompanying the noncoinciding accent interpretation.

In negative sentences, noncoinciding accent interpretation in combination with this inference (not \( x \) but \( y \)) is often mistakenly ascribed to the negation element occurring in the sentence, instead of to accent (which is, of course, also negation, but not as a separate element of the speech chain). Boguslavskij (1982) lists 17 differences between “noncontrastive” and “contrastive” use of Russian \( ne \). He remarks correctly (1982: 74) that the differences do not imply the existence of two lexemes \( ne \). Nor, in my view, do they imply that \( ne \), itself, has a different scope in the two cases: it is the accent which has a different scope, and the same possibility exists for last accents in positive sentences (see Keijsper 1986: 300, 304-305 and notes 19 and 32 here). The term “metalinguistic negation” sometimes used for the noncoincidence (plus inference) interpretation in negative sentences (e.g., Horn 1989: 363-444), reflects the fact that in that case the accent operation is merely a mental operation (see 2.5 above). Again, in positive sentences the same accent interpretation is available, i.e., we must not ascribe the possibility to the negation element occurring in the sentence, as “logical” treatments of negation do. But if such treatments regard “not not \( x \)” as equivalent to “\( x \)” and/or regard accent as belonging to (logical) pragmatics, they cannot, of course, account for the effect of accent.

3.2 Forward link: coincidence

A simple example illustrating the “look-ahead” mechanism called forward link is the Russian attributive adjective plus noun combinations. Consider the phrase \( Vysokij dom \) (high house). As we saw in 2.7, the arrow symbolizes that the processor, at the left-to-right position defined by the adjective, pretends that he is already at the position defined by the noun, thus mapping the referent of the adjective onto the referent of the noun. As a consequence, an accent on the noun can include the adjective in its scope (\( Vysokij DOM \)), whereas an accent on the adjective does not include the noun in its scope (\( VySOkiij dom \)).

As we saw in 2.4, the negatable referent of the adjective in the combination includes only the property /high/, not a thing carrying the property. This is, for the given construction, the negatability-reducing effect of speech-chain contraction: if the adjective follows the noun, the noun being linked forward to the adjective (see below), the negatable referent of the adjective does include a thing. Thus, in \( Vysokij DOM \) the negatable
The referent of the first element is reduced in comparison with the referent of the same element in final position, but the referent concerned ("thing") remains negatable in the second element (in contrast to other link types - see below). Both the referent of the adjective and that of the noun are construed as momentary "corpuscles" (one on top of the other - called "figure/ground organization" in Keijsper 1985): the arrow symbolizing the mental contraction operation has depth as its world effect; the property and the thing are then both potential points of momentary attention, having their own momentary identity (in contrast to the first element in the subtype dealt with in 3.3 below). Needless to say, the names "property" and "thing" have mnemonic value only, standing for the different hierarchical "rank" of corpuscles.

The subtype dealt with here is the maximum reversal of the left-to-right order into the bottom-to-top order (maximum contraction). It is characteristic of nonpredicative synsemantic meanings in first position. The type also occurs with predicative second elements, e.g., On krepko SPIT (He soundly SLEEPS), but not with predicative first elements (see 3.5 below).

3.3 Forward link: noncoincidence

If we now change the order of adjective and noun, retaining a forward link, viz. dom vysokij (lit. house high) (see below for lexical restrictions), we clearly see the effect of contraction. First, as regards the adjective, its negatable referent now includes a thing, i.e., an accent on the adjective now adds to the realm of referents something with the property /high/. By contrast, the negatable referent of the noun, which is now in nonfinal position, does not include a thing but only the identifying property /dom/ of such a thing, viz. of the thing which is introduced by the adjective: "dom" fills in the general idea "something" introduced by the adjective, i.e., it pertains to the same corpuscle (referred to in Keijsper 1985 as a "part/whole organization"). As a consequence, an accent on the adjective can include the noun in its scope but an accent on the noun cannot include the adjective in its scope (in contrast to type 3.7 below!).

The subtype reverses the left-to-right order vertically, but less drastically than subtype 3.2, as the noun does not add a separate "corpuscle" on top of the "something" introduced by the adjective.

The reduction of the negatable referent of the noun, in comparison with the referent of the noun in end position (3.2), is reflected in the observation that the nouns in construction 3.3 are "pronominalized" (Sirotinina et al. 1968: 91). This effect can be observed in English in, e.g.,
A real nothing vs. Nothing real: the latter arrangement is "normal" for words like nothing and something, because in that case they remain "partitives" ("nothing" in nothing real referring to an empty part of a whole of real things, "something" to a non-empty part). In final position, viz. a real nothing/something, the words become nouns: their negatable referent now includes a thing ("corpuscle").

In Russian, subtype 3.3 is unstable if the first element is an accented noun and the second element is unaccented: in colloquial Russian, noun plus attributive adjunct combinations with an accent only on the first element are generally processed in accordance with type 3.7 below, e.g., DOM vysokij. The instability is a consequence of the autosemantic nature of nouns: when the processor is at the left-to-right position defined by the noun, he is not obliged to "look forward" to the adjective (or other attributive adjunct), because the noun does not inherently suggest the latter. Nevertheless, nouns can be combined with subsequent attributive adjuncts into a single chunk of information in the way of subtype 3.3. In other words, the distinction between looking forward and not looking forward during sentence processing does not coincide with that between synsemantic and autosemantic meanings. Nor does it coincide with the distinction between "modifiers" and "heads" (or comparable terminology): all treatments of accent in such terms fail to cover the facts of Russian (cf. Keijsper 1985: 58-60; 1986: 359-360). The usual terminology (synsemantic/autosemantic, head/modifier) only explains the relative instability of subtype 3.3 in comparison with 3.2, where the adjective inherently requires a "something", so that looking ahead for that thing is the obvious thing to do.22

In Russian, subtype 3.2 is regarded as stylistically neutral for agreeing adjuncts in first position, whereas subtype 3.3 is more common with non-agreeing adjuncts in second position (also indeclinable adjectives). In most cases, subtype 3.2 with nonagreeing adjuncts (Petra tvoren'e (lit. of-Peter creation), Gvardii major (lit. of-guard major)) is "high style" or archaic (Grammatika 1980: 198 mentions the main exceptions - see Keijsper 1985: 222-223 for the probable explanation). The occurrence of subtype 3.3 with agreeing adjuncts in second position is restricted in Russian. First, there can only be one such adjunct, further adjuncts being linked backwards (a fact reflected in the traditional name "obosoblenie"): Ivan - čelovek DOBRyj, nePJUščij (lit. Ivan (is a) man GOOD, nonDRINKing). And second, the subtype is common only with "desemanticized" nouns in first position (čelovek (man), ženščina (woman), etc.), which reflects
the “pronominalizing” effect of the type mentioned above. See Sirotinina et al. (1968: 89-92); Keijsper (1985: 223-224).

3.4 Forward link: reducing memory load

Since forward links - more than other types - reverse the left-to-right order into the bottom-to-top order of referents, the maximal degree of speech-chain contraction would be a sentence processed with forward links only. However, since forward linking is “looking ahead”, it enlarges the “processing depth” of constructions, which encounters (“short term”) memory restrictions. Therefore, in series of forward links of subtype 3.3, processing often proceeds in two steps: first some “x” closes a chunk of information, but the same element is then taken up as the first element of the next chunk, where the range of its potential referents is further restricted (see Keijsper 1985: 256-258). For example, in ponizhenie urovnja vody pritoka VOLgi (lit. lowering of-level of-water of-tributary of-Volga), there is a great deal of information to plan; it tends to be chunked in steps, viz. as (ponizhenie1 x ponizhenie2 urovnja vody1) (vody2 pritoka volgi). Prosody reflects the stepped procedure: most often, the element which first closes a chunk and is then taken up in the next one is accented, alongside the last element of the latter (the first accent ending the preceding chunk); there can be a prosodic boundary between the two: ponizhenie urovnja vody pritoka VOLgi (cf. Van Helden 1993: 608-609).

The same is possible, but less “normal”, in subtype 3.2 (except when a parenthesis follows); with synsemantic meanings the first element then introduces an open “slot” which is resumed in the next chunk. This procedure is described by Schilperoord (to appear) as a regular “dictation strategy”, as in the Dutch example: In de procedure VOOR/ HET/ beantwoorden VAN/ de post VAN/ cliënten IS/ (With respect to the procedure for answering clients mail is ...). Accents then occur on words which would normally remain unaccented because of their nonfinal status within chunks; in the “dictation strategy” we treat them as chunk-final, so that the rest of the chunk need not be planned beforehand.

For still other measures reducing “processing depth” see Keijsper (1985: 254-256). The strategies concerned require further investigation.

3.5 Forward link: restrictions

Subtype 3.2 does not occur with predicative elements as the first element, while subtype 3.3 does, in Russian, for example: Nastala vesNA (lit. Came SPRING), (Ivan) citaet KNigu (lit. (Ivan) reads BOOK), (Ivan)
pošel do MOJ (Ivan went HOME), etc. Just as in the attributive application, the last element here introduces a category “filled in” by the first element, in this case by the verb; in Ivan živet v AmsterdaMe (Ivan lives in AMsterdam), for example, “v Amsterdam” has the negatable referent being in Amsterdam, and “živet” fills in the way of being. The fact that being (somewhere) is not included in the negatable referent of “živet” but in that of “v Amsterdam” can be observed in Ivan živET v Amster­dame: “not živet” evoked by the accent on the verb also presupposes Ivan’s being somewhere; in effect, the accent then introduces only the particular way of being we call “living” (the identifying property of the general cate­gory) but not being somewhere per se. Since “živet” in this sentence loses negatable information in comparison with the same word used in isolation, it is interpreted differently than in Ivan živET; in the latter case, an accent on the verb introduces “living” not as a way of being somewhere, but as being alive. In the same way, a sentence like Koroleva naxoditsja v ANglii (lit. Queen finds-herself [is] in ENGLand), with a relatively “empty” verb filling in the idea of being in England, is normal, whereas Koroleva naXOdit­sja is odd without a motivating context: it says that the Queen might fail to be located (somewhere). The following example provides such a motivating context (prosto): Konečno, bylo by xorošo. Kak v Anglii! Tam upravljajet prem’er-ministr, a koroleva prosto naXOdit­sja (Ogonek 48, 1990) (Of course, that would be good. As in England! There the prime minister rules, and the Queen simply IS there). With a verb in first position (Verb - Noun) the last element introduces the general category called “world state”; the preceding verb identifies this world state but does not include it in its negatable referent.

The different status of the first element in subtypes 3.2 and 3.3 (as a separate momentary thing as opposed to “filling in” a different thing) can easily be illustrated with verbs as first elements, because verbs exclude subtype 3.2; as soon as the verb can no longer be interpreted as “filling in” an unidentified referent introduced by subsequent elements, a forward link is excluded (and type 3.7/3.8 below appears). Thus, in Vysokij dom (subtype 3.2) we can say that reference is made to a house, which is, in addition, high; in the microscopic world of accent this means that the property is a different momentary thing than the house. But in Ivan živet v Amsterdame, we cannot paraphrase the meaning as “Ivan is located in Amsterdam and, in addition, lives”; rather, living is only the more specific name of being located in Amsterdam. As regards accent, this means that “lives” does not add a separate corpuscle (potential point of attention), but rather applies to the same one as the general “is located”, the latter
being included in the negatable referent of “v Amsterdame” but not in that of the verb.

In the same way, forward linking in (Dutch) \textit{Piet lag in BED} (Peter was lying in BED) is possible, “lying” being construable as a way of being in bed, the latter introduced by “in bed”. But \textit{(Piet) las in BED} requires the paraphrase “Piet was in bed and, in addition, was reading”. This would be subtype 3.2 if that type were possible with verbs as the first element; as it is excluded for verbs, the sentence is processed according to type 3.8 below (\textit{las in bed}). In effect, the verb is not included in the scope of an accent on the prepositional phrase, while the latter can be included in an accent on the verb (cf. \textit{Why did you divorce your husband? He READ in bed}).

These facts are, of course, well known in other terms which give different names to the prepositional phrases. I would suggest that these other terms are names for types of negatability variation; they become redundant if the latter, more general, principle is recognized. Thus I do not regard the traditional terminology as an \textit{explanation} of my types of speech-chain contraction, but rather as overly restricted names for the same thing.

The fact that subtype 3.2 is excluded with verbs (predicative elements) as first elements is evidently a consequence of the fact that verbs embed a projection of time: there is a certain “trade-off” between the degree to which the speech chain can be contracted (i.e., the degree to which the time dimension of the speech chain can be counteracted mentally), and “embedded” time, which must remain negatable during these operations.\textsuperscript{24} If subtype 3.3 is possible with verbs in first position, the time dimension of the speech chain can be counteracted by means of a forward link, but not completely: the first element cannot define a separate momentary thing on top of the thing introduced by the second element (as in 3.2), but can only be the identifying property of the thing introduced by the second element, as in type 3.3, i.e., the time idea (“being in Amsterdam”) is negatable in the second element, more to the end of the sentence, as the general contraction effect (see 2.4) would predict. It would be interesting to investigate this point in a large number of languages.

Not only is subtype 3.2 excluded with verbs as the first element, many languages also show restrictions on subtype 3.3 with verbs in first position, i.e., they resist forward linking of verbs altogether. Besides the conceptual problem of eliminating speech time while retaining embedded time, the nature of the general category introduced by the second element in subtype 3.3 probably plays a role in such restrictions as well. Thus in \textit{Nastala...}
vesNA, the negatable referent of "vesna" is not only a "corpuscle", but also the layer under this corpuscle, viz. the world at a given moment ("world state"); this is the reflection in the present phase of the fact that vesna is not simply a noun, but a noun functioning as, here, a subject (the same holds true for objects).

A world state is to a noun (nominal phrase) what a noun is to an adjective, i.e., of the next "larger" rank. But a world state has a special status (see 2.5 above): if we remove it vertically, we do not arrive at another thing of the next larger hierarchical rank, but, again, at a world state, a sequence of world states being the closest approximation of what we normally regard as time which is possible in the logic of accent. Thus the negatable referent of "vesna" in the example includes a thing plus a world state (in contrast to a noun functioning as subject/object in nonfinal position, where the world state does not belong to the negatable referent - see 3.7 below). But then, an accent on vesna introduces the world at a given moment rather than a momentary thing, and the verb fills in the identifying property of that world state. Many languages reject this idea, because the step from one world state to another made by accent here equals a moment of time in the next phase of processing (see Part Two). In other words, in Nastala vesNA the accent does what decomposed verb meaning does in the next phase of processing, so that, in a sense, we are already in the "wrong" phase of processing. This problem does not arise if the verb follows the subject (see 3.7 below): in that case (the verb now being final in the combination and hence having a larger negatable referent), the verb's referent is a separate corpuscle, here, a time-embedding property, instead of only the identifying property of the world state introduced by an accent on the noun; the separate momentary thing in Noun VERB embeds the idea of a transition between world states (which comes to light in the next phase). The same holds true for Verb OBJECT as compared to OBJECT Verb in, say, Russian (not in verb-second languages, where verb position has acquired another meaning).

The noun (or noun phrase) in Verb NOUN is called "internal", and that in Noun VERB "external", in one of the senses in which these terms are currently used in Generative Grammar. I will return to this point in Section 8 below. Here, it suffices to say that in the present phase of processing, noun phrases are not yet Subjects or Objects: the latter division is one of the next phase of processing. This point explains many problems in current versions of Generative Grammar, which are based
on the idea that in the present phase "internal" equals Object and "ex-
ternal" Subject.

Languages differ in the extent to which they allow subtype 3.3 with
verbs as the first element; it is not logically impossible to have an accent
on the last element replace one world state by another, with the preceding
verb giving the identifying property of the world state introduced by
accent, the world state, itself, consisting of a transition between world
states. However, it is difficult to imagine that the accent does not come
instead of the embedded "verbal" time if it does not introduce a thing
alone. If forward linking of verbs is excluded altogether, the logical con-
sequence is a consistent end position of verbs, or sentences in which
elements following the verb are added to it as an "afterthought" (types:
He-HIT-her, John Mary; John HIT-her, Mary; Mary he-HIT, John).

The restrictions on forward linking of verbs can also be partial. In
Russian, for example, subtype 3.3 is possible with verbs and other inher-
ently predicative elements, but if, for example, a long form of an adject-
ive, which is not inherently predicative, is linked forward to an accented
noun, a predicative reading is virtually impossible (instead, the exclusively
attributive subtype 3.2 appears). In Dutch, forward linking is excluded
for nonfinite verbal elements: in contrast to English, the string Piet heeft
gelezen een boek (Peter has read a book) cannot be processed:

*Piet heeft gelezen een boek

If "gelezen" is to be linked to "een boek", it must follow the latter in
the left-to-right order: Piet heeft een boek gelezen. The sequence Piet
heeft gelezen een boek can only be:

Piet heeft gelezen een boek

This is most natural in enumerations: Piet heeft gelezen: een boek, de
krant, 5 studieboeken, etc. It is obligatory with an object sentence and
possible with prepositional phrases following the verb. The difference
between Dutch and English here has interesting consequences for the
differentiation between prepositions and phrasal verbs, which must yet
be investigated in detail (see Keijsper 1985: 345-356).

The precise restrictions on verb processing must be specified for each
language separately; my approach has so far been confined to explaining
the cause of restrictions on verb placement, which are the best-known
illustration of interaction between speech-chain processing and embedded
content.25
3.6 Parallel link

Parallel links can be subdivided in the same way as forward links (3.2 vs. 3.3), but here only the difference with other contraction types will be exemplified (for the subdivision see Keijsper 1986: 333-336). The difference between parallel and forward links can best be illustrated by means of examples such as the Russian *Ja vas DOLgo ne zaderŽU* (lit. I you LONG not shall-deTAIN) vs. *Ja vas DOLgo ne uVIZu* (lit. I you LONG not shall-see). First, it must be remarked that the negation of “ne verb” evoked by accent is “verb” (see Keijsper 1986 for details; cf. Section Four below). In a parallel type of speech-chain contraction, a combination of two projections pertain to the same (no longer negatable) world state as the combination of the negations of the two projections; in the example: “dolgo” “ne zaderžu” and “not dolgo” “zaderžu”. In effect, the sentence then neither asserts that detaining takes place nor that it does not take place: both are true simultaneously, but one only in combination with “not dolgo” and the other only in combination with “dolgo”: IF I am detaining you (but maybe I am not) the detaining will not last long. In contrast, the forward link example, *Ja vas DOLgo ne uVIZu*, takes “ne uvižu” as the “anchoring place” of “not dolgo”: the accent on dolgo does its job given “ne uvižu” (see the scheme in 2.7). In effect, the sentence says that I will not see you and that, in addition, the not-seeing will last long, i.e., the truth of ne uvižu cannot be affected by the adverb.

In Russian, the parallel type in such examples permits perfective aspect in combination with durative adverbs such as dolgo, both in the present tense and in the preterite (e.g., *On DOLgo ne proderŽALsja;* lit. He LONG not hold-OUT). The forward type does not allow perfective aspect in the preterite (*Ja vas DOLgo ne uVIDel). This is another example of interaction between speech-chain contraction and embedded types of content, here verbal aspect. In English the semantic difference is rendered by different word orders or adverbs, because a negation accompanying the verb is, in contrast to Russian, not a sufficient condition for parallel link (see Keijsper 1986: 293-296 and Section Four below).

The well-known *He doesn’t beat his wife because he loves her* illustrates the difference between parallel and backward link. A parallel link ensures that the negation of “he doesn’t beat his wife”, i.e., roughly, “he beats his wife”, does not belong to the past when the second part of the sentence is processed; in effect, the negation of the second part, roughly “not because he loves her” can then still be combined with the negation...
of the first part, so that two combinations are made: “he beats his wife” (negation of the first part) - “not because he loves her” (negation of the second part), and “he doesn't beat his wife” - “because he loves her”; both are true about a single world state. If, in contrast, the projection of the world state to which the negation of the first part pertains is not “held”, the first part introduces a world state and a backward link appears between the two parts: the second part of the sentence then gives the reason for his not beating his wife, a reason which could be absent (or replaced by another reason) without affecting the truth of the first part: the sentence asserts that he doesn't beat his wife, the reason being added afterwards as additional information. A prosodic boundary between the two sentence parts leads to a backward-link reading, as it says (roughly): “the information up to this part can be processed separately”, i.e. no “hold” operation is required.

In corresponding Russian examples, parallel links again exhibit aspectual peculiarities: in, for example, Ja ne DUmaju, ěto vam stoi izmenjat' na-ZVAnie stat' (I DON'T think that it is worth changing the NAME of the article) the dependent clause contains an imperfective aspect, although the negation licencing this aspect (in a non-iterative case) appears in the main clause (see Kobozeva 1976).

Corresponding phenomena in English (such as the use of any where otherwise some would be required, and “tags” to the dependent clause normally used with negative sentences) were, in one period of Generative Grammar, “explained” by means of a transformation moving the negation from the dependent to the main clause (see, for example, Lakoff 1969; Seuren 1974). The “deep structure” which presumably explains the peculiarities is the interpretation resulting from parallel sentence processing. The generative discussions of the phenomena concerned illustrate my point (see Section One) that sentence processing is not merely a matter of “performance”, which can be ignored in analyses of “competence”: a thorough analysis of processing regularities can replace a large part of Generative Grammar analyses of “competence”. What such analyses fail to give is the level of timeless meaning.

In English, parallel link is one of the interpretations of the meaning of Auxiliary - Subject order: With NO job would John be HAPpy (vs. backward link in With no JOB, WOULD John be HAPpy! and in With no JOB, John would be HAPpy). The parallel connection between the two sentence parts ensures that two pairs (“with no job”“John is happy” and “with all jobs”“John is not happy”) are true about the same world state. In With no JOB, WOULD John be HAPpy! in contrast, the meaning
of Auxiliary - Subject order does not pertain to the connection between
the two sentence parts but only applies within the second part. On the
level of timeless meaning, of course, these applications of Auxiliary - Sub-
ject order - and others, such as “question interpretation” - can be brought
under a single heading: roughly, “x” and “not x” are alternative projec-
tions of a single (no longer negatable) world state”.

As we saw in 2.8, parallel links cancel, as it were, the “normal” effect
of speech-chain contraction, viz. vertical hierarchy. Therefore, they are
often used in negative sentences. For example, if in \textit{NOTHING is SACred}
no parallel link were chosen, “nothing” would refer to a \textit{thing} (as in \textit{A
real NOTHING} - 3.2) instead of to an empty part of the whole of things,
i.e. \textit{NOTHING is SACred} would assert of something (called nothing) that
it is sacred. Thus, in the case of fused negations, a parallel link serves
to retain a noncoinciding accent interpretation where two accents are
involved (see Keijser 1985: 302-312).

In Russian, a parallel link requires \textit{ne} preceding the verb, which gives
rise to a so-called “double negation construction”. For example, \textit{On nikog-
da ne vret} (lit. He never not lies, i.e., he never lies) denies that he lies.
Compare, without \textit{ne}: \textit{Oni verNUlis' ni s ČEM} (lit. They returned not
with something); here, it is not denied that they returned: they did return,
but with nothing (without anything).

The problem of negative sentences which gives rise to frequent parallel
links is essentially the fact that negative sentences are concerned with
mentally removing referents which are first thought to be at least poten-
tially present. During this mental act of removing, there must be no cor-
responding replacement of world states in the realm of referents, because
the thing involved must be removed from the same time as where it was
imagined to be present: the idea that \textit{x} is \textit{first} present and \textit{then} absent
does not deny that \textit{x} is present but says that it is both present and absent,
viz. at different moments. If two accented sentence elements are involved
in this basic idea of negation, the way to “hold” the projection of the
world state where both the presence and absence are viewed, is a parallel
link.

As the examples above show, a parallel link is accompanied by the
idea that two things are true simultaneously: if we choose “x” we must
choose “not y”, and if we choose “not x” we must choose “y”. In English
and Dutch this truth aspect of parallel links is always present. In Russian,
sentences with the “double negation” construction pattern, as far as truth
is concerned, with sentences conveying absolute absence or presence (see
1989: 160-163) for the related difference between English fused negations (*nobody, nothing* etc.) and *not ... any*.

There are language-specific conditions for the occurrence of parallel links. For example, in the case of a subject-adverb-negation-verb order as in *Ja vas dolgo ne zaderžu* (lit. I you long not shall-detain), parallel links are only exceptionally possible in Dutch (e.g., *ik begrijp niet waarom hij dat al niet heeft gedaan* (I don't understand why (lit.) he that already not has done); *zo en al allow this). Normally, Dutch allows parallel links only with the adverb in sentence-initial position, e.g., *LANG duurde het NIET* (Lit. LONG lasted it NOT), the Verb - Subject order following the adverb being the relevant formal parameter. But in English, we no longer find Auxiliary - Subject here, except with pronouns (although, e.g., *VERy old are they NOT* is "archaic"); interestingly, the alternative, viz. Subject - Verb order, has not yet become standard, the type *BEAUTiful my daughter ISN'T* being characteristic of "Yiddish English" (see, e.g., Haiman 1974: 65). In contemporary Russian the order of verb and subject is irrelevant to the issue of parallel links, *ne* before the verb being the relevant formal feature.

Such language-specific details must, of course, be added to the general overview presented here; what this amounts to is different meanings of specific word orders (different subclassifications of the general negatability-reducing effect of contraction) and a different status of the verb in determining a sentence's "polarity".

### 3.7 Backward link: unaccented second element

In "x" "y" with an unaccented second element, the two elements belong to a single chunk of information. A number of subcases can be distinguished. In (attributive) *DOM vysokij*, the backward link type simply reverses subtype 3.2. As in that subtype, the adjective "loses" information to the noun, its negatable referent including not a thing but merely a property. As long as the adjective does not become predicative (as it preferably does when accented), the general contraction effect, viz. negatability reduction from left to right, is absent, in the sense that the adjective does not convey more negatable information than it does in nonfinal position. This gives the adjective the status of an "afterthought", which is one of the implementations of the difference between a forward and a backward link, i.e. less coherence in the latter. Thus, at the left-right position defined by the noun, the processor does not look forward to the adjective; instead, the latter is added "on second thought". As a con-
sequence, an accent on the noun includes the adjective in its scope. The absence of a “look ahead” procedure in noun adjective ensures that fixed combinations such as żeleznaja doroga (lit. iron road, i.e., railway), belyj dom (white house) are no longer fixed combinations when reversed:

DOM belyj, for example, introduces a normal house which happens to be white, not “the” White House (in either Washington or Moscow).

The unstable (attributive) subtype 3.3, such as dom vysokij (lit. house high), dom z mezzoninom (lit. house with entresole), etc., easily shifts to noun adjunct if the first but not the second element is accented. The latter does not have the lexical restrictions of subtype 3.3. In colloquial Russian, backward linking is very frequent, both with agreeing and nonagreeing attributive adjuncts in second position; typically, the unaccented tail is prosodically united with the preceding accented element by means of the type of intonation which gradually falls to mid-level in postaccentual syllables (see Keijsper 1992: 202-203). In addition, in colloquial Russian backward linking of the “afterthought” type is responsible for a large part of the so-called nonprojective arrangements occurring in that style (see Keijsper 1985: 132-137).

In English, the difference between 3.3 and 3.7 has been illustrated by Enkvist (1980: 147) with the help of *I gave my HORSE a bit to CHEW* vs. *I gave my HORSE a BIT to chew*: if the accent has broad scope in both cases, unaccented *bit* in the former is most obviously intended as a partitive, according to the “pronominalization” (part/whole) effect mentioned above. It can, to be sure, be interpreted as “a piece of a horse’s bridle” but then *bits* must be construed as coming in types: bits to CHEW and other bits. In *I gave my horse a BIT to chew*, in contrast, the “horse bridle” interpretation is normal, because here the word has the same negatable referent as in 3.2, viz. a thing instead of only the identifying property (or part) of a thing. If here *bit* is given the partitive reading, the accent on *bit* does not include to chew in its scope, because it then does not add a new point of attention (noncoincidence).

The opposition between 3.3 and 3.7 is best known from the “long and fruitless debate” (Bolinger 1989: 235; 199-200; 232-238) about pairs such as Helen left directions for George to FOLLOW (“directions” filling in “something to follow” introduced by to follow; the accent then has broad scope) vs. Helen left directiONS for George to follow (“to follow” ex-
plaining, as an afterthought, what directions are - broad scope reading). Hopefully, Bolinger's 1989 discussion will close the issue.

Type 3.7 can reverse 3.3 with a verb in first position and a prepositional phrase in second position: Piet lag in BED vs. Piet heeft in BED gelegen. In both cases the verb then "fills in" the "being in bed" idea negatable in "in bed". If, in contrast, the verb conveys information in addition to that general category, both Piet las in bed and Piet heeft in bed gelezen have a backward link. The verb in Piet heeft in bed gelezen not filling in the "being in bed" idea, it is usually accented as well: Piet heeft in BED geLEzen; otherwise (Piet heeft in BED gelegen) the verb is interpreted as "given" information: it cannot be included in the scope of the accent on bed (in contrast to Piet heeft in BED gelegen).

This further subclassification of backward links (related to the possibility/impossibility of forward linking in Piet lag/las in bed) is only briefly discussed in Keijsper (1985: 325-326) in application to Russian Na stoLE obed (On the TABLE is lunch), where obed cannot be included in the scope of the accent on stole, although it is linked backwards. In this respect prepositional phrases in first position differ from noun phrases: the accent in obed na stole does include na stole in its scope. Apart from accent interpretation, the further subclassification needed is relevant for coreference possibilities (see note 71 below).

Type 3.7 is only a partial reversal of 3.3 with a verb in first and a noun phrase in second position, as in VesNA nastala instead of Nastala vesNA. As we saw in 3.3, in Verb NOUN the negatable referent of the verb is the identifying property of the world state introduced by an accent on the noun, i.e., a world state belongs to the negatable referent of the latter. In NOUN Verb, in contrast, the negatable referent of the noun or noun phrase is reduced in comparison with Verb NOUN (general contraction effect), but in contrast to what happens in forward link cases, the category concerned (world state) does not remain negatable in the second element. Instead, the noun or noun phrase loses negatability "to the context": sentences such as VesNA nastala are interpreted as applying to a "given" (no longer negatable) world state, normally "the world as it is at this moment"^{26}. The verb in NOUN Verb then adds a property which embeds at least one transition between two world states, i.e., it
introduces a momentary thing which can subsequently be "unrolled" in time.

The same happens when noninherently predicative elements become predicative: if \textit{DOM vysokij} means "the house is high", or if \textit{KNIga na stole} means "the book is on the table", the property added to the house/the book can be paraphrased as "being high"/"being on the table". The element "being" enlarges the negatable referent of the words involved in comparison with nonpredicative uses of the same words: it now includes time, so that it can subsequently be "unrolled". This effect of backward links, viz. of adding grammatical predicativity, is virtually unavoidable if the second element is accented (retaining a backward link!), i.e., if the latter is a "psychological predicate" in the present phase.

We saw above that attributive \textit{Adjective Noun} and \textit{Noun Adjective} can both be processed with a forward link. \textit{Verb Noun}, in contrast, cannot be reversed into *\textit{Noun Verb}: sentence elements which are to function as subjects or objects in the next phase cannot be linked forward to verbs in the present phase. Otherwise, the negatable referent of the verb would be a thing plus a predicative property, the noun or noun phrase "filling in" the identity of the thing. But verbs never include a thing in their negatable referent (cf. note 54 below).

The difference between \textit{Verb Noun} and \textit{Noun Verb} can be repeated; the verb can (in, say, Russian) first be linked forwards to a subsequent noun: \textit{Noun$_1$ Verb Noun$_2$}. The internal structure of the Verb-Noun$_2$ constituent is then of type 3.3; it can be turned into type 3.7 by postposing the verb: \textit{Noun$_1$ Noun$_2$ Verb}. Note that the verb is processed as a single element in the present phase; decomposing it into "valences" takes place in the next phase (although there are interesting interaction phenomena - see 6.2).

### 3.8 Backward link: accented second element

As we saw in 2.9, the ultimate negatability-reducing step in the present phase is interpreting the first accent in a backward-link configuration as a negation of a concurrent negation ("thematic"). This step retains sentential coherence if the latter is not otherwise guaranteed. Alternatively, a sentence boundary occurs. A number of subtly different cases precede these "last" possibilities; they pertain to various combinations of coinciding
and noncoinciding projections for the two accents involved and to the issue of whether sentential coherence in a backward scheme is already destroyed by a second accent interpreted with coinciding projections or only by a third accent following it. The cases cannot be listed exhaustively here, as interference effects with the next phase are intermingled with the issue, in a way not yet altogether clear. Correspondingly, it may in the future be necessary to modify slightly the definition of sentential coherence given in 2.6 above.

For example, in \textit{Noun}_1 \textit{Verb Noun}_2, an accent on the first noun more easily includes the verb and noun, in its scope when it functions as the subject than when it functions as the object (see 8.3 below): if word order has a role to play in subject/object differentiation in the next phase, that phase is “presumed” in the present one and affects accent interpretation.

The phenomenon underlying interaction effects in backward-link types with an accented second element is that such an accent has a “push-down” effect on the negation of the first element: in, e.g., \textit{VesNA naSTAla} “not vesna” and “vesna” no longer pertain to the same world state (as they do in \textit{VesNA nastala} - see Keijsper 1985: 313 ff. or 1986: 283-285), so that, according to the definition given in 2.6, sentential coherence is lost without further measures: the first accent is interpreted as a “last” accent. The standard “psychological content” measure (if no sentence boundary occurs) is to interpret the first accent as a “thematic” one, but often a shift to “logical”/“grammatical” content is made, so as to retain the “last accent” interpretation without destroying coherence. The push-down effect is then interpreted within the concept of time and negation of the next phase of processing. The first element is then interpreted as “agentive”, for example (see 7.6 below).

Often a second accent is needed merely to produce a “push down” effect on the interpretation of the first accent. Consider, for example, Dutch \textit{Hij BLOOST erVAN} (He BLUSHes beCAUSE of it). Here the relatively empty word \textit{van} is accented so as to preclude the interpretation of the accent on \textit{bloost} found in \textit{Hij BLOOST ervan}. The latter, as the verb is not in end position, applies both “not bloost” and “bloost” to a single “given” world state. It could be used, for example, as an explanation of why John never looks at girls. If, in contrast, John at a particular occasion sees an attractive girl, one could observe: \textit{Hij BLOOST erVAN}, where the verb introduces a new development as compared to a \textit{preceding} time: first John did not yet blush but, seeing the girl, a transition to a new phase is made. If, as in dependent clauses, \textit{van} precedes \textit{bloost}, an accent on \textit{van} is odd (being interpretable only as a correction of a mis-
take): ??omdat hij erVAN BLOOST. Here the verb itself is in end position, so that no accent is needed to overcome the contraction effect of nonfinal position. Note that this holds true independently of the fact that in the given sentences no other word order is possible: accent simply does its job on the basis of a given word order, irrespectively of whether this word order is opposed to another one. This implies that if languages with different word-order possibilities are being compared, while approximately the same interpretational effect is being aimed at, different accent placements will often be needed.

For example, in Russian Podnjalsja VETer the accent on the noun introduces, as we saw above, a new world state. If the sentence is translated into a Dutch or English sentence with Noun-Verb order, it is often better (with a view to a “closer” translation) to accent the verb; VETer podnjalsja and its Dutch/English translation is interpreted as involving a “given” (no longer negatable) world state (Look, the WIND has risen!). An additional accent on the verb eliminates that interpretation: The WIND ROSE then mimics the meaning of the Russian Verb-NOUN order in the closest possible way, with the help of accent.

In the same way (see Gussenhoven 1987: 28-31), English THIEVEs will be prosecuted is most obviously rendered in Dutch by Er zullen DIEven worden vervolgd. The contraction effect on accent interpretation in English (the sentence applying to a “given” world state) is made explicit lexically in the Dutch “er”, whose meaning gives the no longer negatable projection “the world”. English THIEVEs will be PROsecuted (IF there are thieves they will be prosecuted - cf. 3.6 above), in contrast, would be rather DIEven zullen worden verVOLGD, without er. Since in Er zullen DIEven worden vervolgd we have an additional word, viz. er, the sentence enters into other word-order oppositions than English THIEVEs will be prosecuted: its closest word-order partner is not DIEven zullen worden verVOLGD but DIEven zullen er worden vervolgd (see Keijsper 1987c). In this pair, it is Er zullen DIEven worden vervolgd which is closest to, e.g., Russian Verb-NOUN (cf. Er stak een WIND op vs. The WIND ROSE). The fact that it nevertheless is a translation of English THIEVEs will be prosecuted, i.e., NOUN-Verb, is due to the contribution of the meaning “er”, not of the meaning of the order er ... noun.

In all these examples, we are close to the next phase of processing. In Jan BLOOST erVAN the relevant borderline issue is the status of the transition between John’s not blushing and his blushing: if this transition is included in John’s life (his projected temporal extension), as it probably is here, it should belong to the embedded information of the present
phase, i.e., the accent on the verb should introduce a property (to be "unrolled" later) which includes the transition to (the initiation of), here, John's blushing (see 7.6 below and note 39). But if we have already entered the next phase, we "hold" the projection of John, so that we can "follow him through time", during the initiation of his blushing and during the blushing. This is an "illegal" operation according to the logic of the present phase: only projections without a separate correlate in the speech chain can be "held" (see 2.5), as the idea of extension is still embedded. But, as the example shows, when the logic of accent expires we cheat a bit. The first accent in Jan BLOOST erVAN can then be interpreted as a "last" accent without destroying sentential coherence, which is retained by means of the next phase.

In the case of The WIND ROSE, the second accent, like that in Hij BLOOST erVAN, ensures that we gain the impression that two stretches of time are opposed to each other, viz. when the wind was down and when it was "up", with a transition in between. This is an approximation of the word-order effect of Podnjalsja VETer (or of Er stak een WIND op), viz. the introduction of a world state containing the wind, with respect to a world state where the wind is absent.

There is no contradiction in the fact that the order er ... wind in Er stak een WIND op is a translation of Russian Verb-NOUN, whereas er in Er zullen DIEven worden vervolgd is an approximate translation of the "given" world state of THIEVes will be prosecuted (i.e. NOUN-Verb): in the latter case we translate the microscopic notion "world state" of the present phase, viz. the "largest" possible referent (no longer negatable in NOUN-Verb), into a macroscopic concept "the world", which is the basic "given" entity of the next phase of processing (independently of accent/word order). The microscopic introduction of a world state (Verb-NOUN) is quite compatible with the macroscopic idea that that world state is a development in the "given" macroscopic world. In short, we are crossing the subtle borderline between microscopic and macroscopic concepts of time.

3.9 Conclusion

As is clear from the examples given in this section, although a certain freedom of processing often exists (e.g., Russian noun - attributive adjunct), the choice of link and hence the degree of speech-chain contraction is not free. First, the hierarchies created by linkage must not contradict those of the next phase of processing, where many of the momentary referents created in the present phase disappear as separate things, be-
coming, for example, extensions of nonmomentary entities, the idea of extension presupposing something having that extension. In the present phase, the necessity of arriving at that ultimate hierarchy excludes forward linking of noun phrases to grammatically predicative elements; otherwise, verbs could not be translated into extensions of participants in the next phase. The ultimate hierarchy cannot be arrived at in the present phase, because here every sentence element must convey information that is negatable in the way required by accent; otherwise, the processor would be an outsider who only projects developments in the world but cannot create them.

Secondly, as we saw in 3.5, there are language-specific restrictions on the way grammatically predicative elements can be combined with other elements; since contraction reduces negatability from left to right, the degree to which the horizontal time dimension of the speech chain can be counteracted by mental operations in the present phase is restricted for elements where time must remain embedded until the next phase. In general, the tighter the connection between elements of the speech chain is, the less embedded time information an element can convey; however, the precise possibilities are different for different languages.

On the timeless-meaning level, language-specific possibilities must be formulated in part as different meanings of word order. For example, the general contraction effect does not explain why the semantic contribution of Russian verb placement differs from that in Dutch, or that English Auxiliary - Subject order has the meaning it has. A typology which takes into account linkage (e.g., French as a typical “forward linker”, colloquial Russian as a typical “backward linker”, etc.) must, in my view, ultimately replace current word-order typologies, which fail to take into account prosodic facts (cf. Keijsper 1985: 58-60), and confuse the word-order functions in the two phases of processing (e.g., by discussing subject/object (instead of noun phrase) placement with respect to verbs on a par with arrangements within noun-adjective combinations).

In my view, types of word (parts of speech) can at least to a large extent be defined in terms of processing potential or negatable referent. Thus I do not regard the traditional divisions as “given”, in which case they could be adduced as an explanation of their behaviour. Rather, I see what we call Noun, for example, as the name of a certain type of negatability; if we say that in A real NOTHing nothing becomes a noun, we observe that the basic, lexically determined, negatable referent does not include a thing (as in nothing REAL), but also that the meaning allows a certain degree of variation. Likewise, the behaviour of “I” and “you”
mentioned in 3.1 is characteristic of what we call first and second person pronoun. If we compare certain English prepositions with Dutch “phrasal verbs” (see Keijsper 1985: 344-356; 1987b: 190-192), we are talking about synchronic variation and historical changes in the lexically given “rank” of words in the negatability-reduction process (in this case, as a consequence of different development of verb placement in the two languages). If participles become adjectives, their negatable referent changes. And so on. The lexicon should give the information needed for sentence processing, but it, too, changes under the influence of processing regularities.

Language-specific possibilities for certain words must also be stated in the lexicon. For example, the different synchronic potentials of Russian ne and English not (see Keijsper 1986: 289, 360), although not random from a historical point of view, must be “given” for sentence processing to be possible. Furthermore, meanings of individual words (e.g., Dutch/English zo/so) must be described in such a way that the sentence-processing peculiarities follow from them (in this case: a relation with parallel links); cf. Bolinger (1987: 82) and Keijsper (1987b: 190).

Languages differ from each other with regard to whether a certain distinction is expressed by linkage in the present phase or remains word-inherent. For example, Russian bol’she allows three types of linkage in bol’she ne verb, which are rendered in English by more and anymore; the same holds true for many other Russian adverbs (see Section Four). In general, a great deal of freedom in the speech-chain-processing phase (as in Russian, especially colloquial Russian) may be expected to be accompanied by less specific inherent word meanings. I believe that such differences could fruitfully be used for typological classifications.

On the whole, sentence processing obviously uses information from a number of sources simultaneously. Correspondingly, my approach makes the division between “lexicon” and “syntax” flexible. Thus the meaning of accent can be stated as “not not” in the lexicon of signs, but in part it translates into a mental operation during processing. The same holds true for many other meanings, as illustrated in Part Two for verbs. But I would suggest that translation is never semantically neutral, and that the point in the processing mechanism where “inherent meaning” becomes “syntax” is not random. The meaning of verbs, for example, cannot be decomposed as long as the logic of accent is operative: the point where decomposition takes place depends on the sort of time and negation relevant to the meaning concerned. Language-specific differences on this issue are numerous. In this connection it would be interesting to know the precise meaning of particles in languages which are said to have no accent.
4. Towards the end of the logic of accent

4.1 Introduction

As we have seen, the world as it is created during the first phase of processing is a strange construct. In order to turn it into the world which we think exists independently of our mental operations, it must be transformed with the help of another concept of time and negation than the one which is operative during the first phase. The present section discusses a number of examples illustrating where, starting from the functioning of accent, the need for this other concept of time and negation arises.

4.2 Broadening one's "span": iterative

If one wants to see more of the world than a single world state at a time, the thing to do is to broaden one's "span of attention". The possibilities for doing so within the logic of accent are highly restricted, but there is one case in point which, with reference to Russian, I have called the "whole of potential occurrences of an event" (Keijsper 1986: 319 ff.). Consider, for example, *On ČAS to ne SPIT* (lit. He OFten not SLEEPS), where most potential occurrences of a sleeping event are absent but some are present. This "iterative" use of the Russian imperfective aspect involves the projection of a number of identical events which are taking place at different times, viewed "beside" one another, i.e., horizontally:

![Diagram](image)

This interpretation of the imperfective aspect in Russian interacts with linkage possibilities, because it resolves a conflict between speech-chain contraction and negation where the latter is expressed by a sentence element rather than evoked by accent, viz., in Russian, by the word *ne*. First, it must be recalled that the combination *Adverb Verb* (without *ne)*
illustrates type 3.2 above, i.e., the referent of the verb is construed as a separate potential point of attention. For example, *On KREPko SPIT* (He SOUNDly SLEEPS) conveys that he sleeps and that, in addition, his sleep is sound.

Now, if this same type is chosen in *Adverb ne Verb* it is the referent of the combination “ne verb” which is construed as a separate potential point of attention and which hence is negatable (viz. “not ne verb”). But the combination “ne verb” then becomes a single word, a new concept, comparable to English verbs prefixed by dis-: *to dislike, to disobey, to dissent*, etc., in other words something negatable in its own right, not, itself, a negation. For example, in *V strane xroNlčeski ne xvataet prodUKtov* (lit. in the-country CHRONically not suffices FOOD), “ne xvataet” functions as a single negatable concept (“to be insufficient” rather than “not to be sufficient”). That is, the accent on the adverb does its job given “ne xvataet”, whose truth cannot be affected by the adverb: food shortage could be not chronic but happens to be chronic. In this type (called “no link” in Keijsper 1986) “ne xvataet” enters the speech chain as a prefabricated unit, so that during processing no mental act is needed in order to combine the two.

If “ne” is to remain a separate - although clitic - word, the negation of the combination “ne verb” must be “verb”, i.e., an accent on the verb must evoke “verb” and negate this projection:

```
“ne” “verb” ----> “verb”
```

Here, as long as our “span” is a single occurrence of an event, the accent operation must be a mental operation only (noncoincidence, see 2.5): the event is first *thought* to be present and then *thought* to be absent; otherwise, “ne verb” becomes a new concept, as indicated above.

The link type ensuring that an accent on the verb does not introduce a new world state in *Adverb ne VERB* is a parallel link. For example (see 3.6 above), in *Ja vas DOLgo ne zaderŽU* (lit. I you LONG not shall-deTAIN), there are two complex projections of a single - no longer negatable - world state so that, in effect, the sentence does not convey whether or not detaining takes place: both possibilities are left open in application to the same world state (IF I am detaining you - but possibly I am not - then it will not last long). As we saw in 3.6, parallel links here allow perfective aspect to be used with durative adverbs, even in the preterite, e.g., *On [direktor] DOLgo ne proderŽAlja* (lit. He [the-director] LONG not LASTed) (Ogoněk 25, 1991). This is the aspect reflection of the fact that only a single occurrence of an event is at stake.
Now the “iterative” interpretation of the imperfective aspect enables us to make a combination which is impossible as long as our “span” is restricted to a single occurrence of an event; we retain “ne” as a separate, clitic word, i.e., with “verb” as the negation of “ne verb”. These projections pertain to the same time, just as in the parallel-link type, so that the accent operation is a mental one only and “ne verb” does not become a new positive concept; nevertheless, the event is in reality both absent and present, viz. at different times. Upon reflection, we see that this is possible only if these different times are viewed beside each other, i.e., horizontally:

![Diagram](image)

For example, in On ĆAS to ne SPIT, “it is often the case that he doesn’t sleep”, we neither have a parallel link (which would result in the interpretation “he doesn’t often sleep” - this possibility does not, as far as I know, occur with Ćasto), nor do we transform “ne verb” into a new concept (cf. “*it is often the case that he dissleeps”). This is possible by choosing a “span” which ensures that a number of occurrences rather than only a single one are visible (see the schematic picture above); individual occurrences are then negatable in the way required by accent, i.e., by mentally “lifting” them “up” (vertical negation) from where they are. But the idea that “ne verb” and “verb” apply to the same time is now arrived at not by choosing a nameless world state p as the focus of attention and retaining that projection while “verb” is mentally replaced by “ne verb” (as with a parallel link), but by viewing time horizontally.

The case ADverb ne VERB has a borderline status in the logic of accent because the links indicated are possible only by virtue of the fact that a horizontally viewed time dimension which normally remains embedded in the realm of accent is taken into account (but see below).
surprisingly, then, the Russian solution using aspect interpretation to solve a time conflict during speech-chain processing is language-specific. English, for example, translates the conceptual problem into lexically different adverbs. Compare, for example, On počTI SPIT (He ALmost SLEEPS) vs. On počTI ne SPIT (lit. He ALmost not SLEEPS, i.e., he hardly ever sleeps); On ešče SPIT (He still SLEEPS) vs. On ešče ne SPIT (lit. He still not SLEEPS, i.e., he doesn't SLEEP yet); and so on. (See the English translations of examples in Kejisper986 (323 ff.); Bolinger (1960 and 1977: 21-36) discusses the English problem in connection with the putative some-any rule of Generative Grammar at that time.)

The example of Russian imperfective aspect interpretation in negative sentences shows that broadening one's “span” beyond a single world state, so that time is viewed horizontally, can be combined with the idea that accent operates vertically. What makes the combination possible is the fact that the identical occurrences used in the example are different tokens (imperfective aspect being interpreted “quantitatively”); as long as this is the case, the horizontal dimension, although time, can be projected in a single moment (“statically”) and referents can be mentally removed vertically.

4.3 Broadening one's span: nonconcurrent parts

One further step leading to the end of the logic of accent is the idea that a single referent is extended in time. The next example introduces that idea. It is concerned with what I have called “nonconcurrent parts” (Kejisper 1985: 282 ff.; 1986: 286-287, 349-357). Nonconcurrent parts as relevant to accent can be represented schematically as follows:

Suppose we have a pie which becomes progressively smaller as parts of it are eaten. Now, in the picture, the various parts do not constitute a whole: they add up to more than a single pie. As far as accent is concerned it is therefore impossible to choose a span comprising all parts of the picture and negating one of them vertically: accent sees only one part at a time; viz., for example:
Given such a span, the problem for accent is that "lifting up" a piece of the pie (vertical negation) brings us to a projection of the vertical layer under the piece unless the procedure of noncoincidence (2.5) is applied. But if removing a piece brings us to another vertical layer, the piece no longer is a part of a whole but a separate thing with its own identity (a separate potential point of attention), i.e., a separate "corpuscle". The latter is what happens in A real NOTHing (see 3.2), where "nothing" refers to a thing which, when "lifted up", leaves us with a projection of the layer under it ("space"). A noncoincidence interpretation may be seen as the "normal" interpretation of last accents on quantifiers. Thus in the example EVerybody went home, we understand that some unidentified quantity of people went home (referent no longer negatable, fixed point of attention), "everybody" providing the identifying property of the quantity concerned. Then, of course, the accent does not include the rest of the sentence in its scope, as "everybody" does not introduce a new point of attention. Likewise, in The hill is not TWO hundred feet high, but THREE hundred (Jespersen 1966: 81), "two" and "three" are alternative projections of the same unidentified height of the hill.

A parallel link provides the "unidentified thing" projection in the two-accents case. The resulting interpretation is that of ALL that glitters ISn’t gold, i.e., IF there is some (unidentified) quantity of things that are gold, "all" is not the appropriate identification of that quantity.

All this remains within the logic of accent, the "unidentified thing" projection which is "held" during the accent operation ensuring that the quantifier concerned has a negation in the same vertical layer (part/whole organization) instead of becoming a separate thing with its own identity (figure/ground organization). But the procedure remains a microscopic one, the "span" of accent being restricted to a single piece of a pie.29
If we want to see the whole made up of nonconcurrent parts, we must broaden our span in the following way. The pieces of the pie as pictured above are the pieces which remain when we eat a piece of the pie every now and then, i.e., they result from something happening in between; every time we eat a part of the pie, the remainder becomes smaller. Now, instead of projecting what remains after eating, we can look at the pieces being eaten; together, they add up to a pie:

\[
\begin{align*}
\text{\includegraphics{pie_pieces.png}}
\end{align*}
\]

Such wholes are not normally visible to accent (see below); in the case of quantifiers this is a borderline possibility. It is the projection we use in the example *The hill is not TWO hundred feet HIGH* in the sense “The hill is less than two hundred feet high”, or in *NOT everybody* (but fewer people) *went HOME*.

The problem of accent in the case of a whole arrived at by taking together the transitions between nonconcurrent parts is that parts of such a whole are normally thought of as removable horizontally, i.e., by placing the end-point of the continuum elsewhere and changing one’s span accordingly:

\[
\begin{align*}
\text{\includegraphics{whole_diagram.png}}
\end{align*}
\]
This act of negating is impossible in the logic of accent: from the point of view of accent, a part here “adds to” a smaller part, i.e., is the transition resulting in a larger part. Accent cannot handle that case, because from the point of view of accent the observer here is looking at a stretch of the continuous horizontal time dimension which he has eliminated by his contraction operations upon the speech chain, i.e. something which does not exist in the microscopic world of accent. As the example shows, the stretch is a certain \textit{extension} between boundaries in the realm of referents.

As long as we remain within the concept of negation normal for accent but take the scalar whole, a “less than” idea requires the following operation. We start from a projection of a certain positive quantity, say, “everybody”:

Then, \textit{retaining} the same span, we mentally remove a \textit{part} of the quantity \textit{vertically}, so that less remains and we have a projection of the absence of the remainder (because our span is unchanged):
The projection “not everybody” arrived at in this way cannot normally be evoked by accent; given some “x”, “not x” evoked by accent projects the absence of the entire x or (noncoincidence procedure) the absence of the identifying property of the entire thing projected, so that an unidentified thing remains. As we saw above, the former turns the referent into a separate “corpuscle”, and the latter is the normal procedure for last accents on quantifiers. Both are microscopic.

Next we take a quantifier combined with a negation expressed in the speech chain, for example not everybody. As we saw in 4.2, in negative sentences the accent procedure can be reversed, as it were (see Keijsper 1986: 301-304), so that we might be inclined to regard “everybody” as the negation evoked by an accent on not everybody:

```
“not” “everybody”  
“everybody”     
```

But if not everybody means “less than everybody”, this accent operation is illegal in the manner explained above; the vertical operation involves only a part of the referent of “everybody”, not the entire referent or its identifying property (see the picture above). Thus applying this procedure in, for example, NOT everybody went HOME we slightly distort the meaning of accent (Keijsper 1986: 349-351). We retain the idea that an accent can project the absence of the identifying property of something: we have deprived a part of a whole of its identifying property (changing it into another part) by removing a part of a part. This possibility does not exist with nouns: a chair, for example, remains a chair if we remove one of its legs; it becomes a chair with one leg missing, but even when broken, it is still categorized as a chair. So on the one hand, the “less-than” reading can simply be seen as the effect of applying to scalar meanings the noncoincidence procedure normal for accent. In addition, by not changing our “span” during the accent operation (see the picture), we ensured that accent can do its job vertically (by mentally “lifting up” a part); in other words, we retain a projection of the same “place” (in contrast to the case where we change our span). But on the other hand, “less than everybody” or “less than two” does not equal a “not x” evoked by an accent on a positive x (see above), so that in the case of negated quantifiers in the “less-than” reading, the accent operation is not really reversed.

Not surprisingly, then, sentences containing negated quantifiers in the “less-than” interpretation exhibit a number of language-specific peculiarities in the speech-chain-processing phase (Keijsper 1986: 351-357; to
be investigated further); these reflect the transitional nature of the semantic type; in the macroscopic world to be discussed in Part Two, we will use the horizontal (span-changing) mental act indicated above, not the vertical one of accent.

In Russian, negated quantifiers - and adjectives - in the "less-than" reading tend to become new lexemes: nemnogo (rather than *ne mnogo*) (not-much), nemalo (not-little), etc. (But *ne vse*, (not all), *ne vségda* (not always), etc., vs- being the borderline case between parts of wholes and independent wholes.) This eliminates the problem of whether "mnogo", "malo", etc., are the negations of "ne mnogo", "ne malo", etc., in the "less-than" interpretation, in other words, whether an accent on the latter can evoke the former. Thus "nemnogo", "nemalo", etc., are treated as new concepts, negatable in their own right, just as "ne xvataet" discussed above. In effect, we then have *ne* compounds in the lexicon with a "less-than" meaning, alongside syntactic combinations of "ne" with quantifiers in other interpretations; the processing problem has been translated into a lexical difference (cf. the English solution to the comparable adverb problem mentioned in 4.2).

Furthermore, the "less-than" type tends to be restricted to nonlast accents, as in English. (The last accent case is a noncoincidence type, i.e., involving a projection of an unidentified quantity.) With nonlast accents, the processing problem is then whether the resulting sentence comes under the heading of parallel links, i.e., whether the span as given above in the picture counts as the "p" of the scheme in 2.8; otherwise, the type must be a backward link. In Russian, this linkage problem is reflected in the fact that the "less-than" type (sometimes?) allows the perfective aspect in circumstances where this is otherwise impossible (reminiscent of parallel links - see 4.2): *Za ves' VEČer on i DVUX SLOV ne skazal* (During the whole evening he did not say - perfective - two words): the perfective aspect is possible, despite the "durative" *za ves' večer*.

In Dutch, combinations such as *niet iedereen, niet alles* resist a nonlast accent on the quantifier: we say *NIET iedereen ging naar HUIS* rather than *Niet IEDEereen/iedeREEN ging naar HUIS*. This preference eliminates the choice between a parallel link and a case of "overlapping constituents" - see Keijsper (1986: 351-353). In addition, if the *niet* - quantifier constituent in first position is not the subject, Dutch has the problem of whether the Verb - Subject order following it has the reading of the English Auxiliary - Subject order, as it has in parallel link cases (e.g. *In not many years will Christmas fall on a Sunday*), or that of the English
Subject - Verb order, as it has with backward links (e.g. *In* not many years *Christmas will fall on a Sunday*). In effect, a sentence like "NIET vaak gaan ze op vakantie" is questionable, *Ze gaan NIET vaak op vakantie* being the normal choice.  

English has no problems with the Auxiliary - Subject order here, but it does have other restrictions in the same area. Payne (1985) discusses these for English and a number of other languages.

All this shows that the "less-than" interpretation of negated quantifiers is a borderline case between the vertical - accent - type of negation and the "horizontal" mental act indicated above: the latter is the act characteristic of the "macroscopic perspective" towards which we are moving.

### 4.4 Other part/whole cases

If we now take "less-than" readings in cases where accent sees different potential points of attention (separate "corpuscles"), we definitively leave the realm of accent for the "horizontal" act of negating. We may start from so-called "constituent negation" involving a verb: *On ne čitaet, a smotrit televizor* (lit. He not READS, but watches TELEvision); *On ne ubil ee, a ranil* (lit. He not KILLED her, but WOUNDED her), etc. Such sentences illustrate the negative variant of the noncoincidence procedure of 2.5 (plus the negative variant of the type of inference usually called "contrastive accent" - see Keijsper 1986: 304-305). There is some given event, but its identifying property is not /čitaet/ or /ubil/, but some other property (specified in the *a* phrase).

But consider then *On ne ubil ee, a tol'ko tjaželo ranil* (lit. He not KILLED her, but only SERiously WOUNDED her) (Keijsper 1986: 364). Here we are not concerned with a given event which is first - incorrectly - projected as "ubil" and then as "ranil", but with an event consisting of various phases, "killing" being "more" of the same event than "wounding". Accent is totally insensitive to the difference between this sentence and the normal sentential negation *On ne ubil ee*, i.e., "the event of killing was absent". Accent cannot "see" the larger whole of which "wounding" and "killing" are a part; it treats "killing" and "wounding" as two separate, unrelated things.

The case brings us one step further than the quantifier case of 4.3: there we can, with some effort, remain within the idea that accent functions by means of a static observer looking "in depth": in 4.3 we removed a part vertically, retaining the same span. Where quantifiers are concerned this is fine, because such words have a negation in the same vertical layer (noncoincidence, part/whole organization) in the procedure which is
“normal” for them as well. But in the “killing”/“wounding” example, we are dealing with separate “corpuscles” as far as accent is concerned (separate potential points of attention). If in such a case we want to see the referents as parts of a single whole, we can only make use of a macroscopic whole, removing a part horizontally, by mentally moving the boundary of the referent to another place and by changing our span accordingly. This means that, as we remove the part, we do not retain a projection of the “place” where that part was before we removed it, i.e. “not x”; instead, the projection of the part is absent, rather than that we have a projection of the absence of the part.

This idea of variable extension and a changing observer’s span cannot be formed within the boundaries of the logic of accent: the parts involved are parts of a whole rather than separate things, not because their vertical negation pertains to the same vertical layer (as accent would have it), but because they do not have their own boundaries. However, from the point of view of accent, extensions between boundaries are stretches of continuous time or space. The processor cannot see such referents as long as he is eliminating the continuous time dimension from the speech chain. But after that, such referents are visible. The act of projecting them belongs to the logic of the macroscopic world. The examples mentioned above and in 3.8 illustrate the point where that world can no longer be avoided.

In the case of entities, the possibilities of accent end at the same point. Consider, for example, - How’s your new BOOK going? - Well, I’ve just written the introduction. The answer has an accent on introduction irrespective of the fact that the introduction can be construed as a part of the book; as far as accent is concerned, the example does not differ from - How’s your new BOOK going? - Bad, I’ve just bought a computer (or anything else). Accent recognizes a book, an introduction, a computer, etc., as different things, each with its own identity; it is unable to see any larger-scale organizations between these things, because the latter involve the horizontal mental act illustrated above, i.e., in the example, the idea that books have a spatial extension. In fact, from the point of view of accent, characterizing properties are already separate things (see 3.2), i.e., accent recognizes only the microscopic perspective sketched above.

In the same way, accent does not “see” the fact that in The car broke the window with its fender (Fillmore 1968: 23) or The machine brushes the floor with a rotary brush (Starosta 1978: 490) the fender/rotary brush can be construed as a part of the car/machine, viz., now, as contained
within the same boundaries. This fact is, therefore, irrelevant to accent and word order in its "psychological" use - see Keijsper (1988: 372-375, 378-379) for the borderline case. It is, however, relevant to the interpretation of a sentence in terms of semantic roles; in the examples, choosing a part/whole organization ensures that the grammatical subject can be interpreted as nonagentive. By contrast, in the example *John broke the window with a hammer*, construing John and a hammer as separate entities leads to an agentive subject interpretation (see Keijsper 1988 and 7.9 below).

The entities involved here are not the same as the "corpuscles" of the microscopic world; they are things which retain their identity through time, i.e., things which have a life of their own. Then combining such entities in a part/whole combination (or figure/ground - see 6.6 below) ensures that they can be followed through time simultaneously (within a single act of projecting temporal extension); this is the macroscopic parallel of combining more than one element of the speech chain into a chunk of information. Construing entities as separate things (John, hammer) ensures that they cannot be tracked through time simultaneously; this is the macroscopic parallel of forming two chunks of information (backward link), and the agentive subject interpretation in the example corresponds to "thematic" accent interpretation in the microscopic perspective, in that both ensure that coherence is retained in the given circumstances. The underlying principle is, in my view, the same in both cases, but the concept of time and negation within which this principle is applied differs. Just as accent interpretations can be brought under a single heading, given a processing mechanism which varies the negatability of referents of elements of the speech chain, "semantic roles" become interpretational categories by the mechanism which varies the "degree of transitivity" during the "macroscopic" phase of processing, to which we now turn.
PART TWO: THE WORLD ACCORDING TO VERBS

5. Non-existential vs. existential verbs

5.1 Introduction

At the end of the possibilities offered by accent the suspicion arises that there is a macroscopic world based on the “span-changing” type of mental act introduced in Section Four; in that world, time runs horizontally with respect to the observer. If we want to see all of that world, the world stack created during the speech-chain-processing phase must be projected with the help of these new ideas. When we do so, the result is a complex projection of a macroscopic world extended in time, in which entities exist, do things, cause each other to do things, etcetera. This world is the well-known world of “grammatical” and “logical” content.

At first sight, the transformation of the microscopic world of accent into this macroscopic world seems to simply reverse the direction of the procedure: we build a new “chain” and “accents” operating on it out of the vertically layered world of accent, with the help of an observer who, instead of looking statically “in depth”, dynamically enlarges his span horizontally.

If this impression were correct, the processing mechanism of Part One would describe what a hearer does, and we could now simply reverse the story for the speaker. In reality, however, both hearer and speaker must go through two phases of processing (in opposite directions), because the corpuscles of the microscopic world embed the macroscopic world, so that these corpuscles must be “unrolled” before we can see the latter. The illusion of reversal is so powerful, however, that the “unrolled” world is easily confused with the phase of speech-chain processing.

Part Two discusses some examples of this confusion, or, to put it more positively, combinations of choices from different content areas which are likely to be statistically preferred; these illustrate the main correspondences and differences between the two phases.

The correspondences result from the fact that different types of verb embed the macroscopic parallel of different steps of the mechanism summarized in Section Two above. The differences are a consequence of the fact that the Section Two mechanism operates with a verb processed as an element of the speech chain (occurring in time, having a referent negatable in the way required by accent, etc.), while the macroscopic perspective decomposes the verb itself, in time.
The present section discusses two basic cases of decomposition (non-existent and existential verbs); they have different associations in the speech-chain-processing phase. Section Six treats the differences between microscopic corpuscles and macroscopic entities and the concept “span of entities”, which corresponds to a chunk of information in the speech-chain-processing phase. Section Seven lists some basic distinctions in the process of verb decomposition. Finally, Section Eight compares some aspects of the picture arising from the discussion with the traditional view of Subject/Object and with proposals put forward within recent versions of Generative Grammar.

As the reader will notice, Part Two in no way pretends to be a complete treatment of the area of “transitivity”; I hope that it can nevertheless serve as a starting point for future detail studies.

5.2 Basic act of unrolling

Consider the sentence Zanaves podNJALsja (The curtain ROSE). The output of the speech-chain-processing phase for such a sentence is, as we saw in 2.9, two momentary things in the same horizontal position, the noun corpuscle no longer negatable, the verb corpuscle added to it by the accent on the verb. As long as referents are negatable, as the verbal property is here, the processor is creating the microscopic world. But having done so, he can devote time to the projection of his own creation.

Imagine that the verb corpuscle is a clock; the accent on the verb adds this entire clock “in one go”, as a single corpuscle, the referent of “not verb” being the absence of the clock. Devoting time to the projection of the result of the microscopic phase then amounts to “holding” the projection of the curtain while mentally “unrolling” the clock into, roughly (see note 37), a part “being down”, a part “going up” and a part “being up”.

In doing so, the processor forms a projection of part of the curtain’s temporal extension, a part of its life. The “hold” operation ensures that the processor can decompose (“unroll”) the verb clock (time-embedding microscopic corpuscle) in mental time; otherwise, he could only “scan” a clock decomposed beforehand.

Just as in Part One, holding a projection reduces negatability: in the example, the curtain becomes a macroscopic entity the fact of whose existence in time is presupposed; otherwise, it could not be projected during some time.

Decomposing the verbal property in mental time is not a semantically
neutral operation either: it "disembeds" macroscopic time, just as the translation of "not not.x" into

\[
\begin{align*}
\text{"x"} \\
\text{"not x"}
\end{align*}
\]

disembeds the microscopic time embedded in the meaning of accent (see 2.3). The new disembedding ensures that the formerly embedded, macroscopic time is no longer negatable but "always with us", even if we are not actually forming a projection of it; in the example, the curtain is also viewed in this time (exists in this time) although it is not itself a stretch of time.

This simple example may suffice to illustrate the sense of the storage procedure of the speech-chain-processing phase: the words zanaves and podnjalsja start as mental states in the speech chain (the processor disregards the time between the begin and end point of words - 2.2); these states become simultaneous projections by translating the transitions between them into mental acts which eliminate the continuous time dimension of the speech chain; having stored the information, the processor can project the result of the first phase in continuous time without bothering about speech time. Needless to say, this procedure is very fast and unconscious.

Through the procedure the processor tricks himself into believing that he is only forming projections of the outside world, and is not responsible for the existence of that world; he eliminates the effect of his own operations in the speech-chain-processing phase by - in our example - merging two corpuscles into a single macroscopic entity and its projected temporal extension; vertically there is nothing "in between" the entity and its extension: microscopic "depth" disappears by holding the first corpuscle (just as that depth is absent in the smallest microscopic noncoincidence case - see 2.5 and 3.1 ff.).

This merging does not count as a mental act of the processor; it is the automatic result of shifting from one sort of time and negation to the other. Only mental changes within a single perspective count as mental acts. Thus in the microscopic perspective the example contains two separate corpuscles, one mapped onto the other; in the macroscopic perspective they are merged, but within the latter perspective, there is no change between a mental state in which two macroscopic entities are viewed as not identical and a mental state in which they are identical; instead, holding the projection of the curtain while unrolling the verb implies that it is the temporal extension of the curtain which is being projected. Thus
unrolling the verb while holding the projection of the curtain results in an implicit identity relation between the two.\textsuperscript{35}

5.3 Confusion

The act of forming a projection of a stretch of time introduces an opposition between two mental states; before the act the projection of the stretch was absent, after it the projection is there: the processor forms a "new" projection. This act, which is present in all grammatically predicative sentences, is the macroscopic parallel of a last accent, which, in traditional terminology, turns a word into a "psychological predicate".

All grammatically predicative sentences are developed into a projection of a stretch of time, but the content of the verb clock differs. In Zanaves podnjalsja, the content is easily confused with the effect of an accent on the verb, because it consists of a transition ("going up") between two states ("being down" and "being up"):

\[ \text{down} \xrightarrow{\text{up}} \]

This is, of course, close to the microscopic

\[ \text{"podnjalsja"} \]
\[ \text{"not podnjalsja"} \]

The macroscopic picture, then, appears to be the microscopic constellation looked at "from aside" rather than "from above" (or rotated 90° with respect to the observer), viz.
In reality, the macroscopic construal does not "look at the accent arrow" of the microscopic phase but "inside" the clock created by the processor in that phase, the transition being a part of the curtain's projected extension, not a creative act on the part of the processor. In general, all transitions within the macroscopic complex referent must be included in the extension of some entity; otherwise, the processor would be creating the macroscopic world instead of forming projections of it.

More specifically, note that the "being down" part of the clock is a different negation than that evoked by accent: the latter negates the entire clock while the former remains inside the clock. Thus, a microscopic processor operates with a vertical concept of negation in a fixed span (corresponding to the notion "a projection of the absence of x", where x is the entire clock). A macroscopic processor does not know that in the previous phase the entire clock was negatable, because he can only horizontally change his span, while remaining inside the clock. When he reduces his span, he does not retain a projection of the "place" which was projected when his span was different; the projection concerned is simply absent. Thus the "not x" of accent negating a nonconcurrent negation plays no role in the macroscopic perspective (i.e., we have no time running vertically with respect to the observer).

The "being down" phase of the clock is part of the life of the curtain through the use of the perfective aspect (through the projection of the transitional stretch plus its final boundary). It can be called the noncontiguous negation of the "being up" part.

Note that the noncontiguous negation of the "being up" phase is represented by placing it beside the resulting stretch, in a different vertical layer (i.e., with a transition in between). The representation symbolizes the fact that we are now dealing with a "dynamic" observer, who projects stretches of time one after the other; in all these stretches time runs horizontally with respect to the observer. The microscopic idea that things viewed "beside" each other belong to the same time (world state), so that one of them cannot be the absence of the other (as in "Thematic" accents) has disappeared. Further, in the microscopic construal of Zanaves podja, there are two corpuscles, because the processor does not "hold" the projection of the curtain while he replaces "not verb" by "verb". Construing the macroscopic picture he does hold the projection of the curtain while he unrolls the clock, so that the vertical layering between the two disappears (implicit identity relation), and the transition between the "being down" and the "being up" phase of the clock is included in the projected temporal extension of the curtain.
The hold operation is the macroscopic parallel of the microscopic procedure of holding a projection of an unidentified thing, without a separate correlate in the speech chain, while filling in its identifying property. As we saw in 2.5, the latter ensures that the thing whose projection is held is excluded from the negotable referent of the word concerned. In the macroscopic phase it is a fully identified thing (with a separate correlate in the speech chain) whose projection is held, and the verbal property is a characterizing one (cf. note 52). The macroscopic procedure also reduces negatability; as indicated above (5.2), the fact that, in the example, the curtain exists in macroscopic time (that its projection can be held) is presupposed by the verb rather than conveyed.

The “given” status of macroscopic entities whose projections are held is easily confused with, in Zanaves podnjalsja, the effect of the backward link and the accent on the second element: the first corpuscle is then no longer negatable in the microscopic phase either (see 2.9). However, the macroscopic “given” status is compatible with, e.g., Smotri, ZAnaves podnjalsja! (Look, the CURtain has risen), where the first corpuscle is added to the world stack by the accent, i.e., “new”. Below, we will see examples of “new” macroscopic entities: the verb conveys that they exist or come into existence (“existential verbs”). The latter are easily confused with the effect of an accent on the noun concerned, especially with Verb NOUN order. But here, too, microscopic and macroscopic distinctions are in principle independent. In short, two “cycles” of negatability reduction must be kept apart.

Note finally that the curtain does not have the status of a macroscopic entity whose existence in macroscopic time is presupposed before the verb is decomposed (“unrolled”). In general, as we saw in 2.4 above, accent cannot “see” the difference between, e.g., John is a lawyer and John has a lawyer, or the difference between John made me a hamburger, John made me a star, John made me a good husband, etc. Such differences appear only when the verb is decomposed and is not, itself, a “corpuscle” occurring in time.40

5.4 Terms

For want of a better term, I will call the mental time needed to project an entity’s temporal extension macroscopic projection time. Macroscopic projection time is concerned with lasting projections: it makes use of the ability to keep one’s attention fixed on something for a certain period of time. The thing whose projection is “held” during such an act will
be called locus of attention; this is a macroscopic entity (see Section Six for the difference with a microscopic corpuscle). The projection which is formed by projecting a locus of attention for a certain period of time is a projection of its temporal extension (of a part or all of its life), but not of the fact that it has a life; the latter projection is presupposed (no longer negatable) by using something as a locus of attention. Both the locus of attention and its projected extension are developed out of the microscopic corpuscles or layers, viz. by holding the projection of one of them while "unrolling" another.

5.5 "Existential" vs. "presentative"

Even if we leave aside impersonal sentences and "weather" type sentences (It rains), not all grammatically predicative sentences contain a prototypical, presupposed, subject entity such as we find in Zanaves podnjalsja. Consider Podnjalsja ŠUM (lit. Arose NOISE). In the most likely interpretation, the noise did not yet exist before it "arose": it is an "effected" rather than an "affected" subject. The verb is used as an "existential" verb here, conveying rather than presupposing the fact that the subject entity has come into being: the "being down" phase of the clock coincides with the nonexistence of the subject entity, the "going up" phase with its coming into being, and the "being up" part with its full existence. (In Zanaves podnjalsja, in contrast, all phases of the clock presuppose the curtain's existence.) Many verbs have, as podnjat'sja, both possibilities; for "to be" they are the "existential" and the "locative" use. In Russian they are associated with Verb NOUN and Noun VERB arrangement, respectively.

If the existence of the subject entity is not presupposed by the verb, we cannot use this entity as a locus of attention while unrolling the verb (as it does not yet exist). Instead, we need a third thing, not mentioned in the sentence, with the help of which the entire verb/subject complex can be "unrolled". This other thing is "the macroscopic world".

In the microscopic perspective, when discussing Verb NOUN sentences (see 3.5 above), I introduced the concept of a sequence of world states looked at from above, where accent replaces one world state by another:

```
verb" "noun"  ---  world state 2
"not noun"    ---  world state 1
```

In other words, the negatable referent of the noun phrase includes the microscopic referent ("world state") which comes closest to the macroscopic idea of time. The macroscopic view of Podnjalsja ŠUM, just as
in Zanaves podNJALsja, seems to project the microscopic constellation “from aside” (or by rotating it 90° with respect to the observer), i.e., the verb seems to refer to what is in between the world states of the microscopic perspective, viz. to “that which introduces” the subject noun (the accent arrow). Again, this is an illusion: in the microscopic construal the verb, just as all other sentence elements, can only be in one layer or another, not in between; as we saw in 3.5, the verb provides the identifying property of the world state introduced by the accent on the noun, i.e., by the processor.

In other words, the accent conveys: “first we had the world state defined by the absence of the-noise-having-“arisen”; now we have the world state defined by the presence of that complex”. The macroscopic picture then results from decomposing, in macroscopic projection time, the complex introduced by the accent; when it has been decomposed, the idea that the processor can introduce a new world state disappears. Instead, the macroscopic perspective starts from the fact - presupposed, not conveyed - that the world exists in macroscopic time, and time flows by itself: the processor has no power over it but can only form a projection of some part of it, here of the transition between the state when the noise did not yet exist to the state when it does, plus - at least - the end-boundary of the transition.

In the macroscopic perspective a projection of the fact that the world exists in time, i.e. has a life, cannot be absent: the idea that this fact could be negatable necessarily involves the idea of a creator outside the macroscopic world, i.e., God, or, in our simple linguistic case, the processor of a sentence; but when we construe the macroscopic world as created from outside, we are not inside the macroscopic time concept.

Depending on the verb (or verb variant), projections of the fact that other entities exist in time can acquire the same “presupposed” status as the projection of the fact that the world itself exists in time (e.g., the curtain in the example Zanaves podnjalsja). This is a matter of negatability reduction within the macroscopic perspective. Given our new macroscopic concept of time, the steps within that perspective can systematically be compared with the microscopic steps of negatability reduction, and are easily confused with them. Thus the macroscopic phase as a whole is a further cycle in the process of negatability reduction which started with speech-chain contraction: the cycle starts from a projection of the fact that the macroscopic world exists in time, the continuous time in which it exists being “always with us” (non-negatable).
5.6 Confusion

Sentences containing existential verbs (or verb variants) closely associate with, in Russian (see note 41), Verb NOUN arrangement, because in that case in both perspectives the time containing the referent of the noun is opposed to another time, when it was absent. (In the macroscopic phase it may be only the projection of the time concerned which was absent.) However, the microscopic construal opposes two times to each other by including a momentary world state in the negatable referent of the noun (in contrast to NOUN Verb), whereas the macroscopic perspective can, as a consequence of verb meaning (plus aspect), oppose a projection of a stretch of time defined by the non-existence of the thing concerned to a projection of a stretch of time defined by its existence, all stretches being part of the life of the world.

The “presentative” effect of the Verb NOUN arrangement must be distinguished from the existential type of verb (or verb variant): arrangement and verb type vary independently. Of course, the microscopic and macroscopic types of information tend to be congruous, but that notion is highly flexible: the combination must make sense.

For example, in Pozvonila tvoja MAT’ (lit. Called your MOTHER), the accent introduces a world state containing Mother with the property of having phoned (“presentative”), but Mother existed in the macroscopic world independently of whether or not she phoned (“affected” subject, the “unrolled” verb referring to part of Mother’s life without conveying the fact that Mother has a life). The obvious interpretation of the combination is that the call is an incoming one, i.e., it makes sense to introduce a world state which contains Mother because she “entered” from elsewhere. Faber (1987: 349) correctly makes this observation for English NOUN Verb; Russian has an additional opposition here, cf. Here’s MOTHER vs. LOOK, MOTHER’s here.

In general, the “presentative” arrangement is “congruous” with any verb compatible with the idea (see 3.5 above) that the verb “fills in” (gives the identifying property of) the world state introduced by an accent on the noun. This includes existential verbs and non-existential verbs referring to activities that can be interpreted as directed towards the observer/perceiver: Nastala vesNA (lit. Came SPRING), Voznikajut novye goroDA (lit. Arise new CITies), Razdalsja zvoNOK (lit. Resounded a-BELL), Nadvigalsja DOŽD’ (lit. Drew-near RAIN), Priexal IVAN (lit. Arrived IVAN), Zalajala soBAka (lit. Started-to-bark a-DOG), etc. But the arrangement is by no means restricted to such verbs: world states can be introduced which consist in the elimination/disappearance of a
macroscopic entity (*Končilas’ vesNA* (Lit. Ended SPRING), *Isčez SAxar* (lit. Disappeared the-SUGar), *Uexal IVAN* (lit. Went-away IVAN), etc. “Agentive” verbs are also possible: *Igraet MAL’čik* (lit. Plays a-BOY), *Guljajut LJUdi* (lit. Walk PEOple), etc. Statistically, the frequency of *Verb NOUN* can be expected to diminish in the order of the verb types indicated here, but all verb types can in principle occur in this arrangement.

Nor are existential verbs restricted to presentative arrangements. True, in *Noun Verb* arrangements containing existential verbs, the last accent is often on the noun phrase (so that the corpuscle developed into a “new” macroscopic referent is first introduced in the microscopic world stack): *Ogromnaja kristal’naja JASnost’ isxodila ot etogo čeloveka* (lit. A-huge cristal CLEARness went-out from that man), *Trevoznoe volNEnie ras-prostranilos’ po vsemu domu* (lit. An-alarming eMOTion spread over the entire house), etc. But that is by no means a necessity: *TUči zakryli NEbo* (lit. CLOUDS covered the-SKY), *Sinie TEni legh pod glaZAmi* (lit. Blue SHADows lay under (his/her) EYES), etc.

A common use of *Noun VERB* with existential verbs is illustrated by the following: *Vesna (nakonec) naSTAla* (lit. Spring (finally) arRIVed), *Vybomaja kompanija nacaLAS’* (lit. The election campaign beGAN), etc. Here we understand that the subject entity was expected to appear (it is no longer negatable in the microscopic construal), the accented verb conveying that it has indeed done so (so-called “verificational” sentences).

Čagina (1990: 6, 11-12) excludes the type (last accent added) *Neobxodimost’ v operacii byla VYzvana* (The necessity of an operation was eVOKed), because, I would say, this sentence is likely to occur only in a context where “byla vyzvana” is opposed to, e.g., “did not appear automatically”. More “normal” is (ibidem) *Neobxodimost’ v operacii byla VYzvana sostojaniem bol’NOgo* (... by the condition of the PATient), because the addition ensures that the accent on vyzvana becomes “thematic” at the moment when the cause is specified (but see 6.2 below). *Xirurg byl VYzvan* (The surgeon was SUMmoned), in contrast, does not suggests an addition (it can be there, of course, e.g., *dezurnym vraČOM* (by the doctor on DUty)), because here the subject entity’s existence in the macroscopic world is presupposed (holds true independently of the doctor’s location at a given time). But if one wants to convey nonstandard messages, language provides the possibility for doing so. In short, microscopic word order and accent effects must be kept apart from verb type/variant.

Along the same lines, with “effected” objects or object entities ceasing to exist as a consequence of the event one would expect to find in Russian *Verb OBject* order relatively more often than *Object VERB* order: *Ego
slova vyzvali uLYBku (lit. His words called-forth a-SMILE), Cvety poterejali SVEZest' (lit. The-flowers lost their-FRESHness); but I know of no statistics or discussions on this issue. Again, all word orders / accentuations are in principle possible.

5.7 From microscopic to macroscopic interpretation of negatability reduction

Often a prepositional or adverbial phrase precedes a Russian Verb NOUN arrangement with existential verb, providing a “scene” or “span” more specific than “the world” where the subject entity comes into being: 

*U nee na ščekax vystupil slabyj ruMJAnec* (lit. At her on cheeks (on her cheeks) appeared a-weak FLUSH), *Vdali sverknula MOLnija* (lit. In-the-distance flashed a-LIGHTening), etc.

As is well known (e.g., Lyons 1968: 394-395), the same construction (with the verb “to be”) is used to express an idea which in English is often translated as “to have”: *U menja togda byla maŠina* (lit. At my-place then was a CAR, i.e., I had a CAR at the time), *U nee byl SYN* (lit. At her place was a SON, i.e., she had a SON), etc., viz. “in my/her exten-sion (there) was a car/son”, i.e., conveying the existence of the car/son within the span defined by the prepositional phrase. The arrangement *Mašina byla u menJA* (lit. Car was at MY-place), in contrast, tends to be interpreted as conveying the car’s location (presupposing its existence in macroscopic time independently of its location at a specific time). This, as will be clear, is the same association as in *Podnjalsja ŠUM* vs. *Zanaves podNJALsja* discussed above. As in those examples, the arrangement must, however, be kept apart from the verb variant. Thus, *Mašina byla u menJA* can also convey that the car’s possessor is ME (rather than somebody else), and *U nee byl SYN*, for example, can also convey that she was visited by her son (who is then presupposed to exist independently of his location at a given macroscopic time). The verb “to be” also in Russian has “existential” and “locative” interpretations.

What the associations do illustrate, however, is what may be called the basic transfer of the general effect of speech-chain contraction to macroscopic time. As we saw in 2.4, the general effect is negatability reduction from left to right. In Sections Two/Three, where accent was under discussion, I gave only the microscopic implementation of this general contribution. As we saw there, the vertically negatable referent of an element in non-final position is reduced by one layer in comparison with the negatable referent of the same element in final position; this
holds true for adjectives, nouns and verbs alike (and other cases not dis-
cussed here).

The basic negatability-reducing effect of contraction, when interpreted in the macroscopic perspective, is that the existence in macroscopic time of the referents of noun phrases is presupposed (by verb meaning) from left to right. This is the motivation for the fact that, e.g., *U menja togda byla mašina* most obviously means “I had a CAR at that time”. The noun phrase whose referent is *said* to exist or to come into existence within a given “scene” or “span” rather than *presupposed* to exist, tends to be in final position and to be accented (at least in written Russian). The same holds true, in principle, for English and Dutch: *Mij overviel een gevoel van ANGST, Gisteren is de glazenwasser een ONgeluk overkomen* (see Verhagen 1986: 201 ff.). However, in Russian the principle can be applied much more consistently because word order is not “grammaticalized” for the expression of subject/object functions. Thus, when the existence of the object entity is presupposed and that of the subject entity conveyed, the most “neutral” arrangement is *Object Verb SUBject*: *P'esu otičaet origiNAL'nost'* (lit. The play (O) distinguishes origiNALity (S)), *Tolpu oxvatila PANika* (lit. The crowd (O) overtook PAnic (S)), etc.

Just as in the type *U menja togda byla mašina*, the distribution of subject/object functions in Russian then tends to differ from that in English/Dutch: in the latter languages the first noun phrase tends to be the subject (leaving aside “Topicalizations”), so that a passive, reflexive or lexically different verb (e.g., *to have*) must be used if the “left-to-right presupposed existence order” is to be combined with the requirements of “grammaticalized” word order.

Thus in contrast to accent, which works only in the microscopic perspective (except for the fuzzy edges dealt with in Section Four and at the end of section Three), and in contrast to verb meaning, which operates only in the macroscopic notion of time48, word order has more specific functions in both areas, and different ones in different languages. In 8.3 I will discuss briefly the status of Dutch/English “grammaticalized” word order in the context of my approach.

6. Figure/ground and part/whole combinations

6.1 Properties not embedding time

We saw in 3.5 that the contraction subtype exemplified by *Vysokij dom* cannot contain grammatically predicative elements in first position.
A macroscopic treatment of Vysokij dom may illustrate the difference between a time-embedding property, such as the verb in Zanaves podnjal-sja / Podnjalsja šum and properties which do not embed macroscopic time.

Just as in Zanaves podnjal-sja discussed in Section Five, the processor’s contraction operation in the microscopic Vysokij dom adds the property /high/ to the house from outside, the effect of the mental act being depth between the two momentary things concerned (microscopic figure/ground relation). When we shift to the macroscopic perspective, the two corpuscles of the microscopic perspective are merged into a single entity by viewing the property /high/ not as something added to the house from outside, but as a specification of the house’s vertical spatial extension. Again, projecting this property involves the ability to “hold” the projection of the house while “unrolling” the adjective: we can mentally expand the house vertically up to the point “high” on a scale of vertical spatial extension (as relevant for houses):

“high” ▲
“low” ▼ “house”

Again, this shift to the “extension-changing” type of mental act eliminates the idea that the house can be seen outside the category of extension. In other words, the macroscopic perspective has it that the property /high/ cannot be removed without affecting the house and that the house would have some degree of vertical spatial extension even if the property /high/ were absent: if the property were absent, the house’s upper boundary would reach to a lower point on the same scale. Again, this lower point is not the negation evoked by an accent on high, although it is easily confused with it; the “not high” evoked by accent projects the absence of the property vertically, with respect to the house, and /low/ is another property altogether; both can be added or removed from the house without affecting it.

Just as in Zanaves podnjasja, in the macroscopic referent of Vysokij dom there is an implicit identity relation between the referents of “house” and “high”. Again, this relation can, of course, be made explicit (see 1.6 and note 35 above). However, in my view it does not correspond to a mental act during processing but results from shifting to the macroscopic perspective.

Summarizing the whole chain, if we paraphrase the timeless meaning of the adjective as “something having vertical spatial extension up to a point /high/ on the scale of vertical spatial extension relevant to the thing
concerned”, the microscopic procedure, with Adjective Noun order (see 3.2-3.3), skips the “something”, directly mapping the rest onto “house”. Then the resulting microscopic combination is transformed into a macroscopic one by shifting to the “extension-changing” type of mental act; this shift eliminates the microscopic depth and changes the house from a microscopic corpuscle into a macroscopic entity which has, in any case, some degree of vertical spatial extension, the adjective specifying only the degree of that extension.

Of course, since we are accustomed to the macroscopic world, we are not normally aware that the perspective of accent deviates from “common sense” by construing extension as negatable. But this is precisely what happens if the referent of the adjective as well as the referent of the noun are seen as potential points of momentary attention.

Note that a hierarchical organization between the referents of “high” and “house” remains present in both perspectives; the vertical ordering of the microscopic perspective, which ensures that “high” presupposes “house” (corresponding to “looking ahead” - forward link - in the speech chain), is translated into the macroscopic idea that a projection of extension presupposes a projection of something having that extension; but the use of the “extension-changing” type of mental act ensures that the latter hierarchy needs nothing “in between” the referents of the two words.

So far, the example involves the same operations as Zanaves podnjalsja. However, in contrast to Zanaves podnjalsja, in Vysokij dom we must disregard the macroscopic projection time needed to arrive at a projection of the macroscopic referent: the result must be a projection of an entity with a certain spatial extension, i.e., of an entity as it is at a given moment of its life, not a projection of a part of its life (cf. The house becomes high).

Such a result can be compared to one word in the speech-chain processing phase: just as we disregarded the time between the beginning and the end of words (2.2), taking them as mental states rather than as mental transitions, we disregard the mental time needed to arrive from the microscopic configuration at a projection of a single macroscopic entity as it is at a single moment of its life; an entity is essentially a stretch of spatial extension between two boundaries, all projected simultaneously.

As a result we now have a projection of a single entity that can be subjected to an act of “following an entity through time” (and serve as a locus of attention), which act appears in grammatically predicative con-
structions and is the macroscopic parallel of accent (see Zanaves podnjalsja in Section Five). We are then, of course, in a further phase of contraction, in comparison with the speech chain, viz. beyond the point where each element of the speech chain has a referent negatable in the way required by accent. Correspondingly, in the example the property /high/ can no longer be removed by the processor (he only projects it) but only by something/somebody in the macroscopic world which/who can remove a part of the house. (Of course, in fairy-tales, for example, the house can shrink or grow on its own.) In general, the issue of who or what is responsible for changes in the world (a “semantic role” issue) becomes relevant only when it is not the processor who changes the world, viz. in the macroscopic perspective.

6.2 Adjective vs. verb

I have spelled out how the macroscopic result is arrived at in Vysokij dom in order to illustrate that the difference between my two perspectives is also relevant in attributive constructions (to be dealt with more extensively in the future). In the speech-chain-processing phase we did not go below the word level, although it is relevant in a more complete account (see note 5); correspondingly, I will omit here the macroscopic complexes below the level relevant to verb decomposition, but not without remarking that these, too, are relevant. The difference between corpuscles which do not embed time (such as attributive adjectives) and corpuscles which do embed time (such as verbs) is important for word order and linkage possibilities (see 3.2-3.5 above) and subject to historical change. If, for example, a participle becomes an adjective, it is precisely the embedded macroscopic time which disappears from the information conveyed by the word (and which is hence negatable in the microscopic phase).

For example, “geknipt” in the Dutch example Omdat hij ervoor is ge-KNIPT (Keijsper 1985: 334-335) is a verb, while in Omdat hij er geKNIPT voor is it is an adjective (omdat hij ervoor geKNIPT is has both readings). The former embeds macroscopic time, viz. in that time there is a stretch when he (or his hair) is not cut, a stretch when he is cut, plus a transition in between. In addition, somebody in the macroscopic world is responsible for the change, viz. the agent; the accent is superimposed, “not geknipt” projecting the absence of the entire “clock”:

- “not cut - being cut - cut”
- “not geknipt”
In *Omdat hij er geknipt voor is*, in contrast, “not geknipt” evoked by the accent projects the absence of a referent of “geknipt” which does not itself embed time (he is cut out for something):

↑ “cut”

↓ “not geknipt”

In other words, the verb “embeds an accent” while the adjective does not. In this case, the general contraction effect, viz. negatability reduction from left to right, is “lexicalized” into different parts of speech, a verb (more to the end of the sentence) containing more negatable information (viz. including macroscopic time) than an adjective. Given that lexicalization, the microscopic variation, which is still possible, follows the usual lines (*Omdat hij ervoor is geknipt* - verb - vs. *Omdat hij ervoor geKNIPT is*, and *Omdat hij ervoor geKNIPT is* vs. *Omdat hij er geKNIPT voor is* - adjective -).

Another example of interaction involving the verb/adjective contrast is Dutch *Jan wordt geSTOORd door VEEL teleFOONtjes* vs. *Jan wordt geSTOORd, door/van al die telefoontjes* (lit. John becomes disturbed by many phone calls / by all these phone calls). As we saw in 3.5 above, “gestoord” (nonfinite verb) cannot be linked forwards in Dutch. But in the case of the verb *gestoord*, the procedure of “processing in two steps” (see 3.4) interacts with the macroscopic procedure for “valence splitting” (for the latter see Section Seven below): one valence of the verb is developed in the second part of the sentence. If “gestoord” is an adjective, and hence does not have valences, this is impossible. As a consequence, the two sentences tend to be prosodically differentiated as indicated above, viz. with “door/van al die telefoontjes” as an afterthought (with lower accents, if any, than on the first part of the sentence) in the adjective case; the sentence then conveys the fact that Jan becomes crazy, the afterthought adding the cause of this fact. If the two sentences are pronounced in the same way, the first accent in adjectival *Jan wordt geSTOORd van al die teleFOONtjes*, spoken without prosodic boundary, tends to be interpreted differently (immediately as “thematic”) from that in the verbal *Jan wordt geSTOORd door VEEL teleFOONtjes*. In the adjective case the last accent specifies the cause of the given fact that Jan goes crazy; the verbal case also conveys the fact that Jan is being disturbed; the valence developed in the second part includes this information in the “rhematic” part.

In short, although at first sight it may seem exaggerated to distinguish between two phases of processing even for adjective/noun combinations, there are sufficient indications that precisely such a description will enable
us to explain interaction phenomena that normally remain unaccounted for in linguistic theory.

The same holds true for the preposition/verb contrast; here, lexicalization (leading to differences between, e.g., Dutch and English phrasal verbs) accompanies historical developments in verb placement possibilities (cf. Keijsper 1985: 344-356).

6.3 Entities

The Adjective/Noun example illustrates that the number of macroscopic entities is smaller than the number of microscopic corpuscles: several of the latter can be merged into a projection of a single macroscopic entity, because we have left behind the phase where each element of the speech chain must have a referent negatable in the way required by accent. In general, the projection of the complex macroscopic referent resulting from the processing process cannot be related to a speech chain uttered in time directly, but only via the microscopic world. This also holds true for entities: these are not the referents of nouns as they appear in the speech chain; they are developed out of microscopic referents during the process of verb decomposition (cf. the insensitivity of accent to the differences between John made me a hamburger/a star/a good husband).

As we saw in Podnjalsja ŠUM (Section Five), a verb can convey a projection of the fact that the referent of a noun phrase exists (or comes into being), viz. in macroscopic time; the microscopic referent concerned is then unrolled simultaneously with the verb clock. An entity in the sense of “potential locus of attention” is a referent for which such a projection is presupposed. Thus, as we saw in Section Five in Zanaves podnjalsja, the fact that the curtain exists in macroscopic time is not included in the “scope” of the verb; if the projection of the curtain’s movement were absent, i.e., if the projection of the stretch of time specified by the verb were absent, the curtain would nevertheless exist in macroscopic time. As we saw in Section Five, this push-down effect of non-existential verbs is comparable to the microscopic exclusion of a vertical layer from a word’s negatable referent. But now we are talking about the negatability of projections of facts.

A potential locus of attention corresponds, then, to a stretch of time whose projection is no longer negatable, viz., one which is excluded from the stretch of time whose projection is formed by “unrolling” in time the verb clock: no act of projecting is devoted to entities; they are “contracted” stretches of time.
An obvious association is that these potential loci of attention are the “corpuscles” of the microscopic world. The latter are, however addable to the world stack by accent (cf. ZAnaves podnjalsja discussed in Section Five), whereas potential loci of attention are the “given” entities during verb decomposition. Furthermore, the referent of the adjective in Vysokij dom and that of the verb in Zanaves podnjalsja are also microscopic corpuscles, viz. potential points of momentary attention, but as we have seen, they are not macroscopic entities. Microscopic corpuscles and macroscopic entities must not be confused.

6.4 Part/whole

Next, consider spatial part/whole combinations. In (see 4.4) Fillmore’s (1968: 23) The car broke the window with its fender, the fender need not be (and is probably not) construed as a separate potential locus of attention: it is included in the boundaries of the car, viz. as a macroscopic part of a whole. In that case, the car and the fender are “followed through time” in one go (they share a life, so to speak). Correspondingly, the verb is not decomposed into a “clock,” for the car and a “clock,” for the fender, which ensures that the subject can remain nonagentive here. If, in contrast, an instrument is construed as a separate entity, as (in our normal picture of the world) in John broke the window with a hammer, the verb must provide separate “clocks” for them; as a consequence, the subject here must be interpreted as an agent. In 7.9 below the verb-decomposition regularity involved here will be examined.

Another place where the relevance of part/whole construals for verb decomposition comes to light is in passives: as is well known, John shook his head and the like “do not have a passive”: the name passive is traditionally used for constructions in which the verb is divided into two “clocks” (see 7.9 and 8.2 below), which implies that there are two separate macroscopic entities (even if one of the two, viz. the agent, is not mentioned in the sentence).

As we have seen (2.5, 3.1, 3.3), in the microscopic perspective a part/whole combination arises if two projections apply to the same vertical layer/corpuscle (with no microscopic “depth” between them); the part is not a separate potential point of attention, but the identifying property of such a point (the whole); the whole is an unidentified point of attention without a separate correlate in the speech chain. A whole in the macroscopic perspective (as the car in The car broke the window with its fender), in contrast, is a fully identified entity; hence, a part is not the identifying
property of that whole. However, the part is included in the same spatial boundaries, so that it is not a separate potential locus of attention: it does not have a separate life but shares one with the whole.\textsuperscript{52}

6.5 Span

Just as in principle any word can be accented, any potential locus of attention can in principle be assigned a “clock” to be unrolled in time. But in the same way as words are grouped into chunks of information which can be added to the world stack by a single accent, potential loci of attention are grouped into “spans”: the verb is decomposed into as many “clocks” as there are acts of projecting temporal extension. A macroscopic entity is a potential locus of attention, but not every entity is tracked through time separately. This again saves time, in this case macroscopic projection time.

If the verb says that one entity is or will become part of the nonspatial extension (“power sphere”) of another, only one of two simultaneous stretches of time is projected. For example, the event referred to in \textit{Ivan poluchil pis'mo} or \textit{John received a letter} can be projected in two ways: either we follow John through time as he receives a letter, or we follow the letter as it moves toward John. The subject specifies the entity which is actually followed, viz., here, the nonmoving entity.

6.6 Figure/ground

Next, entities spatially ordered in a figure/ground relation also constitute a single “span”. For example, in the type represented by \textit{John is crawling with ants} there is only one “crawling” event as long as the ants are construed on top of John (macroscopic “depth”); if they are imagined beside John (two figures on the same ground) the verb must be split into two “clocks”; in that case both John and the ants crawl (John is crawling together with the ants). Note that in this case the “ground” (location) is the subject; it provides the “span” within which the ants are perceived.

As in the case of part/whole combinations, the macroscopic notion of figure/ground must not be confused with the microscopic application of the same terms: thus microscopically, \textit{Vysokij dom} corresponds to two corpuscles on top of each other; but we have seen that macroscopically the referent of this combination lacks “depth”. Both applications of the terms figure/ground are relevant to “scope”, but to the scope of different things. The microscopic application ensures that an Adjective-Noun combination, say, can be included in the scope of a single accent on the noun
(so that the two words constitute a single chunk of information, a single “accent domain”). The macroscopic application ensures that more than a single entity can be included in a single verb “clock”.

In English and Dutch transitive sentences involving a figure/ground relationship, the subject is (usually?) the figure, the object the ground, i.e., we follow the “moving” entity through time. For example, in *The general marches the fields*, the general and the fields are in the same “span”: there is only one marching activity (in contrast to *The general marches the soldiers*, where the general and the soldiers must have a separate “clock”). The “figure/ground” type is “less transitive” than the “figure/figure” type, because the ground does not have its own clock. In Russian, such examples are included among those which “do not have a passive”: *On minoval očered’* (He passed the row) etc. (Bondarko & Bulanin 1967: 159).

6.7 Back to the “presupposed existence order”

Now, in Russian, for example, we can change the word order in the figure/ground type, so that the object precedes the subject. This produces sentences such as *Ploščad’ zapolnjajut kolonny pioNErov* (lit. The-square (O) fill columns of-pioNEERS (S)); *Krepost’ ovvatili NEMcy* (lit. The-fortress (O) seized the-GERmans (S)). Here, as in *John entered the house*, the subject entity moves from elsewhere to the location specified by the object, i.e., the subject entity’s temporal extension includes a part when it is not at the location specified by the object. Note that Russian has no need to encode the location as the subject here: word order and accentuation can be freely adapted to the needs of the “psychological” content to be expressed.

This OVS order enables us to convey the idea that the subject entity is not perceived outside the “span” defined by the object: *Bassejn napolnila voDA* (lit. The-reservoir (O) filled WATer (S)), *Zemljju pokryl SNEG* (lit. The-earth (O) covered SNOW (S)), *Zal ukrasajut karTIny* (lit. The-hall (O) decorate PICTures (S)), *Ploščad’ zapolnjajut torgovye rjaDY* (lit. The-square (O) fill rows MARKet stalls (S)), etc.

Then, with “existential” verbs or verb variants, the subject entity cannot even be perceived outside the span defined by the object, as it does not exist outside that span: *Tolpu ovvatila PANika* (lit. The-crowd (O) seized PANic (S)), *P’esu otličaet origiNAL’nost’* (lit. The-play (O) distinguishes origiNALity (S)), *Sbornik ob’edinjaet obščaja iDEja* (lit. The-collection (O) unites a-common IDEA (S)), etc. In such cases OVS order is more “normal” than SVO order, as the former agrees with the “presupposed
existence order" (see Section Five). As in *U menja togda byla mašlna* (I had a CAR at the time), English and Dutch tend to encode the first noun phrase, viz. the object in Russian, as the subject, whereby the sentences concerned become passive or reflexive, or use a lexically different verb. We are then back at the type *John received a letter* (6.5).

Such language-specific encoding differences (caused by different functions of word order) are particularly liable to occur in sentences with two noun phrases but only a single act of projecting temporal extension; in that case, even if there are two pre-existing entities, these are not followed through time one after the other, so that the subject/object division does not correspond to the temporal ordering of mental acts. This point will be taken up in 8.2.

### 6.8 Three entities

The same “span” principle applies in sentences containing three noun phrases (“subject”, “direct object”, “indirect object”): the two objects are combined in a single span, so that only one of them has to be tracked through time (in addition to the subject entity). For example, in Dutch *Geef Piet maar een BOEK*, the “indirect object” Piet is the entity towards which the book moves (cf. *Peter received a book*) and the entity tracked through time. In *Geef het boek maar aan PIET*, in contrast, we follow the book (“direct object”) and the latter moves, because “aan” turns Piet into an immobile point. The latter construction is odd in cases where normally no separate entity moves: *Jan gaf een klap aan PIET* (lit. John gave a blow to Pete). In *Jan gaf Piet een KLAP* we track Piet through time, so that the issue of whether or not the object entity really moves need not be solved.

As is clear when we compare *Geef het boek maar een andere PLAATS* (lit. Give the book another place - Verhagen 1986: 206) with *Geef Piet maar een BOEK*, the construction without *aan* does not exclude the possibility that the noun phrase mentioned first corresponds to the moving entity; the direction of the movement depends on what is interpreted to be the fixed point. As “een andere plaats” most obviously refers to such a point, it is the book that moves; however, it is the book which is followed through time. In that case, the book tends to be taken to be the direct object rather than the indirect object (cf. Verhagen 1986: 202-209), just as in *Geef het boek maar aan Piet en Geef Piet maar een boek*. This illustrates that with “spans” of entities the distribution of grammatical functions easily changes.
An interesting restriction seems to obtain in the macroscopic phase which can be compared to the “two moments restriction” in microscopic time, viz. the fact that projections involving more than two moments of microscopic time give rise to a reduction in construction depth (see 2.6, 2.9, 3.4 and Keijsper 1985: 253-258). In the macroscopic phase, this translates into two “clocks” per verb, viz. two acts of projecting temporal extension. As we saw above, this is not the same as the number of entities (or noun phrases), because entities are grouped in “spans”. Following three entities through time separately, i.e., one after the other, may be too “deep” a projection to embed in a single verb, thus requiring an explicit causative. But this suggestion, which would account for the restricted semantic group of verbs occurring with two objects, must be investigated further, and in languages other than English or Dutch.

6.9 Confusion

The direction of a macroscopic movement must not be confused with the links in the speech-chain-processing phase.

Thus, both John entered the house and John received a letter have a backward link between the verb phrase and the subject noun, but the direction embedded in “entered” and “received” is different in the two cases (see also note 53). Likewise, in the case of entities not included in a single span but tracked through time separately (see 7.9), the “active” vs. “passive” direction embedded in the verb (plus auxiliary, etc.) is independent of the processor’s superimposed operations upon the speech chain.

7. Clocks

7.1 Introduction

The microscopic referent of the verb (or other grammatically predicative element) must - at least partially (see below 7.4) - be projected as a stretch of macroscopic time by considering its content in macroscopic projection time and not disregarding this mental act. Verbs never become entities, a fact reflected in linkage restrictions in the initial speech-chain-processing phase (see 3.5 above).54

When the content of a “clock” is projected in time, the projection being formed is opposed to its absence at a different noncontiguous macroscopic projection time, viz. before the act started. In this sense, a verb evokes
a "new" projection of a stretch of time: the act of projecting a clock's content changes one's projection of the macroscopic world.55

This general idea, present in all grammatically predicative sentences, when combined with the lexical meaning of verbs (plus aspect), generates a great deal of variation, which repeats "in a nutshell" the distinctions of the speech-chain-processing phase: different types of verbs repeat parts of the microscopic mechanism on the macroscopic scale; but in the microscopic phase they embed this information. In my view, disembedding it amounts to performing a few mental operations, the most important of which will be discussed in this section. (I am not yet certain about the number of different operations, but it is small.)

7.2 Macroscopic time

The time projected in the macroscopic perspective is, in contrast to that of the microscopic world, continuous: every moment of it is "in between" the preceding and the next moment, and the preceding and next moment which appear as the boundaries of a given moment are themselves in between preceding and next moments. This can be imagined by thinking of macroscopic time as a staircase:

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  ∣
  ∣
  ∣
  ∣
  ∣
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When we are projecting one part of the staircase (by holding a projection of an entity while unrolling a verb), the preceding and following parts appear as boundaries of the part currently projected, but when we continue the act of projecting as time proceeds, the next boundary is itself, a part in between boundaries (in other words, the time boundaries are imaginary).

From the point of view of accent, this "staircase" time is a series of acts of negating a negation. The acts take place before the mental eye of the observer ("horizontally"), so that he is unable to control the flow; every negation and every resulting step is itself "that which negates" the preceding moment.

If, apart from the flow of time, nothing changes, subsequent moments of our staircase time can, and usually are, represented as an uninterrupted horizontal arrow:
This “no-change” idea (every moment of which, from the microscopic point of view, is already an accent “arrow”) sometimes associates with no accent, i.e., with the corresponding “no-change” idea of the microscopic perspective. The corresponding verbs project a stretch of time, every moment of which is identical to every other (John is walking, John is sleeping, etc.). However, it is useful here to start from the staircase idea, because this enables us to discuss various solutions to the problem created by time consisting of a sequence of acts of negating and imaginary boundaries.

If we are projecting time as time goes by, the moment currently being projected is “that which negates” the preceding moment, which had that status a moment ago but is now the noncontiguous negation of the next moment, which is now the result of the current act of negating but will be “that which negates” in a moment and a noncontiguous negation a moment later. But what is “that which negates”? In the microscopic perspective, one cannot see “that which negates”, and accent arrows do not count as time; in Section Two we counted only corpuscles/layers, not what is in between. In the macroscopic perspective we can project “that which negates”, in fact, we see it as a moment of time. However, I would suggest that it has no independent status; we either see it as the continuation of the preceding moment (the next moment has not yet arrived, so we are still in the moment currently being projected), or as the transition to the next moment (we have had the preceding moment and are now on our way to the next moment).

As in continuous time it is unknown where one moment ends and another begins, this is, of course, only a mental trick whereby we chunk the continuous stream in some way. This chunking gives us a sense of direction.

If we “hold” the preceding moment until the next one arrives, we do not include in our current span the imaginary end point of the moment we are projecting (i.e., the starting point of the next moment). If we do include that imaginary boundary, we do not include the imaginary begin point of the current moment (i.e., the end point of the preceding moment): we are moving towards the future. In both cases, what ensures that we are projecting time is the fact that we do not include both imaginary boundaries simultaneously, otherwise we would be projecting a spatial referent.

Since in the former case (holding the preceding moment until the next one arrives) we are passively waiting for the future to arrive, it associates
with "static", "atelic", "movement of something not projected towards our present locus of attention", "passive". In addition, it can be compared to backward linking in the microscopic perspective, which, as we have seen (2.6, 2.9), is the absence of a "look-ahead" strategy.\textsuperscript{56} Viewing the current moment as the transition to the next moment (whose beginning is the end point of our span) associates with "dynamic", "telic", "movement of our present locus of attention" (mostly over space, as we can then see the point where we are going to), "active". Furthermore, it may be compared to microscopic forward linking: all this is "looking ahead" to some time/place at which we have not yet arrived, but which is already included in our present span.

As we saw in 6.9, the microscopic and macroscopic senses of direction must not be confused. The conceptual principle underlying them is, however, the same.

7.3 First enlargement of the clock

Since the boundaries in continuous time are imaginary, we can choose a larger stretch with imaginary boundaries instead of one moment. The boundaries can be supplied by the meaning of the verb, which can specify when a transitional stretch is completed; in that case, a staircase representation is common, for example in studies of aspect, viz.

Thus the transitional stretch in \textit{Zanaves podnjalsja} is the going up of the curtain; it ends when the curtain is up. In \textit{Zanaves podnimaetsja} (imperfective aspect) this end point is not referred to, but its existence is previewed (telic event). The stretch beginning at the end of the transitional stretch has a noncontiguous negation defined by the absence of what is the case after the transition. Thus in \textit{Zanaves podnjalsja} we know that there is also a time in the curtain's life when it is not up.

It is more difficult to imagine the combination of "holding on the past" with the idea of a change other than the mere flow of time: if we do not look forward, we cannot tell whether the stretch we are currently projecting is a transition to another stretch or will continue endlessly in
the same vein; in retrospect, however, we can see whether or not there was a change.57

Thus in Dutch *Jan heeft gelopen* we know after Jan’s walking that the time of his walking has ended (we are now in the time when he has finished walking); but while he was walking we did not know whether or when the walking would end (atelic). In *Jan is gelopen*, in contrast, the end of the time of walking is previewed during the event (included in our span, telic).58

There is an interesting interaction with accent scope here (Gussenho­ven 1983: 401; Keijser 1985: 353-354, 1987b: 194-195): in *Jan is op TAfel gesprongen* (lit. John “is” jumped on(to) the TAble) the accent on the prepositional phrase easily includes the verb in its scope, whereas in *Jan heeft op TAfel gesprongen* (lit. John “has” jumped on(to) the TAble) it tends to exclude it59, so that *Jan heeft op TAfel geSPRONGen* is the more obvious choice if the verb is to be “new” information. This interaction stems from the fact that in the macroscopic perspective Jan’s jump in *Jan is op TAfel gesprongen* is the transition between Jan’s not being on the table and Jan’s being on the table, which seems to be signalled by the accent as well (in reality, the accent replaces the absence of the entire “clock” /is op tafel gesprongen/ by its presence). In *Jan heeft op tafel gesprongen*, in contrast, we are likely to imagine Jan’s - atelic - jumping as taking place while Jan is located on the table; he jumps vertically, both his - repeated - not being on the table and his being on the table taking place in a larger stretch when he is on the table rather than elsewhere. This macroscopic time ordering (Jan is first on the table, then jumps), when misconstrued as a microscopic one, requires an accent on *gesprongen*, because in that case Jan’s being on the table is not affected by whether or not he jumps.

### 7.4 Time and space

Lexical verb meanings themselves need not urge us to project time rather than space, i.e., they need not exclude the simultaneous projection of boundaries: in *Lestnica podnimaetsja naverx* (The stairs go up), for example, we imagine the stairs as spatially extended between “not up” and “up” (i.e., reaching these boundaries simultaneously). In that case, the entire construal must be projected for some time so as to ensure that *time* is projected, viz. part or all of the time when the staircase has the property of being extended between two spatial boundaries, i.e., probably during its entire existence. The difference between this example and *Zanaves podnimaetsja* is, of course, interpretational (the choice being based
on our knowledge of the macroscopic world), but it is worth noting that verb meaning can be interpreted “spatially”.

More interesting examples are verbs which “embed a preposition”: *John enters the house, walks the fields*, etc. What such examples illustrate is the possibility to divide verb clocks over time and space simultaneously, for different referents. Thus, in *John entered the house* we follow John through time: he is not in the house and in the house at different times, his action of entering being the transition between the two. The *places “not in the house” and “in the house”*, however, coexist. Such simultaneous time/space construals enable us to include subject and object in a single span: the object, combined with part of the verb (“in”), construed spatially, defines the spatial span within which the subject entity moves (6.6). Dixon (1991: 278-286) discusses the difference between pairs like *She swam the English Channel* and *She swam across the millstream*.

### 7.5 Agentive clock expansion

We saw above that a moment/stretch of time, being “that which negates”, is grouped with the preceding or with the next moment/stretch. In both cases, the doubtful status of transitions resides in the fact that they neither are nor have a noncontiguous negation as long as they are transitions. Now a clock can be enlarged by giving such moments/stretches a noncontiguous negation, i.e., by not viewing them as transitions, but as the result of such transitions; the next moment, of course, they are again transitions. In *Zanaves podnjalsja* discussed in Section Five I gave the “being down” part of the curtains’s clock as the noncontiguous negation of the “being up” part, the curtain’s movement being the transition between the two. (In 7.3 we saw that the endpoint is included in the span (telic), and in 7.4 we saw that movement over space requires splitting the clock over time and space.)

Now consider *Ivan podnjalsja na VERX* (Ivan went upstairs). Most discussions of “semantic roles” would say that Ivan, in contrast to the curtain, is an agent. In that interpretation, we view the time of Ivan’s movement as having itself a noncontiguous negation, viz. the time when Ivan was not yet going up; the transition to the time when he was going up is then the *initiation* of the movement. This initiation is “that which negates” the time when the movement was absent, and the time containing the movement is the result of that act of negating before it becomes itself a transition.

This idea expands the clock imposed upon Ivan by the processor: it now also includes Ivan’s initiating act. The inclusion of the initiating act
implies that there is also a part of Ivan’s life when he was not going up, viz. the noncontiguous negation of the time when he did. Needless to say, the initiation does not last very long: the transition is the initial boundary of the movement stretch (the “dividing instant”); however, its inclusion in Ivan’s clock ensures that the time of movement is first the result of an act of negating and only then itself an act of negating.

7.6 Confusion

The “agentive” expansion just introduced is easily confused with the effect of an accent at the end of the sentence (on the verb in SV, on the object in SVO, etc.), but must be distinguished from it. In Ivan podnjalsja naVERX the initiating act is part of Ivan’s projected temporal extension, whereas the accent operation is the superimposed contribution of the processor. Thus it is true, as Faber (1987: 350) observes, that in The TEACHer’s LIsTening “there is a powerful sense of the teacher’s putting considerable effort into his listening, that he is listening on purpose, and that he is listening with an object”. In The TEACHer’s listening, in contrast, “one feels that the listening is effortless, that the teacher is not, in all probability, listening to anything in particular, and that he might well be unaware that he is listening at all” (ibidem).

However, this is just a non-obligatory association with the contribution of accent, and not itself the contribution of accent (see Keijser 1988: 367 ff.). Thus, in the agentively interpreted The TEACHer’s LIsTening, the last accent evokes the thought of the absence of both the initiation and the listening:

\[
\text{“initiation - listening”}
\]

\[
\text{“not listening”}
\]

In the corresponding nonagentive case the initiation is absent from the clock imposed by the processor. The association is that the accent arrow is the teacher’s initiation. But the same accentuation (last accent at the end of the sentence) associates with quite other “semantic roles”, the general point of the associations being that the clocks concerned contain a transition other than between identical parts of an event. This includes the perfective as opposed to the imperfective (see Zanaves podNJALsj in 5.3), the type Hij BLOOST ervAN as opposed to Hij BLOOST ervan (see 3.8), the type The magician amused the CROWD as opposed to The show aMUSed the crowd (see the Introduction). Oakeshott-Taylor’s (1984: 23) first explanation of (We can’t eat yet.) The poTAToes are still cooking (intransitive) vs. Mother’s still COOKing (transitive) also belongs
here: the accent on cooking in the latter sentence mimics mother’s imposition of a “clock” on the thing she is cooking (see 7.9 below, clock-splitting), or the “agentive” character of the cooking.

In none of these cases does final accent placement mean that the embedded clock contains a transition between two stretches of time: examples with similar clocks but a different accent placement can always be found, but the association undeniably exists (is psychologically “real”); the larger the clock, the more we have the tendency to place an accent in the speech-chain position where contraction is minimal, i.e., where a maximal contribution to the world stack can be made by the processor.

In examples such as The gas entered the house vs. John entered the house, or The ball rolled down the hill vs. John rolled down the hill etc., the choice between a nonagentive and an agentive subject reading is obviously interpretational (made entirely on the basis of our knowledge of the - macroscopic - world): we may include the initiating act into the projected extension of the entity concerned but need not do so. The possibility of expanding the “clock” in this way is, however, important in the processing mechanism, and not only lexically (not all verbs allow it, some exclude it): it enables us to provide different entities with clocks whose only difference is the inclusion/exclusion of the initiation. An example of the latter is John broke the window with a hammer, as opposed to The car broke the window with its fender (see 7.9 and 7.12 below).

### 7.7 Between one and two clocks

As long as the temporal extension of only one entity is projected, or as long as several entities are included in a single “span”, there is only one act of projecting temporal extension and, correspondingly, one verb “clock”. These cases correspond to a single chunk of information (but possibly more than a single word) in the speech-chain-processing phase. The macroscopic parallel to parallel linking (see 2.8), viz. the type “in between” one and two chunks of information, is found in sentences containing two separate macroscopic entities, whose existence in time is presupposed by the verb, without a part/whole or figure/ground relation between them; nevertheless, they are not followed through time one after the other (see 7.9 below for the latter, viz. the macroscopic parallel to two chunks of information) but simultaneously. These verbs refer to explicit relations between the entities or, which amounts to the same, these verbs consist of two simultaneously projectable valences.

Consider, for example, The morning star is the evening star, i.e., the use of “to be” referring to an identity relation. The two stars are presup-
posed to exist, each having its own life; the verb says that this picture of the macroscopic world is wrong: it must be replaced by a picture in which the two stars are identical, i.e., the verb corresponds to an act of projecting the identity relation, the projection of the fact that the two stars are identical being absent before the act and present after it.

Note that the example also contains *implicit* identity relations: just as the curtain in *Zanaves podnjalsja* is automatically identical to the thing which goes up if we project it while it is going up, the morning star is automatically identical to the thing which is if we project it while it is identical to the evening star. But in the latter case the verb clock itself also consists of "being", so that an explicit identity relation is projected if the thing which the first thing is, is first projected as a different macroscopic entity, simultaneously existing before the act of projecting. The syntactic relationships are, in my view, no different from those in *The morning star becomes the evening star*; however, in the latter case we do not project an identity relation present at a single moment and existing in time, but rather one coming into being, which is a regularly recurring difference between clocks (not discussed here).^61^*

Needless to say, in my view, the various uses of "to be" can be brought under a single heading on the timeless-meaning level: these various uses are possible precisely because there is, in addition to this meaning, a mechanism varying negatability.

Sentences projecting the fact that a certain relation exists between two simultaneously projected entities are "reversible" as long as one does not take into account the meaning of word order and accent. Thus *The MORning star is the EVening star* means the same as *The EVening star is the MORNning star*, except for the "psychological" content. An accent on the verb mimics the macroscopic act introducing a projection of the fact that the identity relation obtains.

The "reversibility" of sentences projecting the fact that a certain relation exists between entities (two simultaneously projected valences) ensures that different languages can choose different subject/object divisions. Thus, *Mary likes JOHN* would be translated into Russian as *Marii nravitsja IVAN* (lit. To-Mary pleases JOHN). As we saw earlier, Russian need not adapt the Subject/Object division to the needs of the "psychological" content, as word order is not grammaticalized. So *Ivan nravitsja MaRII* (lit. John pleases to-MARy) means approximately the same as (nonagentive) "John pleases MARy" or "John is liked by MARy". The type of verb ensures that *Mary LIKES John* is more obvious than other accent placements: the accent mimics the verb content introducing a projection of
the fact that a certain relation exists between two "given" macroscopic entities.

As to Subject/Object ordering in Russian, I think (no statistics are available) that Marii (Dative) nравитсja IVAN (Nominative) is more common than Ivan (Nominative) nравитsja MaRII (Dative). (Also possible, of course, and probably more common with pronouns is Ivan Marii (ej) NRAvitsja.) This preference is probably due to the fact that Ivan, although a macroscopic entity different from Mary, is "effected" in her mind (thoughts, etc.) or "affects" her mind without doing anything more than being who he is. This combines the two entities in a single "span" and groups the Russian verb with, for example, Marii prisnilsja SON (lit. To-Mary dreamt-itself a-DREAM) and other Dative-Nominative sentences.

7.8 Last step before clock-splitting

In cases like The show amused the crowd, The dark room frightened the baby etc., the subject entity also affects the object entity by its mere being in the same place/time as the object entity. The microscopic parallel to such nonagentive sentences is the last step before a shift to Thematic accent interpretation. In VesNA nastala (SPRING arrived), for example, we already have the word order (Noun Verb) and link type (backwards) ultimately leading to Thematic accent interpretation; however, the absence of an accent on the verb ensures that the noun is not combined with the negation of the predicate; as a consequence vesna is still "new", although the world state where it is introduced is no longer negatable (2.9, 3.7). In the macroscopic parallel, e.g., The dark room frightened the baby, there is already a causal relationship, but the subject entity's projected temporal extension does not yet include an initiating act, so that no time defined by the absence of the verbal property is part of its life.

In the agentive interpretation of John frightened the baby, in contrast, John's life also includes a time when he was not frightening the baby; in that case John, in addition to being in the same time/place as the baby, does something to frighten the baby, and it is this action which affects the baby.

For the same reason, nonagentive The storyteller's jokes amuse the children is incompatible, according to Beedham (1982: 102), with a resultative perfect as in The magician has amused the crowd; the latter, by referring to the subject entity's property in a time stretch after the act of amusing, turns the time of amusing into the transition between the time when the subject entity had not yet amused the crowd (the noncon-
tiguous negation of the resulting stretch) and the time when it had; this noncontiguous negation then belongs to the subject entity's temporal extension, which precludes a nonagentive interpretation.\textsuperscript{62}

It is well-known that nonagentive interpretation of *The show amused the crowd* or *The dark room frightened the baby* is associated with a last accent on the verb rather than the object. This accent placement mimics the fact that the verb does not introduce a projection of a new stretch of time with respect to a different noncontiguous one in the subject entity's life, but of something which happens given the mere simultaneous presence of the subject entity and the object entity. If this interpretation is no longer possible, the verb clock must be split, and the processor must perform two consecutive acts of projecting temporal extension.\textsuperscript{63}

7.9 Splitting clocks

The decomposition of the verb into different clocks for different entities repeats, within the world construed as existing independently of the processor, the causal relation between the processor's operations upon the speech chain and the microscopic world of accent, plus the shift from microscopic to macroscopic time by "unrolling" the result in time.\textsuperscript{64}

As we saw in 2.5, the result of the processor's mental operations upon the speech chain is imagined outside his mind, as a microscopic world stack, because the time which must be there while he acts does not exist for the result of the acts. The same procedure is used for splitting the verb clock over two entities; it introduces, during the projection of the macroscopic world, a temporary microscopic storehouse for later consideration.

Consider again *Ivan podnjalsja naVERX* (Ivan went upstairs) with the "agentive" clock (including the initiation of the movement). In the foregoing I have described the agentive expansion retaining the idea that, once we have shifted to the inside of the clock imposed by the processor, we have the same perspective: all parts of the projected extension are moments/stretches of macroscopic time. We retain this perspective as long as the projected moments/stretches follow one another, which is the case as long as only one entity (or one "span") is involved. What we now need is two simultaneous clocks for different entities. A little thought experiment shows how a single clock can be split into two causally related ones. The latter would be needed for, e.g., *Ivan podnjal sebja* (Ivan raised himself) - see below.
Instead of thinking of the agentive clock in *Ivan podnjalsja naverx* as Ivan’s projected temporal extension, let us view Ivan’s initiating act as an act eliminating the time difference between Ivan and his movement (a contraction operation): Ivan imposes a property upon himself by initiating the movement. Thinking of this operation we mentally divide Ivan into the person who performs an act of imposition (Ivan\(_1\)) and the person who gets a property imposed upon him by that act (Ivan\(_2\)). The property is then a microscopic corpuscle added to Ivan\(_2\) by Ivan\(_1\), who now causes Ivan\(_2\) to have a certain property; that property can subsequently be “unrolled” in macroscopic time by “holding” the projection of Ivan\(_2\) while projecting the property. As will be clear, the advantage of viewing things this way is that further on we can replace Ivan\(_2\) by some other entity.

Now, the important point is that the act of imposition performed by Ivan\(_1\) in this “causal” formulation cannot be observed in macroscopic time: we cannot keep our attention fixed on Ivan\(_2\), so as to see how he has a property imposed upon him (cf. *John has received a letter*), nor can we follow the movement of the property (cf. *The letter travels to John*); the property does not exist in macroscopic time (is not a macroscopic entity) and can only be unrolled in that time (turning Ivan\(_2\) into a macroscopic entity). If we want to see the “imposition” event, we must construe it as a part of Ivan\(_1\)’s projected temporal extension, viz. an initiating act which brings the *same* person to the next moment of his life, but then we remain within the macroscopic perspective.

The trick is based on a double status of Ivan’s initiating act. On the one hand, it is part of Ivan’s projected temporal extension, viz. a transition in macroscopic time. The part after the transition also belongs to Ivan’s life, viz. is a later phase in it. But on the other hand, the initiating act eliminates the time difference between Ivan and the subsequent stretch of time, i.e., it is a “contraction” operation whose result is that Ivan and the subsequent stretch of time are simultaneous. When we see the initiating act as a contraction operation, the two things contracted cannot belong to macroscopic time, because the contraction operation eliminates that time. This conflict is resolved conceptually by splitting Ivan into an Ivan\(_1\) who acts in macroscopic time and an Ivan\(_2\) who has imposed upon him a clock which can subsequently be projected in macroscopic time. We can then first project Ivan\(_1\) while he acts and then Ivan\(_2\) while unrolling the clock. But we cannot project Ivan\(_2\) while he has the clock imposed upon him, because the imposition is the elimination of the time which we would need to see the imposition.
As will be clear, the procedure of clock-splitting repeats the storage procedure of the speech-chain-processing phase: the result of the processor's mental operations in that phase is imagined outside the acting mind, because the acts find place in a time which does not exist for the result. But in the procedure of clock-splitting, the processor only projects a causal chain, whereas in the speech-chain-processing phase he has, himself, the "agent" role in such a chain.

As long as the result of a macroscopic activity follows it in macroscopic time, as in *Ivan podnjalsja naverx*, we remain within a single sort of time during the whole of an activity (staircase representation). The "causal" formulation is incorrect for *Ivan podnjalsja naverx*: it is the formulation for *Ivan podnjal sebja*, where Ivan₂ is construed as a separate entity which happens to be identical to Ivan₁. Such *sebja* sentences differ from -*sjá* sentences (see Gerritsen 1986) precisely because they require clock splitting. The latter is the procedure for projecting both an action and its simultaneous result: the processor divides the action and the result over different sorts of time (macroscopic and microscopic), so that he can project them one after the other without destroying their simultaneity. The resulting property is a new clock for a different thing, which becomes a macroscopic entity separately followed through time (i.e., in a new "span") by "unrolling" the new clock.

It follows that this other thing does not exist in macroscopic time until the clock created for it is "unrolled". Therefore, differences such as that between *John made me a star*, *John made me a hamburger* and *John made me a good husband*, do not exist for accent (see 2.4 above): separate loci of attention (in contrast to points of attention) come into being by creating clocks for them (by decomposing the verb), i.e., they result from processing (cf. note 40).

The sense of grouping macroscopic entities in "spans" (6.5) will now also be clear: clocks are split off for each span rather than for each potential locus of attention. Thus in *John entered the house*, the - macroscopic - figure/ground relationship between John and the place to which he moves ensures that the two are included in a single act of projecting temporal extension, viz. John's clock. But in *John entered the book* (in the library), the book gets its own clock, John's entering consisting in imposing this clock upon the book. Of course, the book's clock then does not contain an initiating act: the latter is John's part, viz. the act of imposition. Whereas John's initiating act in *John entered the house* is a transition in macroscopic time, his act of imposition in *John entered the book* cannot be observed in macroscopic time. But for the rest they are identical.
Likewise, in *The car broke the window with its fender*, as long as we construe the fender as a - macroscopic - part of the car, the two share a life; there are separate clocks only for these two on the one hand and the window on the other. The car, in other words, consists of a part “not fender”, a part “fender”, plus the boundary (transition) in between. In *John broke the window with a hammer*, in contrast, if John and the hammer are separate entities, a part/whole relation must be construed within the verb: John’s breaking consists in imposing a /breaking/ property upon the hammer. As we saw above, this act is the “same” as the initiating act in a single agentive clock consisting of the time when the breaking was absent, the transition and the time of breaking, i.e., a “temporal” part/whole relation with the transition/imposition as “boundary”. However, the imposition cannot be seen, i.e., we cannot see the property /breaking/ move from John to the hammer, because we have separated the lives of John and the hammer via microscopic time, so that they can be projected one after the other, although in “reality” they are simultaneous.

In the car-fender vs. John-hammer example, of course, how we construe the spatial relationship between the entities depends on our knowledge of the (macroscopic) world. But if we construe the hammer as a separate entity we must interpret the subject as an agent, because that is the only way to retain the part/whole relation. This obligatory interpretation need not be stated on the timeless-meaning level, because it follows from the processing mechanism I am proposing, just as “Theme” and “Rheme” become interpretational categories through the microscopic part of the mechanism. This does not, of course, exclude the possibility that languages encode “agentive” and “nonagentive” subjects in different ways; the former is then “ergative”. The meanings of the various forms must then be given on the timeless-meaning level, so that they can be translated into processing decisions during an actual speech act.65

7.10 Second clocks

Once the principle of clock-splitting is introduced, the content of clocks split off from the first one can be varied. Thus, in *John is reading a book*, every moment of John’s clock and every moment of the book’s clock are identical to every other within the same clock, but the book’s property at every moment, viz. /read/, is the simultaneous result of John’s reading at that moment: there is a continuous stream of clock impositions.66

For each clock, all these moments together can make up a transitional stretch leading to a resulting stretch of time (*John has read a book, Ivan pročital knigu*). Except for the fact that it is imposed inside the world
projected by the processor instead of by the processor, the imposed clock can be identical to an “intransitive” clock (Mother is cooking the potatoes vs. The potatoes are cooking). It can itself contain an initiating act, as in Ivan podnjal detej in the sense of “Ivan ordered the children to stand up”; in that case, there is no physical contact between the entities (cf. Ivan podnjal stul - Ivan lifted up the chair). An English parallel is The general marches the soldiers.

In addition, the direction of imposition can change: in a passive sentence (The book is read by John) the “causal” direction (invisible imposition) is towards the subject entity, but we first project the life of that entity. The “imposer” (agent) need not be expressed (The book is read), but the verb’s decomposition into two clocks nevertheless implies his existence (otherwise, the sentence is not “passive” in the traditional sense of the term - see 8.2 below). In this way, all “degrees of transitivity” can be described.

7.11 Superimposed time

Finally, there is the possibility of adding a further time level to a macroscopic event. For example, in The book reads easily (“middle”) the clock imposed by the processor consists of a property (called “reading”) which the book carries during its whole life. This property, in its turn, consists of an unspecified number of actual events in which the book is the thing read (by somebody else). The clock imposed by the processor is a single whole in the sense that the stretches of time during which the book is actually read, as well as the stretches during which it is not, are included in the property which the book has during its whole life. In other words, the “roles” which the book takes on can be different at different time levels.

As is well-known, such sentences cannot refer to actual events and cannot contain an agent expression: the actual events are embedded, the sentence conveying not the fact that the book is read but the fact that it has the superimposed property.

Since it is difficult to imagine that the property might be absent, it is odd to say The book READS, without an adverb specifying how it reads. Alternatively, the sentence can be given an intonation suggesting that the thought expressed in it is not yet complete and serves as a “given” for the unspoken remainder. Thus there is again interference between the speech-chain-processing phase and the macroscopic construal, in this case because the additional macroscopic time level appears to be the superimposed microscopic level.
A higher macroscopic time level must also be present in Russian -sja sentences if the latter are to be interpreted as “passives” (Gerritsen 1988). This is because the meaning of -sja says that the “active” direction must be retained; in so-called “passive” -sja this is taken care of by the higher time level, the embedded events being “passive”. In short, not every apparent “reversal” is a passive.\footnote{7}

\section*{7.12 Event unity}

In all cases, the “unity” of the event is not destroyed as long as no processor’s acts of imposition are introduced into the projected chain, and as long as the processor shifts only between macroscopic and microscopic construals; these shifts do not “count” as processor’s contributions, because they are not developments in the process of creating/projecting referents, but only enable the processor to proceed with that process. The non-introduction of the processor’s acts of imposition means that all transitions in the world construed as existing independently must be included in some entity’s temporal extension; as we saw above (agentive expansion, etc.), clocks can be enlarged for this purpose: the world must be continuously projectable.

As is well known, *John killed Bill* does not mean the same as *John caused Bill to die* (*to become not alive*): the former embeds a causal chain in a single element of the speech chain. The verb “to kill” can be decomposed roughly according to “cause to die” in a timeless sense, but during this decomposition the unity of the event must be retained in the way indicated above. A sentence trying to express the “embedded” event by means of a *speech chain*, viz. *John caused Bill to die*, never has the same meaning as a verb embedding the event, because the processor of the speech chain starts by retaining sentential coherence in the way indicated in 2.6 above; then he retains the unity between the microscopic world created from the speech chain and its macroscopic translation by applying only a micro/macro shift (which does not count as a processor’s act); and within the macroscopic world, he retains unity for the components of “caused” by using a macro/micro/macro shift (which does not count as his contribution) in the same way as he does for “killed” in *John killed Bill*.

\section*{7.13 Conclusion}

The various possibilities of verb decomposition must, of course, be studied in greater detail than I have done here, my main aim being the
explanation of a principle: once we leave behind the phase of processing the speech chain and accents, a single element of the speech chain can be “unrolled” in time, the “unrolled” picture for various verbs being systematically comparable to the various cases occurring in the phase of speech-chain processing.

There are interesting macroscopic restrictions which parallel (and interact with?) the subtle distinctions relevant at the end of the microscopic phase, i.e., at the point where we determine precisely when “Thematic” accent interpretation becomes unavoidable (see 2.10, 3.8). For example, in *Veter podnjal list’ja* (The wind “raised” the leaves) the physical contact between the wind and the leaves, the latter moving in space, ensures that the subject can have a nonagentive interpretation. If there is physical distance, as in *Ivan podnjal detej* in the sense “Ivan ordered the children to stand up”, the subject’s role must be superimposed upon the children’s initiating act, i.e. Ivan must impose this initiation as well. If, in the case of physical distance, we nevertheless want to have a nonagentive subject, an explicit causative verb must be used: *Veter zastavil detej podnjat’sja* (The wind caused the children to stand up).

But *Ivan pomyl detej*, for example, cannot mean: “Ivan ordered the children to wash themselves”; this message already requires an explicit causative. Probably, the relevant issue here is whether the resulting stretch inside a second clock would itself require a verb, an adjective or a preposition for its expression: at least the verb case probably indicates an additional act of “unrolling”. But the precise possibilities remain to be investigated.

Another issue that hopefully can be fruitfully investigated within the present framework is the meaning of passives. As I suggested in the foregoing, passives are not “reversals” of “active” sentences per se, and can only be compared to some of them (they “reverse” some but not all degrees of transitivity); see also 8.2 below. The interactions between passives, “psychological” content, and degree of word-order grammaticalization (for the latter see 8.3) deserve a more searching study than is possible within theories which simply postulate three independent types of content (“logical”, viz. semantic roles; “psychological”, viz. topic/comment; and “syntactic”, viz. Subject/Object).

Since not all verbs permit all possibilities listed in the foregoing (and those not listed here), the lexicon (timeless-meaning level) must specify the boundaries within which variation is possible for different types of verb. Thus the lexicon must, in my view, not only say that “reading”, for example, involves two entities whose existence in macroscopic time
is presupposed, but also that the first “valence”, viz. /reading/, has the second “valence”, viz. /read/, as a simultaneous result, at every moment during the event. This information remains embedded during the phase of speech-chain processing, but is translated into processing decisions during the projection of the macroscopic referent.

8. A note on subject and object

8.1 Generative Grammar

A good example of confusion between my two perspectives is the history of Generative Grammar since 1965, when Chomsky defined “Subject-of” as [NP, S] and “Direct-Object-of” as [NP, VP] (1965: 71). This definition places the notions Subject and Object in my speech-chain-processing phase: with my links added, it says that in $NP_1 V NP_2 NP_1$ functions as the Subject and $NP_2$ as the Object.

In their traditional understanding, the notions belong to my second phase of processing, where they serve to abstract from different types of “verb clock”: John is the subject in, for example, *John arrived* ("unaccusative", "ergative"), *John walks* ("agentive", "unergative"), *John is reading a book*, but not in *The book is read by John*, where the subject is the book.

Unfortunately, at first sight Chomsky’s definitions seem to be correct for English and Dutch, where word order is to a certain extent “grammaticalized” into a means for expressing Subject and Object (see 8.3 below). But other languages can use other means of expression. Russian, for example, has numerous sentences such as (see 5.7 above)

*Tolpu oxxatila PAnika* (lit. The-crowd (O) overtook (V) PANic (S)), where the “external” $NP_1$ functions as the object and the “internal” $NP_2$ as the subject, and which is not a “Topicalization”. As is well known, the Russian freedom in the ordering of, inter alia, noun phrases functioning as Subject or Object is related to the fact that Russian has cases (not to be confused with the notion Case as used in current versions of Generative Grammar).

Generative Grammar publications after Chomsky 1965 have failed to revise the Subject/Object definitions, despite their obvious incorrectness as “universal” ones. Instead, a long and as yet unresolved discussion about so-called “nonconfigurational languages” started (see, e.g., Marácz & Muysken eds. 1989), which was based on the assumption that for English
and Dutch, for example, the original definitions were correct, and which connected their incorrectness for other languages with the presumed absence in these languages of a Verb Phrase.

This idea is of little help in Russian: *Tolpu oxvatila PAnika* does have a verb phrase (the absence/presence of such a constituent in the speech-chain-processing phase depends on word order, i.e., sometimes there is one and sometimes there is not); the problem is that the verb phrase in the example unites the verb and the subject noun instead of the verb and the object noun, as should be the case according to Generative Grammar. This problem can only be solved by recognizing that the 1965 definitions were wrong. Generative Grammar went its own way.

The definitions, based on the grammaticalized expression of Subject and Object in a few languages, came to be associated with the content more generally expressed (as in Russian) by \( NP_1 \overset{V}{\to} NP_2 \) in the speech-chain-processing phase: this content came to be taken as definitional for the notions Subject and Object (implicitly, to be sure: the entire matter was so-called - meaningless - "syntax").

Since the different content expressed by, for example, *Noun VERB* and *Verb NOUN* in the speech-chain-processing phase associates with the difference between different verb clocks (see Section Five), the difference between, e.g., *John walks* and *John arrived*, a difference which was abstracted from by the traditional notion Subject, also came to be described as a difference between Subject and Object, now in "Lexical Structure". The latter idea was borrowed from Relational Grammar (Perlmutter 1978 and subsequent publications), which originally tried to solve the problems created by Chomsky's definitions rather than to contribute to the confusion.

Moreover, the difference between contents of verb clocks is today also described in terms of constituency (e.g., \([NP, S]\) vs. \([NP, VP]\)), rather than as a difference between verb referents decomposed in time (with what I call an implicit identity relation between entities and decomposed verb).

Generative Grammar has never recovered from this cumulation of misconceptions. Instead, it tries to adapt the facts of Russian, say, to the latest theory, in the following way.

The ordering strategy in sentences of the type *Tolpu oxvatila PAnika* is obviously the "presupposed existence order from left to right" (see 5.7). What is somewhat uncommon here from the English or Dutch point of view is the fact that the "presupposed existence order" is not at the same time the Subject/Object order: the subject entity comes into being
within the span defined by the object entity. The same discrepancy is shown by *impersonal* transitive sentences: *Menja klonilo ko SNU* (lit. Me (O) tended-"it" to-SLEEP), *Ivana RVAlo* (lit. Ivan (O) VOMited-"it"), etc. In these cases the object entity is affected by something else, but this other thing does not exist independently of its affecting role: the affecting thing is an "unknowable force" (Wierzbicka 1978: 128) whose existence can be deduced from its affecting role, but which cannot otherwise be seen or "followed through time"; it cannot even be named or expressed in the sentence.68 Sentences like *Lodku perevernulo volNOJ* (lit. The-boat (O) turned-"it"-over by-a-WAVE (instrumental case)) also show that the notions subject/object do not equal "first/second presupposed existence".

In Dutch and English the "Russian" principle is followed where case is expressed: *Mij overviel een gevoel van ANGST* (lit. Me overwhelmed a feeling of FRIGHT), and it is possible with Indirect Object - Subject order as well (see Verhagen 1986: 201 ff. for a more extensive discussion). But one would hardly say *De menigte (the crowd) overviel een gevoel van ANGST*, although that does not seem to be excluded altogether. At any rate, in Russian this type of sentence (which is the transitive type grouping with *U Ivana togda byla maŠina* in the sense "Ivan had a car at that time") is evidently much more common.

The type deviates from the "prototypical" transitive, non-passive sentence type; in the latter the "presupposed existence order" runs parallel to the subject/object hierarchy (Keenan (1976: 312-313) mentions this among the "universal" subject properties.)

In Russian, this prototypical relationship shows up in, inter alia, negative sentences, where subjects in intransitive sentences, and direct objects, but not subjects in transitive sentences, can be replaced by the genitive case, conveying roughly that the existence of the entity concerned is not presupposed. For example: *Ne pojavilos' stuDENtov* (There appeared no STUdents (genitive), i.e., there were none), *On ne polučal nikakix PISem* (He did not receive any LETTERs (genitive), i.e., there were no letters which he could possibly receive), but not *Tolpu ne oxvatilo PANiki* (lit. The-crowd (O) not captured PANic (in the genitive case)). As the last example shows, this also holds true for OVS sentences whose order is motivated by the "presupposed existence order": one could easily imagine an accusative object with a genitive "subject" here, but as yet I have found no examples of this, except with *ničeGo* (nothing), which is a special case. (With objects in cases other than accusative, the situation is more complicated, cf. note 68.) In other words, Russian has a so-
called “ergative” pattern here (grouping objects in transitive sentences with subjects in intransitive sentences).

Since the subjects of intransitive verbs which always presuppose the fact that the subject entity exists cannot be replaced by a genitive, the pattern leads Pesetsky (1982) to derive the genitive “subjects” in negative intransitive sentences from underlying objects, in accordance with the chain of misconceptions mentioned above.

The facts are, however, more complicated than such an analysis assumes. Thus deriving the Genitive “subject” (as opposed to the Nominative) in intransitive sentences from D-structure Objects, Pesetsky would have to derive the Accusative object (as opposed to the Genitive - in direct objects), as well as the Nominative subject (as opposed to the Genitive) in passive sentences from something other than Object. The author passes over this major problem by stating (1982: 42) that (“with a few odd exceptions”) all Accusative objects and (“as far as I can tell”) all Nominative subjects in passive sentences can be replaced by Genitive in negative sentences, which must probably be taken to mean that the use of the Accusative and the Nominative in such sentences is not worth talking about (or need not be accounted for). In reality the opposition has the same semantic value everywhere.

Pesetsky (1982: 211) correctly mentions the impersonal transitive type (Menja klonilo ko SNU, Lodku perevernulo volNOJ) as a counterexample to Burzio (1981); he has a “solution” for it: the author suggests that the absent subject can be compared to the English “it” in It rains, which was formerly defined as a non-problem by Chomsky (“quasi-argument”). This is incorrect; the Russian sentences say that the object entity is affected by an “unknowable force”, or, as Pesetsky calls it (ibidem), “natural cause”, but the English “it” is another matter; the Russian sentences cannot contain a subject, not even a “quasi-argument”.

Pesetsky also mentions that “Russian also allows impersonal passives to some degree, which take no direct object at any level”; but instead of discussing the problem which such sentences present to the theory, he states that “these constructions are not relevant to our discussion, and will be ignored” (1982: 53).

The author does not mention the type Tolpu oxvatila PAnika; this is also a counterexample, but has no “solution” in the theory.

Finally, Pesetsky, like other authors in the same tradition at the time, pretends that there are only two types of intransitive subjects (because types of verb clock are confused with the two member subject/object opposition). But, for example, Ivan (ne) prišel (lit. Ivan (not) arrived)
contains an “ergative” verb according to authors basing their discussion on the choice of auxiliary in, e.g., Italian. It is not “existential”, however, so that the subject is not Genitive in the negative Russian sentence. The same verb can be used “existentially”, viz. Otveta ne prišlo (No answer came, Genitive “subject”). Hence Pesetsky, who discusses Genitive “subjects” in Burzio’s terms (he calls them “non-agent subjects”) must say that the verb either takes a D-structure Subject or a D-structure Object (1982: 58); the former (Ivan ne prišel) is then not ergative in Burzio’s sense. Correspondingly, in Russian (in contrast to Italian), “the distinction between ergative and intransitive monadic verbs, as seen through the genitive of negation, is fuzzy, and heavily dependent on context and the speaker’s perception of the degree of agentivity involved in the action denoted by the verb” (1982: 59). In reality, there are simply more than two types of intransitive “verb clock”.

Finally, it should perhaps be repeated that the speech-chain-processing phase has in principle (leaving aside associations’) nothing to do with differences between verb clocks, because it does not decompose the verb. Thus, even in Dutch, for example, an “internal” NP can have various “semantic roles”: Er ontstaat paNieK (“existential” verb), Er loopt WaTer naar de sloot (“nonagentive telic intransitive”), Er loopt een Jongen naar de overkant (“agentive telic intransitive”), Er werkt een MAN in de tuin (“agentive atelic intransitive”), Er leest een MAN een boek (“agentive transitive”), etc.

In short, Generative Grammar is totally unable to deal with the Russian type of ordering principles and Subject/Object divisions, and is mired in endless confusion with respect to other types of language as well, because it has failed to correct the initial mistakes.

8.2 Traditional view

The type Tolpu oxvatila PAnika is, however, also a problem for traditional definitions of the content of the notions Subject and Object. This is because these definitions are based on the type of sentence in which two clocks are involved. This situation parallels that of the speech-chain-processing phase, where the traditional Theme/Rheme terminology also covers only part of the push-down mechanism summarized in Section Two (cf. note 51).

As appears from the foregoing, in the verb decomposition phase a push-down mechanism similar to that operative in the speech-chain-processing phase can be observed with regard to projections of stretches of time (see Sections Six and Seven): some verbs convey a projection of
the fact that an entity exists; then, in other verbs or variants of the same verbs, a projection of that fact is presupposed, the verb adding a projection of, e.g., a transitional stretch leading to a new state in the entity's life; next, a transition to that transition can be added ("initiation"), so that the earlier transition is first a state before it is projected as a transition; then, a second entity can come into being; the fact of this second entity's existence can be presupposed; it can have a clock imposed on it by the first entity; this clock can be enlarged in the same way as for the first entity, and so on.

In this mechanism, the point where two clocks are split off from the single verb, so that two entities can be followed through time one after the other, can be compared to the point in speech-chain processing where two chunks of information (Theme/Rheme) follow one another (see 7.8-7.9). Traditional definitions of the contents Subject and Object are based on that point, viz. the subject entity is the entity whose temporal extension is projected first, the object entity is the entity whose temporal extension is projected second. (I am leaving aside Indirect Object here.)

These definitions of Subject/Object are not very useful for cases when there is only a single act of projecting temporal extension. In Tolpu oxvatala PANika, for example, the crowd and the panic are included in what I have called a single "span" (cf. one chunk of information consisting of more than a single word in the speech-chain-processing phase): in that case we do not first follow the panic and then the crowd, but project the whole event "in one go".

What is appropriate in the traditional definition is the fact that it allows for the possibility that the processor's order of acts of projecting differs from the causal ordering in the projected verb clocks: in passive sentences we first project the temporal extension of the entity which comes last in the causal chain. I think that this idea must also be applied in the "one-span" case, in the following way.

Assuming that macroscopic processing starts as soon as possible, viz. as soon as some sentence elements have been processed microscopically, in passive sentences with the Patient in first position the verb (including auxiliaries etc.) immediately gives us the idea that we are projecting the end of a causal chain, viz. with clocks for two entities. In other words, the processor immediately knows that the projection order deviates from the projected causal order: the part preceding causally is filled in later in the sentence. It can also remain unexpressed, of course, viz. if the agent is not expressed; the verb nevertheless gives the information that there is a causally preceding part.
In the *Tolpu oxvatila PANika* type, we also start the macroscopic phase by adopting the entire “span” which can be filled in later; in the example, the case ending of *tolpu* tells us that we are dealing with an affected entity, the type of affect being a further specification.

The case can be compared to passive because in both cases the negation hierarchy in the realm of referents deviates from the “prototypical” one; if something else were absent, the subject entity, or its clock, would also be absent, i.e., the latter is not the largest, “inclusive” clock. In passives, the subject’s (Patient) *clock* would not exist if it were not created by the agent; in the *Tolpu oxvatila PANika* type, the subject entity itself does not exist outside the span defined by a non-subject part of the sentence.

Passive sentences have been relatively well-investigated, so that the traditional subject/object definitions cover them, viz. by distinguishing between the causal order in the realm of referents and the temporal order in which the causal chain is projected. The type *Tolpu oxvatila panika* remains to be investigated. In Russian, the remaining questions include the following.

What is the precise semantic difference between, e.g., *Novuju knigu avtora otlıçaet origiNAL'nost*’ (lit. The-new book of-the-author (O) distinguishes (V) origiNALity (S)), and *Novaja kniga avtora otlıçaetsja origiNAL'nost'ju* (lit. The-new book of-the-author (S) distinguishes-itself (reflexive V) by-origiNALity (instrumental case))? Note that, if case endings incidentally do not differentiate subject/object, as in *Spektakł' otlıçaet origiNAL'nost*’ (lit. The-play (O) distinguishes (V) origiNALity (S)), the non-reflexive sentence is nevertheless immediately recognized as having OVS order. This is not the case where projections of the existence of both subject entity and object entity are presupposed: *Mat' otlıçaet DOČ*’ (lit. Mother distinguishes daughter) most obviously has SVO order (e.g. *Mat' otlıçaet doč' sredi druGIIX detej - ...among OTHer children*). It can, to be sure, also be OVS, but in the absence of a context favouring such a reading, this would not be the preferred reading. In such cases, one can hardly say *?Doč' otlıçaetsja MAter'ju* (Lit. Daughter distinguishes-herself by-MOTHER); instead, a “passive” -*sja* interpretation is called for (“is distinguished by”), but that requires a superimposed time level embedding several potential occurrences of the event - see 7.11 (e.g. Daughters are always distinguished from other children by their mother).

What is the precise semantic difference between, e.g., *Bassejn napolnila voDA* (lit. The-reservoir (O) filled WATer (S)) and *Bassejn napolnilas' voDOJ* (lit. The-reservoir (S) filled-itself (reflexive V) with-WATer (instru-
mental case)? Sentences such as the latter, with a perfective reflexive verb, are traditionally mentioned among the exceptions to the rule that perfectives with -sja cannot be "passive". It would be better to recognize that "one-span" sentences are not covered by the traditional definition of passive, the latter being based on the two-clock type.

Čagina (1990: 40-43) reminds us of the fact that the active/passive rule normally taught to foreigners, viz. imperfective active sentence are "reversed" with the help of -sja, perfective active sentences with the help of a passive participle, is also wrong for cases like Glavnaju ulicu moego rodnogo goroda zapolnajut torgovye rjaDY (The main street of my native city (O) fill (V) rows MARket stalls (S)): foreign students render such sentences "passive" by writing Glavnaja ulica ... zapolnjaetsja torgovymi rjaDAmi (The main street ... fills-itself (reflexive V) with-MARKet-stalls (instrumental case), while it should be a ("stative") perfective participle. The "rule" holds true only for the type Ploscad' s pesnjami zapolnijut kolonny pioNERov (lit. The-square (O) with-songs fill (V) columns of-pioNEERS (S)), viz. there is a "passive" -sja variant to this sentence (because the pioneers' lives also include a part when they are not on the square; in such cases SVO is the so-called "normal" word order).

And so on. As soon as one goes beyond the idea that passives are means for reversing the order of noun phrases with certain semantic roles in SVO, starting instead from sentences which in their "active" form prefer OVS order (mostly, as far as I can tell, cases such as those mentioned above - a statistical investigation is indispensable here), the semantic difference between "active" and "passive"/"reflexive" is far from obvious, and the sentences concerned are not covered by the traditional definition of S and O, the latter dealing only with two-clock sentences.

In my view, the existence of this problem proves that an approach to transitivity in terms of "spans" of entities is more adequate than the traditional two-member intransitive/transitive division. The "two entities but one span" area must be investigated thoroughly before the traditional semantic definition of Subject/Object can be revised so as to include the Tolpu oxvatila PANika type.

8.3 Grammaticalization

Finally, I would like to adduce a few observations on the behaviour of accent which enable us to understand the step to the English/Dutch type of word-order grammaticalization.

As we saw in 3.7 above, in NOUN Verb the accent negates the absence
of the corpuscle involved in a no longer negatable world state, viz., normally, “the world at this moment”; in Noun VERB or NOUN VERB, the noun becomes “thematic”. In both cases, the noun is “external” to the macroscopic construal, in the sense that the verb adds a corpuscle embedding macroscopic time. As we saw in 3.5, the situation in Verb NOUN is different. Now, if the noun in Noun Verb here is to be interpreted as an affected entity, and there are no case endings or passive verb forms enabling us to keep apart the speech-chain-processing phase and the verb decomposition phase, the latter is “presumed” in the former. It is here that the notion “internal argument” in Chomsky’s (1965) sense comes into play, although in a somewhat different form than Generative Grammar would have it.

Presuming the patient function in the speech-chain-processing phase amounts to projecting macroscopic time with microscopic means: at the position in the speech chain defined by the NP concerned, an unspecified no longer negatable projection of a macroscopic situation appears, which is subsequently filled in by the verb. In other words, whereas in the normal microscopic procedure for Noun Verb the verb adds a corpuscle embedding macroscopic time, so that the noun is outside that time until we unroll the verb, in Object Verb not signalled by case endings the macroscopic time ultimately referred to is already taken to be projected at the noun; thus we “presume” the macroscopic phase in the microscopic phase.

The object entity is then “internal” in the sense that the thing concerned is not viewed outside the projected macroscopic situation. Accent interpretation reflects this construal: in Die PET moet je aan de kapstok hangen, for example (lit. That CAP must you on the hatstand hang - Gussenhoven 1987: 113), the accent does not include the rest of the sentence in its scope (but see below), as it would do if the simple microscopic

Die PET moet je ... were not overruled by the presumption of the macroscopic patient function. With two accents (e.g., Die PET moet je aan de KAPstok hangen, maar je JAS mag je AANhouden) there then almost certainly is the (“third”) type of inference described in Keijsper (1985: 293-295), viz. two combinations are taken to be true, one expressed in the sentence (pet - moet aan de kapstok), the second consisting in the combination of the negations of the two accented elements (jas - hoeft niet opgehangen).

The fact that this is more or less what happens can be seen if we make sentences like Die PET moet je aan de kapstok hangen somewhat longer, for example: Die PET van je moet je nu eindelijk eens een keertje aan
de kapstok hangen (Keijsper 1987b: 180). What this trick does is to create the circumstances in which the first noun phrase (die pet van je) can be taken at face value, without already having a macroscopic function. The accent then introduces the thing alone: further on in the sentence it appears that it was the object entity, but the object function is assigned to it in retrospect, by the part moet je nu eindelijk eens een keertje aan de kapstok hangen. The accent then includes the rest of the sentence in its scope, because at the relevant moment we have no interfering macroscopic function. In the two-accent case (Die PET van je moet je nu eindelijk eens een keertje aan de KAPstok hangen) we then, correspondingly, do not have the impression that pet is opposed to something else for which the event does not apply. In short, we then (for some time) have an “external” constituent in the speech-chain-processing phase, which is sufficient for accent interpretation to follow the same procedure as in, e.g., Die PET van je (S) moet eens naar de stomerij, or (KIJK,) PIET (S) heeft een nieuwe pet (0) gekocht.

Needless to say, this trick of postponing the assignment of the object function until accent has done its microscopic job is possible only by virtue of the fact that sentence processing proceeds in time. Even in a language where word order is “grammaticalized” to a larger extent than in Russian, we can use this fact to temporally create freedom.71

Thus Russian and Dutch/English differ in that in Russian a projection of the macroscopic situation need not appear at the first element in the speech-chain-processing phase of OVS, while in Dutch/English this is the case only with SVO (leaving aside tricks such as in the PET-example and “Russian” style sentences such as Mij overviel een gevoel van ANGST). In other words, sentences such as Tolpu oxvatila PAnika are not “Topicalizations”, i.e., do not evoke the impression that the object has been “moved” from elsewhere in the sentence (see note 70); they are, for the given elements, the most “neutral”, “normal”, “basic”, etc., order possible: the case endings ensure that the object noun can remain “external” to macroscopic time in the speech-chain-processing phase. As we saw above (8.2), this also holds true for one-span sentences where case endings incidentally do not differentiate subject/object (Spektakl’ otličaet orijinal’ nost’). Two-clock sentences with OVS/OSV order are more likely to be interpreted in the same way as Dutch/English “Topicalizations” (so that, if case endings do not disambiguate subject/object, a SVO/SOV reading is more obvious).

Whereas English/Dutch tend to take an “external” constituent in first position as the subject and to adapt the verb to that type of “grammati-
calization” (passive, reflexive), colloquial Russian tends to mark such constituents with nominative case irrespective of their macroscopic function; that style frequently uses so-called “Nominative Themes”. Often - but not necessarily - such Themes are taken up by resumptive pronouns, so that the Theme becomes a so-called “left-dislocated constituent” (type: NaTAša, ja ee ne VIdel - NaTAša, I did not SEE her).

Furthermore, the “grammaticalization” step to the “First Noun Phrase is Subject” strategy is gaining precedence, I suspect, in the case of the “near-synonymous” alternatives mentioned in 8.2 above: probably, Bassejn (S) napolnilas’ voDOJ, for example, is more frequent than Bassejn (O) napolnila voDA. A statistical investigation would be needed to elucidate this matter, while a semantic analysis of the difference between the two would reveal why the latter is nevertheless sometimes chosen.

8.4 Conclusion

It will be clear that a great deal remains to be investigated in the area of interactions between word order and transitivity. For the time being, I hope to have shown that such investigations cannot fruitfully be conducted in a theoretical framework which, as Bolinger expressed it in the very beginning of Generative Grammar (1960: 374), “head[s] off on a false premisse and end[s] with an elaborate demonstration of an untruth”.

Finally, we can return to the question raised in the Introduction: how is it possible that language users deal in time with complex projections of time? My answer would be: they are able to do so because they know how to vary, in different phases of processing, the division between mental acts and things operated upon by these acts.

The variation reflects the ability of our mind to shift between mental changes and mental states. This ability enables us to deal with a continuum in more than one way, according to our needs. This phenomenon is well-known, but not usually applied to the analysis of content.

For example, traditional linguists divide word forms up into phonemes, because these are the functional (distinctive) units linguists are interested in; by doing so, they define these phonemes as states and regard the allophones which are actually pronounced as contextually dependent realizations. Phoneticians producing synthetic speech, in contrast, often compose words out of so-called diphones, viz. segments consisting of transitions between sounds; by so doing they define these transitions as states, which eliminates the necessity to give rules for coarticulation (allophones). The sound described in both cases is the same, but the choice of approach depends on one's aim.

In the same way, if one studied word recognition, one would view the time needed to pronounce/hear a word as a transition between mental states, viz. between the mental states existing before and after the word has occurred, or between still smaller boundaries. In that case, one is interested in the mental changes which take place during the pronunciation: how soon and on the basis of what information is the speech segment recognized as a realization of a given form? In Section Two, in contrast, we divided up the speech chain into word forms and abstracted from the time needed to utter/hear these words, i.e., we assumed that every word corresponds to a mental state. We did so because we are interested in what happens with the information which is present once the word has been recognized.

In Section Two we did not disregard the mental contraction operations in between the mental states corresponding to subsequent words, because the storage procedure starting at that point is a step in the process of developing the ultimate projection. In the description of that process this step cannot be skipped, because the change of nonsimultaneous mental states into simultaneous projections affects the negatable referent of the projections concerned, which influences the interpretation of accent.
Again, if we were studying sandhi phenomena, we would prefer to look at how word boundaries are disregarded during pronunciation.

In all these cases, there is not a single “correct” division of a continuum, but rather several correct ones for different aims.

We turn now to accent. As we saw in Section Two, the translation of “not not.x” into

\[ \text{"x"} \quad \text{\(^\shortrightarrow\)} \quad \text{"not x"} \]

says that during sentence processing the implicit “.” does not correspond to a mental act during processing, because that act would change a mental state of nonsimultaneity into a mental state of simultaneity (cf. contraction operations), i.e., it would introduce an opposition between the two which is in reality absent (in contrast to the change from “not x” to “\(x\)”).

Again, if we were studying, for example, phonetic/perceptual details of various types of accent, it would be of the utmost importance to investigate the precise place in the segmental stream where a pitch movement starts or ends: variation in the alignment with different segment parts realizes oppositions between types of accent. But if one is investigating the meaning of these various types of accent (intonation), one can start from the fact that these types of accent are realized; for that meaning, the precise alignment is irrelevant. Thus, again, the important thing is to make the right choice in the right context.

The simultaneous result of the computation of the meaning of accent and of the contraction operations upon the speech chain is the microscopic world described in Part One. It consists of a vertical series of referents, each of which is a state or the “filling” of such a state (noncoincidence); the states are nonsimultaneous or simultaneous, depending on whether or not accent was involved in their creation.

When this world became the input of the macroscopic processing phase, in Part Two, we started to project the momentary states as transitions between states, viz. as macroscopic time. The acts of projecting these transitions mark a change between two other mental states, viz. the projections of the macroscopic world existing before and after the act of projecting. In that context, not translating microscopic referents into acts of projecting time but into projections of entities or their spatial extension is a meaningful option: it says that these referents do not introduce a change between different projections of the world.

Then the verb “clock” can be split up over different entities by repeating the procedure: a transition in the projected temporal extension
of an entity can be seen as an act of imposition (microscopic contraction operation); the end boundary of the transition then becomes a microscopic state (corpuscle) which can then be reinterpreted as a transition ("unrolling the clock") in the projected extension of another entity.

In my view, then, during sentence processing those aspects of meaning are translated into mental acts which are informative at that moment in the process of referent construal in that they replace one mental state by another and, by so doing, develop the ultimate projection of the macroscopic referent. As a result of that translation, relations which could, in principle, be translated into mental acts become implicit, i.e., they do not introduce an opposition between mental states which would otherwise be there. This saves a lot of time and affects negatability to the effect that the processor starts by creating a world and ends by believing that he has not done so.

It is, in my view, the ability to vary the division between mental states and mental acts which enables language users to deal in time with projections of time, and hence to compute both the meaning of accent and of grammatically predicative combinations, although these two are concerned with different, mutually contradictory, notions of time. The same ability enables language users to trick themselves into believing that the ultimate referent of the sentence exists independently of the mental operations which lead to its projection.

This does not imply, of course, that the variation between mental states and mental acts cannot or must not be abstracted from on the timeless-meaning level. But postulating the ability to introduce such variation as a part of competence (i.e., as itself invariant) has the effect that the number of units on the timeless-meaning level can be smaller than would otherwise be necessary if a precise prediction of interpretations is aimed for. Accent is only one example.

More important here is the point that the timeless-meaning notation must not imply incorrect claims about the division between mental acts and mental states during sentence processing in general, or during certain phases of it.

Thus one can describe the meaning of John is reading a book by saying, inter alia, that the verb contains two "slots" ("x read y"), and that one of them is filled by "John" and the other by "a book". In a timeless sense, this is not incorrect (albeit incomplete). But the statement that "John" and "a book" fill verb slots is a statement about the macroscopic phase; it says that the referents of "John" and "x", and the referents of "a book" and "y" must coincide in space (pertain to the same macro-
scopic entity). If one then leaves open the possibility that such identity relations are established implicitly during sentence processing (they do not correspond to mental acts), nothing need go wrong.

But one must not project the same configuration upon a speech chain uttered in time; in that case "John" "x read y" and "a book" are implicitly said to be mental states, and the identification of the macroscopic referents of "John" with "x" and of "a book" with "y" are said to be mental acts. But if there were such mental acts, somebody processing the speech chain would have mental states in which the identity relations do not obtain, and that is not part of what the sentence conveys. Instead, the mental acts upon the elements of the speech chain ensure that the corresponding projections are in the same time, i.e., they eliminate the initial nonsimultaneity. (In other words, attempts to project such timeless configurations into the speech chain pretend that this speech chain is space, which produces the wrong result.)

If, in contrast, the same configuration is seen as a projection of a macroscopic referent, it is "psychologically" inadequate in so far as it implies a division between mental states and mental acts. As we saw in the foregoing, the verb, itself, translates into mental acts in the process of projecting the macroscopic referents, and, as a result, the identity relations are implicit. Schematically ("\_" = implicit identity relation in the verb-decomposition phase):

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John is reading a book > John \_ reading

read book > book \_ read
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The timeless meaning of the verb (in the lexicon) must specify that the verb is of the type decomposable in this way (viz. two "valences", one of which is the simultaneous result of the other).

Starting from another view of sentence structure, one can represent the speech-chain-processing phase as indicated on the left in the scheme. This, as will be clear, enriches the usual constituent structure with the "look ahead" and "not look ahead" strategies of the processor. In that case, the initial division between mental states and mental acts is correct. More specifically, what is correct here is the representation of the verb. (I am not implying, of course, that there is a "verb phrase" with any possible order of the elements.)
But one must not then define the notions Subject and Object in terms of this configuration, because that would introduce macroscopic distinctions of content into the speech-chain-processing phase, which, as we saw in 8.1, leads to endless problems. Such notions of content can only be of use in the phase where the verb, itself, is decomposed. However, the expression of the contents concerned can involve the speech-chain-processing phase, viz. if word order happens to have this function in the language involved (8.3).

It will be clear that an approach along the lines sketched here leads to a reappraisal of a great number of “eternal” issues, such as the relation between “dependency” and “constituent structure”, notions such as “modifier”, “head”, “predicate”, and so on; all these notions do not reckon with the fact that language is uttered in time, let alone with the possibility that at different times during processing the status of the various components can change.

I am, of course, aware of the fact that most or even all linguistic theories do not intend to be taken literally in the sense in which I am taking them here for the sake of the argument. An unspoken assumption underlies these theories: the fact that language is used in time is too trivial a fact, or too difficult a problem, to build a theory on. To my mind, the fact is so all-pervading that it is precisely the place to start. I am convinced that a theory which does so will ultimately turn out to be extremely simple.

Amsterdam University

NOTES

1 But not only of linguistic competence (see the General conclusion to this article).
2 Some further corrections and clarifications arising from the present more comprising framework can be found in notes 13, 39, 53, 63.
3 See especially notes 8, 35, 40, 49, 54, 55, 61, 65, 67.
4 My use of the terms “horizontal”/“vertical” time conforms to the usual idea that speech time has the same direction as left-to-right writing.
5 To be sure, the differentiation between morpheme and word boundaries is less simple than I am pretending here; see, for example, Keijser (1986) on Russian ne- vs. ne. In addition, a sequence of words can be treated prosodically as a single word in such things as titles. In a more complete account, lexical accent units (words) can be compared with sentential accent “domains” resulting from speech-chain contrac-
tion; both types of time elimination give rise to a hierarchical prosodic structure. They are, however, not of the same sort; within a word consisting of two syllables \( x \) and \( y \), the minimal stress opposition is: stress on \( x \) vs. stress on \( y \); on the sentential level, the minimal accent opposition is: accent vs. no accent on a given word (or syllable), which is an opposition available for every single word (or even smaller elements, as in the case of an accent on a syllable other than the lexically determined one). When the latter type of opposition turns into the former, new complex words arise (see Keijsper 1987a: 131-137; 1987b: 196-198). Such further refinements do not affect my line of reasoning here.

As we will see in Part Two, this is not the only projection time; the decomposition of, e.g., verb meaning also requires mental time. In the present phase we are dealing with a sequence of momentary potential points of attention, in the next phase we will be keeping our attention fixed on something during a certain period of time; the former corresponds to the “accent time” discussed in the present section and in Keijsper 1985, the latter (“verbal time” or “embedded time”) is revealed by expanding in time the momentary points with which accent is concerned.

In Part Two below (prepared in Sections Three and Four) another notion of time will enter the discussion, i.e., the idea that a moment is that which is “in between” the end of the preceding and the start of the next moment; this other, seemingly complementary, concept of time is unknown in the realm of accent, as it is still embedded in the stored elements.

This is the basic difference between syntactic relations in Ebeling’s (1978) sense and mental operations in my sense. Ebeling’s relations appear as implicit relations in the next phase of processing, i.e., implicit in the sense in which the relation “is simultaneous with” (“not not.\( x \)”) is implicit in the mental operation replacing “not \( x \)” by “\( x \)”. As is clear from the discussion in the main text, my division between mental operations and things operated upon by those operations is not arbitrary: shifting from one division to another affects negatability.

The same procedure will be repeated in the next phase of processing: just as the meaning “not not” embeds projection time which is “disembedded” in the “\( x \)”s of the present section embed the notion of time mentioned in note 7; in order to bring that time to light, it must be construed as “something which is always with us”, i.e., even if it is not actually referred to; in the present phase it remains embedded in the stored elements. Thus verbs and other “grammatically” predicative elements are just “\( x \)”s in an accent diagram; the notion of time they embed is negated in “not \( x \)”. This is the basic trick of embedding time in time which enables us to deal in time with projections of time.

See 5.2 and note 39 for the crucial status of this point. If some “\( x \)” occurs in two moments of projection time, as when an element is processed in two steps (see 3.4), the two “\( x \)”s are different projections (i.e., “\( x \)” is repeated), not one lasting projection; the latter type of projection belongs to the next phase of processing.

“Afterthoughts” and “parentheses” (signalled, for example, by the size of the pitch excursion of accents) do not affect the final/nonfinal status of other elements.
But there is no one-to-one relationship between word order and processing type. For example, in Russian Noun-Adjective combinations, the adjective can also be treated as an “afterthought”; in that case the negatable referent of the noun is something with the identifying property /snow/, and the negatable referent of “white” is only the characterizing property /white/ (as in Adjective-Noun). The “afterthought” type of processing is quite frequent in colloquial Russian; the last element (here the adjective) is then usually unaccented (or has an accent with a smaller pitch excursion than the accent on the noun). See further Section Three.

It has been proposed (Verhagen 1986 and to appear; Pardoen 1991; cf. also Kompier 1992 and present Volume) that the general semantic contribution of left-right ordering is that the referent or meaning of an element x preceding an element y is perceived or conceptualized independently of y. As I now see it (Kompier 1999 was still somewhat vague on the pertinent point), two issues are involved here. First, my present formulation in terms of negatability reduction recognizes both the “independent conceptualization” and the “independent perception” cases; these terms are applicable in different phases of the negatability-reduction process. In effect, the formulation in terms of independent perception (Verhagen 1986) is, in my view, applicable only to the phase of negatability reduction where referents are no longer negatable. In the speech-chain-processing phase, this holds true only for “Thematic” sentence parts (as summarized in 2.11 below); in 2.9 below the “independent perception” idea is expressed in terms of negation for accented “Thematic” sentence parts. For other cases in the speech-chain-processing phase, the “conceptualization” formulation (Verhagen to appear; Pardoen 1991) is better; in such cases, elements of the speech chain do not yet have a referent, i.e., they have not yet been added to the “world stack”, so that these referents cannot be perceived. The “independent perception” formulation is applicable to word-order functions in the next phase of processing (Verhagen 1986: 201 ff.); this phase starts from a world construed as pre-existent, so that referents can be perceived.

However, I do not agree with the idea that independent conceptualization/perception is the general semantic contribution of left-right ordering. This is the second issue: the difference between forward and backward types of link in the speech-chain-processing phase, and the corresponding types of “participant grouping” in the next phase (see Part Two for the latter). Here I agree with Pardoen (1991: 5) that, in my terms, elements combined into a single chunk of information together with elements expressed later in the speech chain (forward link) are not conceptualized independently (see 2.7 below for the formulation in terms of negation). Correspondingly, in the next phase of processing, participants combined into a single “span” during an act of projecting temporal extension are, in my view, not perceived - “followed through time” - independently. Thus within each cycle of negatability reduction I recognize various cases, not only forward and backward link, but also parallel link and the corresponding type in the next phase; in addition, details of accent require a still more subtle classification (see Section Three).

I hope that my present formulation of the general contraction effect, i.e., negatability reduction from left to right, covers both the difference between “conceptualizing” and “perception” (different phases of negatability reduction), and the difference between various types of link or various types of participant grouping within each phase. Since the details of the general contraction effect are different for different types of construction and for different languages, more specific - timeless - meanings of word
order must, in my view, be formulated on the general basis if interpretation is to be predicted in a precise manner. I have not yet actually done so systematically. In Keijsper (1985: 313 ff.), the "negatability-reducing" effect of contraction was formulated differently, i.e., in terms of projections pertaining to the same moment or to different moments (where it is the same moment, that moment is not included in the negatable referent of the elements concerned). I have changed the formulation because the time formulation appeared to be unclear (dealing as it did with microscopic world states); it was also less general than the present one intended to cover two phases of processing. Needless to say, the issue requires further discussion.

14 Again, this will be different in the next phase, where projections of fully identified entities can be "held"; then, however, the fact that these entities exist in time (have a life, i.e. are not momentary) is presupposed (no longer negatable).

15 As will be clear, this is different in the next phase, where the processor looks at extensions in between boundaries, at the complement, as it were, of what he sees in the present phase; in reality, this "complement" is embedded in the elements of the present world stack, but the processor in the next phase seems to look at the present world "from aside" instead of "from above" (or turning it 90° with respect to the observer). This illusion is responsible for interactions between different types of content (see Part Two).

16 The corresponding coherence notion in the next phase is "event unity" between parts of a complex event (see 7.12).

17 In the next phase of processing the processor's "span" will be defined not on the speech chain, but on the decomposed realm of referents.

18 Very briefly, in Russian the intonation traditionally called IK-6 marks an intonational "theme", while IK-4 first closes an intonational sentence but then (in contrast to IK-1) takes it up as the "theme" of the next one; Odé's (1989) type Rm is indifferent in this respect (see Keijsper (1992: 173, 181, 203) for Russian and (1984: 31-33) for Dutch). Bolinger (1986; 1989) describes the relevant differences for American English in much more detail.

19 Differences between "not x" in the accent diagram and, say, the English word *not* derive from this fundamental difference.

20 As was explained in 2.5, an accent on  in its scope if "y" is interpreted according to the noncoincidence procedure; an accent on , in contrast, cannot include  in its scope, irrespective of whether projections coincide.

21 I am leaving aside clitics, which, as illustrated in Keijsper (1986) for Russian "ne", are first linked to the next element before the accent on that next element does its job, so that a clitic is not a full-fledged separate word. I think this also applies to prepositions.

22 Another possibility for the type VySOKij dom (in colloquial Russian often with other words in between the adjective and the noun), is to first map the property onto something given from the context (no longer negatable); after that the noun (often with an additional small accent, i.e. one having a lower excursion than the accent on the adjective) makes explicit which thing is meant. This is an "afterthought" procedure.
In the next phase, the same mechanism of "splitting" a projection over two chunks applies to parts of the content of words: it is the "embedded-time" procedure for splitting off valences so as to arrive at properties of different entities. See 6.2 and 7.9.

Interesting in this connection are attributively used participles, which can combine subtype 3.2 with a "verbal" idea. In Russian, such participles exhibit a number of processing possibilities and problems which do not occur in the case of attributive adjectives, such as the possibility of a certain use of parallel link.

Languages having the verb consistently in first position have yet to be investigated from the processing point of view. In Russian, sentence-initial verbs in "thematic" sentence parts are perfectly possible (although stylistically marked): RoDILsja Ivan v MoskVE (lit. Was-BORN Ivan in MOScow) selects Ivan's birth from a set of things each, for example, representing an event in his life. It therefore has an "epic" flavour; in choosing this arrangement, the speaker implies that "the whole story of Ivan’s life" is given beforehand, so that he is only recounting in time something given at a single moment.

Gussenhoven (e.g. 1987: 28-31), by not taking into account word order but only accent, mistakenly ascribes this "eventive" interpretation of NOUN verb to accent alone. In traditional Prague School treatments, the difference between (Russian) verb NOUN and NOUN verb is solely attributed to "style": the former is what Mathesius calls "objective" word order, while the latter is "subjective". See Keijsper (1985: 121-142).

This difference between attributive and predicative combinations underlies "garden path" sentences such as The horse raced past the barn fell: at first reading, "raced" seems to be a finite verb, so that it is linked backwards to "horse"; but then "fell" cannot be accommodated within the same sentence, so that "raced" must be reinterpreted as an adjunct of type 3.3, "horse" being linked forward to it.

In this particular case, ne xvataet was formerly even written as a single word: nxvataet (see, for example, Lavrov 1954: 102).

Accents negating a concurrent negation ("thematic" accents) are unproblematic even with nonconcurrent parts, because they do not introduce the problem of whether a projection of a whole remains if one piece is opposed to another one viewed beside it. It is, of course, still remarkable (see Keijsper 1985: 293-295) that things which do not exist at the same moment can be projected simultaneously; in this sense, it is more "normal" for "thematic" accents to operate with concurrent parts, i.e., complements, as in (When it stopped raining) MANY children went HOME (but the rest - simultaneously present - remained at school). But it is possible for "thematic" accents to operate with nonconcurrent parts: MANY cooks spoil the BROTH, for example, simply chooses the referent of "many cooks" from among "few cooks", "all cooks" etc. Likewise, the first accent in ONE swallow doesn't make a SUMmer is normally interpreted as opposing one swallow to other quantities of swallows (nonconcurrent parts) rather than to the rest of the swallows (concurrent parts).

We are then also freed from the problem of whether the accentuation should be IEdereen (as in IEdereen ging naar HUIS, backward link) or iederEEN (as in ieder-
EEN ging NIET naar huis - but some people did - parallel link); see Keijsper (1985: 301-302) for the latter difference.

31 The former arrangement is better - and sometimes occurs - with "er" and "het", which lexicalize (and hence put into a left-right position) the "unidentified world state/thing" projection characteristic of parallel links in the first phase of processing: NIET altijd is er een BAR aanwezig; NIET altijd gaat het alleen om GELD.

32 It will be clear why the examples of borderline cases discussed here are negative sentences: on the one hand, such sentences seem to simply reverse the accent operation (which does not occupy an additional left-right position), while on the other hand they contain a negation as an element of the left-right order, i.e., something which must be processed according to the logic of accent in the present phase but can be translated into a "span-changing" mental act in the next phase. Negative sentences are, therefore, especially suited to illustrate the borderline between information which accent treats as "embedded" and the "syntax" of accent. The clitic character of Russian ne, English contractions like don’t, won’t etc., and the peculiarities mentioned in the main text reflect the psychological reality of this conflict.

33 The interpretation of the absence of accent has fewer problems with such larger organizations: - How’s your new BOOK going? - Well, I’ve just WRITTEN a chapter. Here the interpretation is that within the given “span” (the book) there are only identical things; whether these things are parts (cf. I’ve just WRITTEN something) or separate things in the sense of accent is then irrelevant (cf. the “bit” example of 3.7 above: as long as “bit” is linked forwards in the way of subtype 3.3 and unaccented, the difference between the two readings is irrelevant to scope).

34 As far as semantically possible, only the last accent will be indicated in Part Two. If no accent is indicated, any accentuation is appropriate.

35 In Ebeling’s 1978 notation, the implicit macroscopic identity relation between the referent of “zanaves” and that of “podnjalsja” is made explicit in a syntactic relation. If this relation is read as an instruction to hold the projection of the curtain while unrolling the clock, my formulation is equivalent to the paraphrase (leaving aside tense and aspect): in Zanaves podnjalsja we project the curtain as it goes up (cf. Ebeling 1978: 325). But taking into account negatability, this paraphrase is not equivalent to the paraphrase: we project the fact that the curtain is identical to something going up (cf. Ebeling 1978: 231): the latter turns the implicit identity relation between the entity and its projected extension into an explicit identity relation between two macroscopic entities, one of which carries a time-embedding property. The latter formulation gives rise to a treatment of macroscopic time comparable to a treatment of microscopic time on the basis of “not not.x” rather than

\[ \neg \neg x \]

i.e. without disembedding that time. At the same time, however, Ebeling’s notation does disembed macroscopic time for macroscopic entities (see note 40 below). See also notes 8 and 61.

36 Even in cases where one cannot “look into” the transition, as in Ivan priexal (Ivan arrived) it is Ivan, not the processor, who is understood to act between Ivan’s not being here and his being here.
It could, for this reason, be left out of the clock. I have put it in here so as to point out the difference with the "not x" of accent. In Section Seven we will see that negations play an important role in the sense of "direction" we have in macroscopic time and in the procedure for "enlarging" the clock, if this is required for the retention of event unity.

This is essentially why the logic of accent breaks down in the macroscopic world (and why the latter does not exist in the world of accent). In the case of entities, for example, the wider macroscopic span can handle the idea that the presence of an entity in one place concurs with its absence elsewhere at the same moment. This idea is impossible if, as in the microscopic perspective, we are statically looking at one place; in that case, a thing occupying that place can only be absent and present (i.e., in that place) at different moments; in other words, if the microscopic "not x" and "x" apply to the same world state, only one of them can be correct, unless there is a meaning saying that they can both be correct, as the meaning of English Auxiliar-Subject order does (see 3.6). For the same reason, accent cannot see movement (in time, over space); the latter idea presupposes the broad span of the macroscopic perspective.

When writing Keijsper 1985 I was not yet aware of this crucial difference between the microscopic and the macroscopic construal - it appeared only in Keijsper (1988: 384-385, note 4), but still incorrectly, viz. formulated in microscopic time. Therefore, in Keijsper 1985 I sometimes used formulations such as: "in Ivan naverXU (John is upstairs) we first picture Ivan when he is not up, then when he is up". This should be: "we first picture Ivan, then his being up", i.e., the projection of Ivan is not "held" during the accent operation, so that we have two separate corpuscles in different moments rather than a lasting projection of Ivan in two different phases of his life. In contrast to some of the formulations, the diagrams used in Keijsper 1985 are correct, viz. for the example:

```
| "naverXU" | ----- 2
| Ivan "not naverXU" | ----- 1
```

Here, "Ivan" occurring in moment 1 is not repeated in moment 2 (let alone held in between), which is how (microscopic) things should be: a projection "x" repeated in the next moment of microscopic projection time (see 3.4 above and Keijsper 1985: 226-227) is always a projection of a different x. Only projections of unidentified things without a separate correlate in the speech chain can be held within the logic of accent. The latter could be indicated in the diagrams as follows (repeating projection "p" in another moment of projection time and holding it in between):

```
| "p" |
```

See also the discussion of borderline cases at the end of Section Three (3.8).

Starting from the speaker, the relevant point is that the process of "rolling up" the macroscopic world into corpuscles relatable to elements of the speech chain must result in a representation in which the information concerning the number of macroscopic entities is embedded in the verb; otherwise, the speaker does not abstract from macroscopic time and would be unable to deal in time, viz. in a speech chain, with that time. Linguistic theories which do not abstract from macroscopic time in the way
indicated here cannot, in my view, account for the regularities of accent and word order, let alone for the interactions between different types of content.

41 The closest Dutch parallel does not involve verb position with respect to noun phrases, because that order has acquired another meaning than in Russian, but rather the position of adverbial phrases - including "er" - and such elements as "zich" with respect to the noun phrases concerned. However, the interpretation then is that of 5.7. In English the "Russian" type of opposition can be found in phrasal verbs: *He took out the eggs* (cf. Russian VS, VO) vs. *He took the eggs out* (cf. Russian SV, OV).

42 To be sure, a real outsider's idea of a superimposed creator takes a larger perspective on things than the macroscopic one, rather than a smaller one (cf. an investigator observing both the creative acts of the processor and what happens in the world created by the processor); the creator himself, however, looking at his creation while he is creating it, without abstracting from the fact that it is created (by acts invisible to him), construes the world he is creating in the microscopic time concept, so that, e.g., the property /exist in time/ can be added to the creation in a single moment. Needless to say, the notion "macroscopic world" as used here includes heaven and (other) hypothetical worlds such as those referred to in fairy tales, i.e., that what is construed as existing independently of our mental operations. The philosophical issue of whether the macroscopic world does indeed exist independently is totally irrelevant here and will not be discussed.

43 In the terminology of Generative Grammar (see 8.1), the presupposed character of the fact that Mother exists and/or the "agentive" character of the verb ensures that the subject is an "external" argument in "D-structure"/"Lexical Structure", while the Verb NOUN arrangement ensures that the noun is an "internal" constituent in the speech-chain-processing phase. The two are perfectly compatible.

44 Thus the use of the arrangement is much broader than the so-called "ergative" ("unaccusative") verbs which current versions of Generative Grammar would like to see here.

45 Note that the interpretation of the instrumental case as "cause" or "agent" runs parallel to the interpretation of the subject in terms of presupposed existence. This follows from the "push-down mechanism" sketched in the following chapters. Further, note that the sentence *Neobxodimost' v operacii byla VYzvana* is a "passive" type of sentence (at least in form) which is normally accompanied by an instrumental object; the existence of such sentences is not accounted for by theories which explain the occurrence of passives by the wish to omit that object (cf. 8.2).

46 As is well known, in English, where the placement of the particle in phrasal verbs is semantically comparable to verb placement in Russian (see note 41), the particle normally precedes the object if the latter is "effected", as might be expected (see, e.g., Bolinger 1971: 61 ff.). Theories which regard the placement of such particles in English as a "stylistic" matter but talk about SVO/SOV etc., in, for example, Russian in quite other, viz. "typological", terms fall wide of the mark.

47 By taking preterite examples, I avoid having to discuss the presence/absence of the word *est* in the present tense.
In contrast to Russian aspect, whose various uses I would probably analyze using both microscopic and macroscopic types of negation, viz. in so-called quantitative and qualitative aspect - cf. 4.2 (iterative use).

Thus arguing the other way round (speaker instead of hearer), what I am saying is that somebody wishing to convey a projection of a high house must mentally separate the property and the house by "lifting" the former "up" (making it negatable vertically), so that it is in another vertical layer than the house and hence no longer the same microscopic thing; in the corresponding speech fragment, the "depth" translates into temporal order. In contrast, working towards Noun-Adjective order, in, e.g., Russian (see 3.3), the speaker mentally separates the identifying property /house/ from the remainder. In both cases, the separation introduces the microscopic perspective.

Since we are concerned mainly with temporal extension, the example was one involving spatial extension. The same idea is, of course, intended to be applied elsewhere as well. For example, the property /white/ in white snow is, where accent is concerned, a separate potential point of momentary attention and hence something added to snow from outside. The macroscopic construal sees /white/ not as a separate point but as something lacking its own boundaries and outside the processor's power: it ensures that snow has a certain colour, and the property cannot be removed without affecting its carrier, i.e., it is not added to that carrier from outside; correspondingly, there is nothing "in between" the property and its carrier (implicit identity relation).

I avoid the term "valence" here (and use, instead, "clock"), because the spatial grouping which requires only a single act of projecting temporal extension is not usually recognized in analyses in terms of valences. Correspondingly, I am not talking about a two-member opposition between "intransitive" and "transitive", but rather about "degrees of transitivity" (term borrowed from Hopper & Thompson 1980): it is the latter that correspond to the various types of speech-chain chunking in Section Two above; these types are also a more detailed classification than the traditional distinction between sentences which are entirely Rhematic and sentences which contain both a Theme and a Rheme.

The transitional case, between microscopic and macroscopic part/whole, is the "it" in It's JOHN: a separate element of the speech chain referring to an entity whose identity is filled in by another element of the speech chain. This "it" cannot be accent-ed (except for correcting a mistake made by a nonnative speaker, for example); its referent is not negatable in the way required by accent. In this sense this "it" groups with unexpressed microscopic wholes. But the fact that it is a word, i.e., an element of the speech chain, introduces meaningful word-order oppositions which could not exist if the element were not expressed. A comparable "empty" element is the existential unstressed there (Dutch er). Keijser (1988: 378-379) discusses the relation between intonational afterthoughts (which - see note 11 - do not affect the final/nonfinal status of other accents) and macroscopic part/whole construals.

It follows that the terms figure/ground and part/whole are of little help in distinguishing my two perspectives, as they are themselves part of the differences and correspondences between the two perspectives. Therefore, I now regret having used these terms in Keijser 1985; in that work they are, however, consistently used in their microscopic sense. The confusion which arises from not distinguishing two perspectives is nicely, if unintentionally, illustrated by Talmy (1975, 1976). In the
microscopic sense, it is correct to say that the “Theme” part of a sentence is the ground and the “Rheme” part the figure (Bolinger 1986: 46; Keijsper 1985: 149 ff.). Thus, in *The PEN fell off the TABLE* the pen gets assigned to it - on top of it - the property of falling from the table; thus from the processor's point of view it is the “ground”. Talmy (1976: 58) alludes to this sense of figure/ground when he says that what is “presupposed” is the ground and what is “asserted” is the figure. In the macroscopic perspective, in contrast, the pen is a “figure”, viz. “the moving or conceptually movable point whose path or site is conceived as a variable the particular value of which is the salient issue. The ground object is a reference point, having a stationary setting within a reference frame, with respect to which the figure’s path or site receives characterization” (Talmy 1976: 57). The two are compatible because in the Theme/Rheme sense, the verb is included in the “figure”, viz. the property of falling off the table; the “movement” of the figure to the ground finds place in the processor's mind (linkage). In the macroscopic perspective, the meaning of the verb, now specifying the pen's projected temporal extension, ensures that the pen is the figure and the table the ground. In the latter sense, *John in JOHN received a LETTER* is not a figure. Talmy (1975: 68) confuses the two senses when he regards the Theme as a figure and the Rheme as a ground, because in most of his examples the Theme (“presupposed”) happens to be something moved or movable macroscopically with respect to the thing corresponding to the Rheme. The term Theme as used in part of the literature on semantic roles (e.g. Gruber 1976), viz. as the “movable thing” is, of course, not a clarifying innovation either: the Prague school Theme/Rheme terminology is much older, and should be respected when new terms are coined. In short, it is true, as Wallace (1982: 218) observes, that “with certain exceptions, the figure-ground principle appears to underlie many of the “hierarchies” which have been proposed to explain the nature of linguistic categories in grammar and discourse: e.g. Comrie’s “animacy hierarchy”, Givon’s “topicality hierarchy”, Hopper and Thompson’s “transitivity hierarchy”, Silverstein’s “agency hierarchy” and Timberlake’s “individuation hierarchy”. The ranking of human over nonhuman, count over mass, animate over inanimate, perfective over imperfective, and so on which these hierarchies include follows quite well from the criteria which perceptual psychologists have claimed to be important in separating visual figure from ground.” But Wallace’s suggestion (1982: 201) that “the distinction made in perceptual psychology between figure and ground provides an interesting and useful parallel which may help to elucidate the meanings of linguistic categories and their interrelationships” only translates the problem into other terms which are themselves part of the original problem. In my view, all this terminological confusion is a consequence of the fact that we operate with two definitions of time and negation which are not usually distinguished by linguists (in contrast to logicians dealing with time); hence I prefer to use the time/negation terminology, despite the fact that by so doing I take on the responsibility of clarifying, at some time in the future, how natural language differs from what logicians feel is important when they distinguish between discrete and continuous time. For the time being, I hope that my informal discussion conveys my intention reasonably clearly.

54 Therefore, in my view, an analysis of *Ivan guljaet* (John walks), for example, based on “Ivan is identical to somebody walking” is incorrect, even if we abstract from the difference between implicit and explicit relations (see notes 8 and 35): it
suggests that the element "somebody", at least in some arrangement (probably in final position) could belong to the negatable referent of the verb; in that case, the noun phrase (later subjects and objects) could be linked forward to the verb (type 3.3, with the verb in final position). The behaviour of accent shows that this is not the case. It is possible that the situation is different in languages with verbs containing affixal subject/object markers. The point requires investigation.

Note that an accent arrow must replace a projection of the absence of something by a projection of that thing, so as to ensure that it introduces time rather than depth - see 2.11); in the macroscopic case, devoting mental time to projecting the contents of a potential clock is in itself sufficient to separate stretches of time from stretches of space: in the latter case, there is no act of projecting; hence the opposition between absence and presence of the projection is sufficient. Although verbs can be compared to accent ("grammatical" vs. "psychological" predicativity) the two must not be confused. Rhematic accent (assertive type) introduces referents into the microscopic world stack, whereas grammatical predicativity changes only one's projection of the macroscopic world: we are then in another cycle of negatability reduction. Ebeling (1981) discusses accent/word order in terms of development of projections of the world, viz. as in my macroscopic cycle; this is a consequence of the fact that the model abstracts from the speech-chain-processing phase. What I discuss in terms of the development of projections of the world, viz. the macroscopic phase of processing, is abstracted from in Ebeling's model, because macroscopic time is not disembedded (see note 35; cf. note 61 below).

The noncoincidence procedure of 2.5 also belongs here: we choose something unidentified as a fixed point and mentally "move" something else to that fixed point, identifying it by so doing. The "movement" is, of course, virtual, even on the scale of the microscopic perspective, the choice of a fixed point creating the impression. The macroscopic parallel to this operation is the "virtual movement of something not projected towards our present locus of attention" (e.g., John received a heavy blow).

This remark serves only to skip aspect problems. For example, Ivan polučil stipendiju (Ivan received his grant, perfective aspect) has no corresponding Ivan poluiaet stipendiju (imperfective) in the sense "Ivan is in the process of passively waiting for his grant to arrive"; rather, the event becomes "prospective": Ivan is in the process of doing things so as to receive his grant (e.g., at the post office). Likewise, imperfectives derived from so-called Aktionsart perfectives (e.g. On naezdil 100 kilometrov - He travelled, so that in retrospect we can say that he went through 100 kilometres), if they are possible at all, usually have only an iterative (or "presens historicum") interpretation, because during the event the action is atelic; the fact that it has reached a boundary can be established only in retrospect.

In GG treatments, Jan heeft gelopen is often called "agentive" (or "unergative") and Jan is gelopen "ergative" (or "unaccusative"). However, the so-called "ergative" type (which is, of course, not ergative in the traditional sense) includes both "agentive" and "nonagentive" cases - see 7.5 and 8.1 below.

Gussenhoven's rules for accent placement exclude this possibility altogether, which is, in my view, incorrect.
The combination of perfective aspect with a verb interpreted "spatially" introduces the impression of a moving observer (Barentsen 1985: 111, 182-183), i.e., the perfective aspect still requires a "temporal construal". This difference between imperfective and perfective aspect is relevant to the interaction between my two perspectives, but this question will not be discussed here.

This use of "to be" in Ebeling's (1978) notation is written as a nexus relation, and is used for making what I call implicit relations explicit in all subject/verb combinations. Thus, it also appears in the notation of The morning star becomes the evening star, which then reads (partially paraphrased) "the morning star is identical to the thing which becomes identical to the evening star". But The morning star is the evening star is not written as "the morning star is identical to the thing which is identical to the evening star", although this is, of course, true and, as in the case of "becomes", makes an implicit relation explicit. In this way, Ebeling's notation gives all verbs except "to be" (whose use referring to an explicit identity relation is taken to be the invariant meaning) as "relata", so that macroscopic time is not disembedded (see note 35). The "translatability" of relata and relations enables one to analyse all sentences with the help of a closed set of invariant syntactic relations (aspects of meaning not covered by these relations can be written as "relata"). But in my view, it also ensures that a notation which does so is inadequate as a model of a speech act taking place in time (see 1.6): in such circumstances it is essential that language users are able to save time by varying the division between "mental acts" and "things operated upon by these acts"; the former correspond to changes in the processor's mind. As we saw in 2.3 ff. the use of this ability introduces negatability variation. In terms of negatability, the notations paraphrased above are not identical.

The same phenomenon is probably involved in languages using ergative in aorist/perfect/perfective sentences but not in other tenses/aspects. Needless to say, the term "ergative" as currently used in Transformational Grammar has nothing to do with this.

In Keijzer 1988 I discussed the difference between nonagentive and agentive hierarchies and pointed out (1988: 381) that it does not belong to the realm of accent and word order in its psychological use, because the verb "valences" are expressed by a single word. But I failed to take the next step when I represented the hierarchies by means of the temporal ordering of speech-chain links between the "valences" and subject/object (1988: 380). This is wrong, as I now understand, because what is temporally ordered in the macroscopic phase is not the processor's operations upon "valences"; this would turn the "valences" into properties added to entities from outside, viz. by the processor, and would make the processor the creator of the causal chain, whereas in reality he is only projecting it (so he thinks). What is temporally ordered in the "agentive hierarchy" is the processor's acts of projecting the "clocks" developed out of the content of a single verb, but each of these subsequently considered "clocks" entertains an implicit identity relation with an entity. The difference is the slight but essential borderline between "psychological" and "logical"/"grammatical" types of content.

In a more detailed discussion than is possible here, these two things would have to be kept apart. Thus in John watches television the television's "clock" stops existing as soon as John stops watching (i.e., stops imposing the property /watched/ upon the
television). In such cases, viz. where every moment of the object entity’s life is identi­cal to every other one, without these moments together being a transition to a resulting stretch, there is little sense in “unrolling” the object entity’s clock separately, the fact that it is being imposed for some time being sufficient for an understanding of its contents. Such sentences are odd in “passive” form, viz. *The television is being watched*, because the latter construction (following the television through time) im­plies that the imposition acts affect the television in a way which can be viewed inde­pendently of the fact that there are such acts. I will leave out such further refinements here.

Thus, as I implicitly argued in Keijsper (1988: 372-377), Ebeling’s (1980, 1983) discussion of corresponding Russian examples, which discussion leads to the postula­tion of two semantic alternants for the instrumental case used in “passive” -sja (“actor”) and elsewhere (“instrument”, i.e. “explicitly not actor”) misses an important generalization. In Ebeling’s notation this is unavoidable, because it does not recognize part/whole relationships between entities as a separate type, and does not take into account verb meaning apart from the number of entity “slots” it contains (plus, in this case, the point mentioned in note 67 below). In this sense, postulating my proces­sing mechanism as a part of competence (see Section One above) reduces the number of timeless meanings. The same holds true for the various uses of -sja.

Note that we use the same word *read* for simultaneous and nonsimultaneous results (*John has read*). This alone shows the similarity between subsequent stretches of time in a single life (traditionally a matter of tense/aspect) and simultaneous stretches of time in different lives (traditionally a matter of valence).

In Ebeling’s (1978) terminology this says that the Narrated Period (higher time level) has another content than the Event Period, and that it is the former which is directly referred to here. In my view, it is incorrect in such cases to not separately specify the contents of the two time levels: in that case, the fact that “middles” and “passive -sja” cannot refer to actual events (so that perfective “passive” -sja is practi­cally excluded) would remain an arbitrary property of the sentences concerned, whereas in reality it is an obvious concomitant of different contents on the two levels.

If the object is accusative, the affecting force or subject entity is felt to come from outside the affected entity; if it is dative, the event takes place within the affect­ed entity. Most impersonal sentences have a dative object, obviously because the “from outside” idea is more difficult to combine with the idea that the affected entity and the affecting force constitute a single “span”. This sense of “external”/“internal” has been omitted here, so as not add to the confusion, but it is obviously relevant to the issues discussed.

As we saw in 5.5 ff., in Russian both “existential” verbs and “telic movement” verbs are congruous with Verb NOUN order. But the “telic movement” type is just as congruous with Noun VERB as with Verb NOUN. And, for that matter, *Rabotaet IVAN* (Lit. Works Ivan) is perfectly possible, too, although when a context is lacking this is not the most obvious choice at first sight; the “most obvious choice at first sight” seems to be the only type of occurrence GG linguists are willing to consider, thus restricting the data to those which fit the latest theory. Also if a Russian “sub­ject” is in the Genitive in a negative sentence, any order is possible (the word in-
volved, can, for example, have a "Thematic" accent), although there still is a tendency - in written Russian - to obey the "presupposed existence order", i.e. also when case endings alone ensure correct understanding of the existence hierarchy. In short, word order, type of verb, and the meaning of cases must be kept apart.

One then has the impression that the noun phrase has been "moved" from its normal place (hence the Topicalization transformation in Generative Grammar). This impression is the same as in, e.g., I do NOT think he is RIGHT, where the parallel link ensures that the negation "applies to" the dependent clause (see 3.6 above). It is the projection "no longer negatable world state" or, in the Object case, "no longer negatable macroscopic situation" which is responsible for this impression; as negatability is reduced from left to right, one is inclined to think that the no longer negatable thing would be negatable if the element of the speech chain where the projection comes into play were expressed further to the right.

The same addition to the speech-chain-processing phase must be made for Prepositional Phrases in first position; the "external" vs. "internal" construal (the latter involving a projection of the situation filled in by the rest of the sentence) is decisive for coreference possibilities.

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