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Main structure and side structure in discourse

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Abstract

Characteristic for research on the distinction between main structure and side structure in discourse, a distinction that is central to narrative studies, is the absence of uniformity on the notional level. Studies into this distinction have in common that they fail to provide sufficiently adequate criteria to distinguish side structures from substructures, thereby arriving at a rather problematic distinction between main structure and side structure. The aim of this study is twofold: (i) to propose an adequate, formal definition that provides a general identification criterion for distinguishing main structure from side structure in different types of discourse and (ii) to account for the broader concept of main structure that is implied by this definition. This is done by providing an additional criterion for distinguishing between different types of substructures belonging to this part of the discourse: substructures that ultimately define this part and substructures that, while they are relevant to this leading part, form attached elaborations that other authors have considered to be part of the background. Central to this analysis is the basic structuring function of explicit and implicit topic-forming questions in discourse.

1. Introduction

It is generally acknowledged in discourse-oriented studies in linguistics, (formal) semantics, and artificial intelligence that because of differences in prominence of its parts the structure of a well-formed discourse is not always homogeneous. A distinction is made between discourse units constituting the MAIN, LEADING PART of the discourse and those constituting intervening, but related, SIDE PARTS. This distinction between main structure and side structures is frequently identified with the classical distinction between foreground and background, which, until recently, was mainly studied in the context of narrative discourse. The foreground is
expressed by the events forming the story line, that is, those whose order of presentation matches their temporal order, while the background material consists of attached elaborations that lack this characteristic temporal property. Although many attempts to characterize the distinction have resulted in relevant insights, there is still no adequate, generally accepted, formal definition that provides an identification criterion for this distinction in both complex narratives and other text types.

In addition to the fact that some of the given criteria for distinguishing between main structure and side structure are meant to operate only in narrative discourse and as such cannot be generalized to other text types, the criteria vary according to which discourse contributions belong to either the foreground or the background. They differ in particular with respect to the structural status of material that in some (to be specified) sense is "relevant" but does not itself constitute the leading part of the discourse. In narratives, this material usually has a supportive function with respect to material constituting the story line. However, no arguments are provided as to why this material should be part of the foreground or part of the background. No criteria exist for distinguishing between the leading contributions and this secondary but relevant, attached material, as well as between this material and the attached nonrelevant material. In this paper we will propose a formal definition of the main structure–side structure distinction, the main purpose of which is to provide an adequate solution to these problems. The proposal is not restricted to narrative discourse, though it also aims to provide more clarity and refinement in the structure of this discourse type.

As far as narratives are concerned, different terms and term pairs have been introduced to refer to the main part of the discourse or the distinction as a whole, for example, the terms *narrative skeleton* and *narrative backbone* (e.g. Labov 1972, 1981), and the term pairs *foreground–background* (e.g. Hopper 1979; Reinhart 1984), *main line story event clauses–durative descriptive clauses* (Polanyi 1989), and *main structure–side structures* (e.g. Klein and Von Stutterheim 1987; Von Stutterheim and Klein 1989), though the application of the latter term pair is not restricted to the structure of narrative discourse. However, apart from these terminological differences, the literature provides some essentially different identification criteria to distinguish a side structure from the main part of the discourse.

Most authors state criteria in terms of a *taxonomy of linguistic markers* (Hopper 1979; Labov 1981; Reinhart 1984; and others). An utterance is said to belong to the main structure of a narrative if it has, for example, a specific tense, word order, and/or morphological marker. In addition to these taxonomies, many of them also provide an underlying criterion with the purpose of giving a formal definition of the distinction. In
narrative studies this criterion is mostly given in terms of *temporal order*. However, as is generally acknowledged, the main structure–side structure distinction is not necessarily restricted to narrative discourse and therefore requires a general identification criterion. In addition, due to the fact that others have considered relevant background material to belong to the main structure of the discourse, this criterion, which implies a relatively gross distinction between the foreground and the remaining part of the discourse, also needs refinement.

Reinhart (1984) also provides a criterion in terms of *gestalt perception* that in principle is not restricted to the identification of the main structure–side structure distinction in narrative discourse. The distinction between main structure (“foreground”) and side structure (“background”) is considered to be the linguistic counterpart of the figure–ground distinction in gestalt theory. However, neither this criterion nor the criterion in terms of temporal order accounts for the structural status of relevant material that others consider to be part of the foreground rather than the background.

On the other hand, Grosz and Sidner’s (1985, 1986) theory of discourse structure, while not making an explicit distinction between foreground and background, does implicitly provide a general criterion that implies a broader concept of the main structure of a discourse. The criterion is given in terms of *discourse intentionality*, implying that the background contains only material that does not contribute, directly or indirectly, to the leading part of the discourse. In this framework an intervening side structure would be analyzed as a digression, namely “a segment that is linked to the segment it interrupts by some entity that is salient in both, but that has a DSP [discourse segment purpose] unrelated to the DP [discourse purpose] to which the interrupted segment’s DSP contributes” (1985: 838). However, no general criterion in terms of D(S)Ps is given to distinguish between material in the foreground that directly contributes to the overall discourse purpose, that is, the material that constitutes (a part of) the goal-satisfying part of the foreground, and material that is merely subservient to this part, which may include clarification and correction subdialogues. The criterion in terms of discourse intentionality is also insufficient, due to this.

Among the given criteria are also those in terms of *questions*, consisting of both *local* and *global* criteria. In addition to other criteria, Labov (1972, 1981) presents the following local criterion for the identification of the main structure of narrative discourse: the narrative clauses belonging to it must be an appropriate answer to the critical question *And then what happened?* Naturally, this criterion is subject to the same criticism as the above criteria in terms of temporal order and gestalt perception.
An additional global criterion is given in Klein and Von Stutterheim (1987); Von Stutterheim and Klein (1989). In contrast to earlier proposals, the authors explicitly address the important point of the general character of the foreground–background distinction, which until then was mainly studied in narrative discourse. The criterion they give implies that a so-called quaestio underlies every text. This explicit or implicit question is answered by the set of sentences composing the main structure of the text. With regard to narrative discourse, the quaestio is a specific question responsible for the characteristic temporal organization to be revealed, such as the (abstract) question: *What happened to you at* $t_1, \ldots, t_n$? It can be broken into a set of partial questions that function as the local questions to be answered by the individual sentences that constitute the story line. Thus, this criterion involves a narrow concept of main structure, implying the counterintuitive result that a side structure may contain material that, while it is important to the main structure, does not contribute to an answer to the leading question that defines this part of the discourse. This, together with what we have stated earlier, means that arguments must be given why this material should belong to the background. These arguments must include a criterion adequate for distinguishing it from the irrelevant material in this part of the discourse.

In the proposal stated below, the notions of topic and comment constitute the central criterion of distinguishing between the different structural levels of discourse. They form the general organizing principle of discourse structure, which is considered to be the result of, among other things, the contextual induction of explicit and/or implicit (sub)topic-forming questions. Within this framework, a distinction is drawn between the following structural levels, which correspond to three different types of topic-forming questions: main structure, substructure, and side structure. The main structure of discourse is analyzed as an answer to the leading topic-forming question (or set of leading topic-forming questions) defining the global discourse topic, while substructures are the result of subquestions. Because of the completion function of the corresponding subquestions, these substructures are part of the main structure implying the continuation of the main topic. Side structures, on the other hand, imply a topic digression.

First, our proposal implies that in the case of relevant background material, no side structure is generated. We argue for a broader concept of main structure, implying that all the relevant background material does not belong to intervening side structures but to specific substructures contained in the main part of the discourse. This analysis shows that in cases where this matter has been dealt with in the literature, side structures and substructures have been placed in a single group.
Second, the analysis accounts for an important distinction between substructures, implying a functional asymmetry between them. A distinction is drawn between substructures that contribute directly to an answer to the main topic-forming question and those that have this function only indirectly, which other authors have analyzed as important background material. This functional asymmetry is illustrated by the fact that if the coherence and goal of the text are to be preserved, the former substructures are the only ones that cannot be deleted. These substructures constitute the "goal-satisfying part" of the answer given to the main question. We show that they provide the final comment value to the (discourse) topic defined by the main question. Substructures of the other type have merely a supportive function with respect to a given comment value. For example, they provide a justification of this value in cases in which it has not yet been accepted by the addressee. These substructures are subservient to the goal-satisfying part and, as far as their actual generation is concerned, are highly dependent on the assumptions the speaker has of the addressee's knowledge of the background and situation. However, due to their completion function in the answering process associated with the main question, these structures must be counted as substructures belonging to the main part of the discourse.

Section 2 outlines the theoretical framework in which the main structure-side structure distinction is accounted for. Among other things, it presents the basic principles involved in the process of (sub)questioning. This is followed by a description of topic digressions and the side structures these produce (section 3.1) and a definition of this notion that distinguishes side structures not only from substructures that may or may not have a direct goal-satisfying function but also from other phenomena that (in a similar way) involve a topic shift (section 3.2). Finally, in section 3.3, we discuss the broader concept of main structure, which follows from our analysis of side structures and substructures.

2. The basic framework

In Van Kuppevelt (1991, 1995) we presented a framework in which topicality is the basic organizing principle of discourse structure. The central hypothesis is that the segmentation structure of discourse is determined by its internal (hierarchical) topic-comment structure. As far as discourse production is concerned, this structure results from the process of the contextual induction of explicit and/or implicit topic-forming questions. It is assumed that the questions answered by a speaker (writer) are not always explicitly formulated but frequently remain implicit, not
only in monologues but also in dialogues. As far as addressee-oriented discourses are concerned, these implicit questions are anticipated by the speaker as having arisen in the listener's mind while he was interpreting the preceding linguistic or nonlinguistic context.

The model presented underlies a dynamic, context-dependent, and question-based notion of topic and comment. By definition, every contextually induced explicit or implicit (sub)question $Q_p$ that is answered in discourse constitutes a (sub)topic $T_p$. $T_p$ is that which is being questioned. As will be explained, $T_p$ is a set of possible extensional values (a set consisting of [sets of] persons, objects, places, times, reasons, or other entities evoked in the discourse), one of which is selected by the answer to $Q_p$. Comment $C_p$ is provided by answer $A_p$ and is that which is asked for. If (the speaker assumes) $A_p$ is satisfactory for the addressee, $T_p$ is closed off. However, if $A_p$ is unsatisfactory, it gives rise to subquestioning. As we will see later, this definition implies a uniform conception of topics comprising both the notion of sentence topic and that of larger discourse units.

The questioned set that is the topic consists of possible extensions of the singular or plural topic term in the (syntactic) analysis of the question, for example as expressed by the singular term the one that is laughing in the question Who (is the one that) is laughing? This term represents a contextually given or evoked INDETERMINACY that needs further specification. The set of possible extensions of this term is, for example, the contextual given set of persons $\{\text{Alan, Doris, Julia}\}$. The comment, which by definition is provided by the answer, makes a selection from this set as the extension of this term in the actual situation. This selection is not necessarily uniquely determining, for example if the answer is A woman is laughing.

The process of questioning in discourse involves the following three functional parameters: feeders, topic-constituting questions, and subtopic-constituting subquestions. A feeder $F_n$ is a linguistic or nonlinguistic event that has a specific function, namely initiating the process of questioning in discourse, or REINITIATING this process if, after a while, no more questions arise as the result of the preceding discourse, although the discourse participants wish to continue the conversation. The framework presents the following definition of linguistic feeders: a linguistic feeder is a topicless unit of discourse or one the topic of which is no longer prominent at the moment of questioning. It is demonstrated that if a discourse unit functions as a linguistic feeder it provides, together with associated background knowledge, a set of indeterminacies that is contextually unrestricted by preceding questions. Examples of linguistic feeders are given in the illustrations below.

Every explicit or implicit question that is directly asked as the result
of a feeder functions as a topic-constituting question. Examples are the explicit questions $Q_1$ and $Q_2$ in the dialogue of (1a). Each of these questions is induced by the opening sentence $F_1$, which functions as a linguistic feeder.

(1) a. $F_1$ A: Last Tuesday our company got a new president.
$Q_1$ B: Who is it?
$A_1$ A: It is the former manager of a successful software house.
$Q_2$ B: Why did your company choose a new president?
$A_2$ A: The former president failed to solve the increasing financial problems of the company.

b. Question–answer structure:

\[
F_1 \rightarrow Q_1 \rightarrow Q_2 \\
A_1 \rightarrow A_2
\]

In (1b) a representation is given of the question–answer structure of (1a). Representations like (1b) are generated on the basis of the context orientation of the questions, indicated by a horizontal line reaching from a question representation $Q_i$ (or a representation $\langle Q_i \rangle$ representing an implicit question) to a representation of that part of the preceding discourse to which the question is directed. The representation of an answer $A_i$, on the other hand, is attached directly below the representation of the question it answers. Subscripts refer to the sequential order of the represented entity in the process of questioning. Based on the relationship between questions and topics, a question–answer structure is mapped onto a corresponding topic–comment structure under the general topic–comment function $f_{Q/A}$.

Topic-constituting questions have an autonomous leading role in the process of questioning. They introduce a questioning in discourse that is independent of other questionings and gives rise to a program that must be followed and implemented in order for the discourse to come to a satisfactory end. In this way topic-constituting questions control the development of the discourse. The program implies that the speaker has to provide an answer to the question that will satisfy the listener. As will be explicated further below, a satisfactory answer (uniquely) determines the extension of the contextually provided indeterminacy that gave rise to the question. However, the answering process often proceeds in stages and is carried out by means of subquestioning, which covers all or a considerable amount of the discourse.

In contrast to topic-constituting questions, subquestions do not have an autonomous status in the process of questioning. They are subservient
to the program associated with a preceding topic-constituting question. Their subordinate role becomes evident when the recursive process of their contextual induction is taken into consideration: when a topic-constituting question has been answered unsatisfactorily, it gives rise to a subquestion that, if also answered unsatisfactorily, gives rise to a further subquestion, and so on recursively, until the original, topic-constituting question has been answered satisfactorily. By definition, an explicit or implicit question $Q_p$ functions as a subtopic-constituting subquestion if it is asked as the result of an unsatisfactory answer $A_{p-n}$ to a preceding question $Q_{p-n}$ with the purpose of completing $A_{p-n}$ to a satisfactory answer to $Q_{p-n}$. This completion function of subquestions thus consists in a further reduction of the number of possible extensional values for the original indeterminacy that gave rise to the superordinating topic-constituting question.\textsuperscript{15}

A dialogue containing two subquestions is presented in (2a).

(2) a. $F_1$ A: The Opposition has a good plan to end the state budget shortage.

$Q_1$ B: What kind of plan?

$A_1$ A: The plan's centrepiece is legislation ordering the Governor to cut drastically in most areas of state government.

$Q_2$ B: How much will be cut?

$A_2$ A: Up to 18 percent will be cut.

$Q_3$ B: Which areas will be excluded?

$A_3$ A: Welfare for single mothers and children, and for the aged, blind, and disabled will be excluded.

b. Question–answer structure:

\[
\begin{array}{c}
F_1 - Q_1 \\
\quad A_1 - Q_2 \\
\quad A_2 \\
\quad Q_3 \\
\quad A_3 \\
\end{array}
\]

The questions $Q_2$ and $Q_3$ are direct subquestions of the topic-constituting question $Q_1$, making answer $A_1$ more specific.\textsuperscript{16} However, as can be read from the question–answer structure in (2b), subquestion $Q_3$ is not subordinated to subquestion $Q_2$ because, in terms of, for example, the given definition of subquestions, $Q_3$ cannot be interpreted as a question asked with the purpose of completing the answer to $Q_2$.\textsuperscript{17}

A subquestion $Q_p$ is contextually induced as the result of a preceding unsatisfactory answer $A_{p-n}$, either because $A_{p-n}$ is QUANTITATIVELY unsatis-
factory or because its unsatisfactoriness is of a qualitative nature. In the former case the (positive or negative) answer $A_{p-n}$ is incomplete (e.g. as is the case with the negative answer in the question-answer sequence Which members of the gang have been arrested? Unfortunately not the leader.); more (partial) comment values are needed for a sufficient answer to question $Q_{p-n}$. In the latter case, if the answer is qualitatively unsatisfactory, there are, in principle, two essentially different alternatives, either $A_{p-n}$ is not specific enough (e.g. Which members of the gang have been arrested? Two women.) or has not yet been accepted as a true answer by the addressee and calls for support, such as a justification, a motivation, or evidence (supportive material is needed, e.g., if the answer Two women in the last example gives rise to a discrepancy with existing background knowledge, in the case that the addressee was under the impression that there were no longer any women in the gang).\footnote{18} In all these cases the elaboration that is needed is realized by means of subquestioning.

Quantitative elaborations differ from qualitative elaborations in respect of their relationship to the goal of the higher-order question to which the unsatisfactory answer and the elaboration together form an extended answer. Quantitative elaborations add a new partial comment value to the comment values already provided by the unsatisfactory answer. Together, these values constitute the goal-satisfying part of the extended answer, that is, that part that provides the final comment value to the topic defined by the higher-order question. Qualitative elaborations, on the other hand, do not provide a new value of their own, but contribute to a given value, either by making this value more specific or by providing support for such a value. In contrast to quantitative elaborations, qualitative elaborations imply a functional asymmetry with respect to the part of the context to which they are related. One of them, either the qualitative elaboration or the part of the context to which it is related, constitutes (a part of) the goal-satisfying part of the extended answer providing (a part of) the final comment value. The other represents the goal-subservient part of such an answer. Only goal-subservient parts can be deleted while preserving the goal of the question and the coherence of the (part of the) text that forms an answer to it.\footnote{19} As will be illustrated in section 3.3, this distinction between quantitative and qualitative elaborations gives rise to an important distinction in respect of material belonging to the main structure, namely the distinction between the goal-satisfying part of this structure that in fact provides the final comment value to the topic defined by the question that determines this structure and the goal-subservient parts that are implied by qualitative extensions to given partial comment values.
The model presented accounts not only for the dynamic character of topic constitution but also for that of topic termination. We provide the following principle, called the *dynamic principle of topic termination* (DPTT), which accounts for the standard cases in which topic termination does not result from a disturbance of the questioning process. If an explicit or implicit (sub)question $Q_p$ is answered satisfactorily, the questioning process associated with it comes to an end. As a consequence, the related topic $T_p$ ($T_p = f_{Q/A}(Q_p)$) loses its *actuality* in discourse. As is argued in Van Kuppevelt (1994a, 1994b), satisfactory answers imply unique determination of what is asked for by the question. The consequence of this is that the contextual induction of (further) subquestions is blocked. Naturally, the state of unique determination may be the result either of an inference process involving background knowledge, or of processes of topic narrowing and topic weakening, implying a quantitative or qualitative correction of the original question asked.

DPTT enables us to compute which (sub)topics (and, consequently, which related discourse units) are still open at any point in the development of the discourse. It implies *topic continuity* in the case of subquestioning. This means that the actuality of a (sub)topic $T_p$ is continued as long as subquestions of the (sub)topic-defining question $Q_p$ occur in the discourse. The following schematic example may be seen as an illustration. It demonstrates the dynamics of topic constitution and topic termination by discerning four steps in the development of a question–answer structure. A slash through a question symbol indicates that the question has been answered satisfactorily and that as a consequence (according to DPTT) the topic raised by the question has been closed off. It is assumed that $A_1$ through $A_4$ constitute a satisfactory answer to the topic-constituting question $Q_1$, since no more subquestions are induced after subquestion $Q_4$ has been answered.

(3) (i) $F_1 - Q_1$

\[ A_1 - Q_2 \]
\[ A_2 - Q_3 \]

... 

(ii) $F_1 - Q_1$

\[ A_1 - Q_2 \]

\[ A_2 - Q_3 \]

\[ A_3 \]

(iii) $F_1 - Q_1$

\[ A_1 - Q_2 \]

\[ A_2 - Q_3 \]

\[ ... \]

\[ A_3 \]

(iv) $F_1 - Q_1$

\[ A_1 - Q_2 \]

\[ A_2 - Q_3 \]

\[ Q_4 \]

\[ A_3 \]

\[ A_4 \]
According to DPTT, the topics defined by \( Q_1 \) and \( Q_2 \) are still actual at the time subquestion \( Q_3 \) is asked. However, the answer to \( Q_3 \) results in the closure of the subtopics presented by \( Q_3 \) and the preceding subquestion \( Q_2 \). After subquestion \( Q_4 \) has been answered, the principle predicts that the remaining topics, too, are no longer of current interest in the discourse.

In addition to the distinction between topics and subtopics, the framework captures a notion of a topic of a higher order, namely that of a *discourse topic*. A discourse topic \( DT_1 \) is defined by the set of all topics \( T_p \) that have arisen as the result of indeterminacies provided by one and the same feeder \( F_1 \) (\( DT_1 = \{ T_p \mid T_p \text{ arisen from } F_1 \} \)). It is a set of main, higher-order sentence topics whose actuality in the discourse is continued as long as subordinated topics arise as the result of subquestioning. If only one topic is constituted as the result of a given feeder, as happens in example (2), topic and discourse topic coincide (\( \{ T_p \} := T_p \)). However, a discourse may contain more than one discourse topic. In that case the internal question–answer structure and corresponding topic–comment structure are discontinuous.

Given the assumed topic hierarchy in discourse, it is claimed that this hierarchy corresponds to the hierarchy of structural units in discourse. The segmentation structure of discourse can be made explicit by representing the question–answer structure of discourse in terms of the segmentation of discourse rather than in terms of the context orientation of the questions, as was done previously. An example is (4). It presents the flat structure variant of the segmentation of the discourse in (2).

\[(4) \quad U^{\text{DT}_1}[F_1 U^r[Q_1 A_1 U^r[Q_2 A_2] U^r[Q_3 A_3]]]
\]

\( U^{\text{DT}_1} \) represents the discourse unit for which discourse topic \( DT_1 \) is defined. This discourse unit consists of feeder \( F_1 \) and the discourse unit \( U^T_1 \) for which topic \( T_1 \) is defined. \( U^T_1 \) itself encompasses two subunits, \( U^T_2 \) and \( U^T_3 \), for which the subtopics \( T_2 \) and \( T_3 \), respectively, are defined.

### 3. Side structures as topic digressions

#### 3.1. Description of the phenomenon

The next three subsections focus on the main topic of the investigation: an empirically adequate account of the distinction between main structure and side structure in discourse. Central to our proposal is that no side structure is generated in the case of relevant background material. A consequence of this is that a functional distinction has to be made with
respect to material belonging to the main structure. The analysis will imply two different criteria, one for distinguishing a side structure from the main part of the discourse and one for distinguishing between different kinds of functional substructures that are part of the main structure of complex discourses. The analysis will be given in terms of the framework outlined above, with the main hypothesis that side structures result from topic digressions. We will start this analysis with a description of the phenomenon of topic digressions, followed by a definition of this phenomenon and concluding with evidence for the broader concept of main structure that is implied by it.

Informally expressed, a topic digression occurs when a new topic is introduced as the result of a part of the preceding discourse for which the topic has not yet been dealt with satisfactorily. Consider the nonnarrative discourse in (5a), where an intervening side structure resulting from a temporary topic digression consists of the question–answer pair $Q_2$–$A_2$.

\begin{enumerate}
  \item \begin{enumerate}
    \item $F_1 \quad A$: Today the Ministers of Agriculture of the European Community were not present at the installation of their new member.
    \item $Q_1 \quad B$: Why not?
    \item $A_1/F_2 \quad A$: They had a meeting about the large European butter surplus.
    \item $Q_2 \quad B$: (By the way,) what solution did they propose for this problem?
    \item $A_2 \quad A$: They proposed to undersell this butter on the European market.
    \item $Q_3 \quad B$: Why did they have to meet today?
    \item $A_3 \quad A$: Any postponement would be irresponsible in view of the recent worsening of the problem.
  \end{enumerate}
\end{enumerate}

b. Question–answer structure:

\[
F_1-(Q_1) \quad | \quad A_1/F_2-Q_2 \quad | \quad Q_3
\]

Topic shifts: $T_{F_1}^S \rightarrow T_{F_2}^S$ and $T_{F_2}^S \rightarrow T_{F_1}^S$

\[
(T_{F_1}^S = f_{Q/A}(Q_{F_1}^S) \quad \text{and} \quad T_{F_2}^S = f_{Q/A}(Q_{F_2}^S))
\]
c. Segmentation structure:

\[
\text{MS: } \uparrow_{u^n}[F_1 \uparrow_{u^n}[Q_1 A_1] \quad \uparrow_{u^n}[Q_3 A_3]] \\
\text{SS: } \uparrow_{u^n}[F_2 \uparrow_{u^n}[Q_2 A_2]]
\]

The topic digression is introduced by question Q₂, which, at least in the context of reasonable assumptions about existing background knowledge, cannot be interpreted as a subquestion of Q₁. Question Q₂ is a new topic-constituting question, which achieves a topic shift (see [5b]). It is introduced in the discourse even though the old topic-constituting question Q₁ has not yet been answered satisfactorily. After question Q₂ has been answered, a second topic shift (see again [5b]) is obtained by the fact that the old topic, defined by Q₁, is resumed by subquestion Q₃. The purpose of this subquestion is to complete A₁ in a qualitative way by providing support for the reason given by it.

In the case of a topic digression, there are, in accordance with DPTT, two topics current at the same time. The old topic is still open while a new one is added. The old topic then loses its prominence. As a rule, open topics are always prominent, except when pushed aside by a topic digression.

A topic digression implies that the discourse unit giving rise to the digression has a double function in the development of the discourse. An example is A₁ in (5a). First it functions as an answer to question Q₁. When the new topic-constituting question Q₂ is asked, it functions as a new feeder. At that point the topic provided by Q₁ has lost its prominence because it has been pushed aside by the topic digression. This double function of utterances is indicated by the slash notation.

A topic digression may be temporary or definitive. If temporary and not linguistically marked, for example by a cue phrase like by the way or by a specific prosodic cue marking the opening of a new discourse segment, its identification is easily established later when, after a second topic shift, the old topic is resumed and thus restored to prominence. In the case of topic digressions, restoring the prominence of an old topic is an automatic process. When in (5a), in accordance with DPTT, the new topic defined by Q₂ loses its actuality in the discourse, the old topic constituted by Q₁ is no longer pushed aside. It becomes prominent once again.

(5b) presents the question–answer structure of (5a). It is a discontinuous structure consisting of a main structure and a related, partially overlapping, side structure comprising the interruption. The latter is indicated by the box. In this situation the topic defined by the old topic-constituting question Q₁ has temporarily lost its prominence in the disc-
course. This is indicated by the brackets. (5c), on the other hand, shows the segmentation structure of (5a). It demonstrates two different though interconnecting layers expressing the distinction between the main structure (MS) and the side structure (SS).

3.2. Definition

The hypothesis that side structures result from topic digressions is further developed by defining the notion of topic digression. The following formal definition also captures the generally acknowledged phenomenon (see, e.g., Reinhart 1984) of the recursivity of side-structure formation.

Topic digressions:
The explicit or implicit questions $Q_p$ introduces a topic digression relative to some preceding topic $T_{p-n}$ if it meets the following three criteria:

(i) $Q_p$ is asked as the result of (a part of) the preceding discourse

(ii) $Q_p$ is not a subquestion of the topic-constituting question defining $T_{p-n}$, but achieves a topic shift

(iii) In accordance with DPTT, topic $T_{p-n}$ has not lost its actuality in the discourse at the moment question $Q_p$ is asked

Clearly, in the preceding example (5) the question that introduces the digression, question $Q_2$, meets the three criteria of the definition. First, it is asked as the result of the preceding answer $A_1$. Second, it is not subordinated to the topic-constituting question $Q_1$ with respect to which it realizes the topic digression. Finally, in accordance with DPTT, the topic constituted by $Q_1$ is still open at the moment question $Q_2$ is asked, since, after the digression, the answer to $Q_1$ appears to be unsatisfactory in view of the fact that it gives rise to subquestion $Q_3$. As said earlier, this question is asked with the purpose of providing a specific qualitative extension to the answer given to question $Q_1$.

Criterion (i) is necessary to distinguish topic digressions from true interruptions (Grosz and Sidner 1985) or, what have also been called semantically unrelated interruptions (Polanyi 1985):

(6) John came in and left the groceries
Stop that you kids
and I put them away after he left

A topic digression implies that the program associated with a preceding topic-constituting question is interrupted. But, in contrast to true interruptions like the one in (6), the digression proceeds from the given
linguistic input. Therefore, as has been explained, the digression gives rise to a side structure that is connected to the main structure of the discourse from which the speaker is deviating.

Criterion (ii), on the other hand, is needed to distinguish side structures from *subordinated structures* belonging to the leading part of the discourse. If only criteria (i) and (iii) apply, $Q_p$ is a subquestion of the preceding topic-constituting question $Q_{p-n}$ and not a side question introducing a digression from the corresponding topic $T_{p-n}$. The implicit question $\langle Q_2 \rangle$ in the next example functions as subquestion, meeting only criteria (i) and (iii).

(7) $F_1$ A: Late yesterday evening John got a telephone call.
$\langle Q_1 \rangle$ <Who was it?>
$A_1$ It was one of the girls he met on his last trip.
$\langle Q_2 \rangle$ <Which one?>
$A_2$ The one he likes most.

The relevance of criterion (iii) is to distinguish topic digressions from so-called *associated topic shifts* (Van Kuppevelt 1991, 1995). The topic shift that accompanies a digression belongs to this type and fulfils only the first two criteria. An associated topic shift implies that a new topic is constituted as the result of a new feeder that is provided by the preceding discourse, such as an answer to a preceding question. We gave the following example:

(8) $F_1$ A: We won’t see Jones in the pub this afternoon.
$\langle Q_1 \rangle$ <Why not?>
$A_1/F_2$ He has to meet his daughter at the airport again.
$\langle Q_2 \rangle$ <Where has she been this time?>
$A_2$ This time she has been to Africa to work for VSO.

However, in the case of a topic digression, the new topic is introduced into the discourse at the moment that the old topic has not yet been closed off. This in accordance with DPTT.

3.3. *A broader concept of main structures*

Our definition of topic digressions differentiates substructures from side structures. As a consequence, it implies a broader concept of main structure than is usually assumed, as it also comprises qualitative extensions to unsatisfactory answers that result from subquestions. Evidence for this broader concept of main structure will be given by examples of narrative discourse, since, as mentioned above, research on the main structure–side
structure distinction has mainly been focused on this discourse type. However, our approach also applies to other text types.

First, consider (9a) as an illustration of narrative discourse without intervening side structures and containing only the characteristic temporal material defining this discourse type.21

(9) a. Fj
   Q1 A: What ever happened to RJ?
   A1 B: Six years ago, she mysteriously disappeared.
   ⟨Q2⟩ ⟨Then what happened?⟩
   A2 Though the authorities had a suspect, their investigations stalled.
   ⟨Q3⟩ ⟨Then what happened?⟩
   A3 Two years later her body was found in a North Coast grave.
   ⟨Q4⟩ ⟨Then what happened?⟩
   A4 Now authorities have a chilling new theory about what might have happened to her.

   b. Segmentation structure in three production steps:
   (i) ud t>Fj ut>[Qi A1 u5[⟨Q2⟩ A2 u5[⟨Q3⟩ ...]]]]
   (ii) ud ti>[Fi ut>Fj ul>Qi A2 u5[⟨Q2⟩ A3 u5[⟨Q3⟩ A3] u5[⟨Q4⟩ ...]]]]
   (iii) ud t>Fj u6[Qi A4 u5[⟨Q2⟩ A2] u5[⟨Q3⟩ A3] u5[⟨Q4⟩ A4]]]]

The answers A1 through A4 together fulfil the necessary condition for narratives, namely the communication of a set of events in the sequence of their actual occurrence. The characteristic temporal material they present constitutes the extended answer to the narrative-inducing topic-constituting question Q1.

The narrative in (9a) is analyzed in terms of question–answer structure in the following way. The extended answer to question Q1 is not provided all at once but is achieved in stages by means of subquestioning. As argued above, this is a general phenomenon not restricted to this type of discourse. The answer A1 is unsatisfactory because it specifies only the first event of the narrative, which occurred six years ago. This gives rise to the specific implicit subquestions ⟨Q2⟩, ⟨Q3⟩, and ⟨Q4⟩. Their purpose is to complete this answer in a Quantitative way, thereby providing the necessary final comment value to the topic defined by the leading question that determines the main structure of the discourse.22

The question–answer structure of (9a) is a hierarchical structure in
which the quantitative implicit subquestions \( \langle Q_2 \rangle, \langle Q_3 \rangle, \) and \( \langle Q_4 \rangle \) are subordinated to the main explicit question \( Q_1 \). The hierarchical structure is given in (9b), which presents three relevant steps in the development of the segmentation structure of this discourse. As shown by production step (ii), \( \langle Q_3 \rangle \) is subordinated to \( \langle Q_2 \rangle \) as is \( \langle Q_4 \rangle \) to \( \langle Q_3 \rangle \). In agreement with the interpretation of the temporal adverb *then*, each of these subquestions asks for the remaining (partial) comment values, that is, the set of events following the already communicated ones. Production step (iii) shows that, consequently, in agreement with DPTT all questions are only closed off when the last subquestion has been answered satisfactorily.

In the specific case of (9a), where the narrative contains only the required characteristic temporal material, the problems associated with the distinction between main structure and side structure obviously do not arise. However, consider the following extensions of this example.

\[(9)' a. \quad F_1 \ldots \]

\( Q_1 \) A: Whatever happened to RJ?  
\( A_1 \) B: Six years ago, she mysteriously disappeared.  
\( \langle Q_2 \rangle \) \( \langle \text{Then what happened?} \rangle \)  
\( A_2 \) Though the authorities had a suspect, their investigations stalled.  
\( \langle Q_2' \rangle \) \( \langle \text{Why do you think that their investigations stalled (and were not, e.g., continued in secret)?} \rangle \)  
\( A_2' \) A spokesman confirmed that they had missed the final link.  
\( \langle Q_3 \rangle \) \( \langle \text{Then what happened?} \rangle \)  
\( A_3 \) Two years later her body was found in a North Coast grave.  
\( \langle Q_3' \rangle \) \( \langle \text{Where was it found?} \rangle \)  
\( A_3' \) It was found near Eureka.  
\( \langle Q_4 \rangle \) \( \langle \text{Then what happened?} \rangle \)  
\( A_4 \) Now authorities have a chilling new theory about what might have happened to her.

\[ b. \quad \text{Segmentation structure:} \]

\[
\begin{align*}
\text{MS: } & u_{\pi_2} [F_1 u_{\pi_1} [Q_1 A_1 u_{\pi_1} [\langle Q_2 \rangle A_2 u_{\pi_1} [\langle Q_2' \rangle A_2'] u_{\pi_1} [\langle Q_3 \rangle A_3 u_{\pi_1} [\langle Q_3' \rangle A_3'] u_{\pi_1} [\langle Q_4 \rangle A_4]]]]
\end{align*}
\]

\[
\text{SS: } \emptyset
\]

Here, the problem is the structural status of the extensions \( A_2' \) and \( A_3' \), which are analyzed as answers to the implicit questions \( \langle Q_2' \rangle \) and \( \langle Q_3' \rangle \), respectively. We have seen that according to one point of view (Hopper 1979; Labov 1972; 1981; Reinhart 1984; and others) this material consti-
stitutes side structures, despite the fact that it is important to the characteristic temporal material in the foreground. Apart from this, the background may also contain material that is unimportant in this respect. However, according to the intentional view (e.g. Grosz and Sidner 1986) a side structure can only comprise material of the latter type. The question therefore is what distinguishes discourse units that are relevant to this leading part of the discourse from those that are not, and whether the former should belong to the main structure of the discourse.

According to our framework the questions \( Q_2' \) and \( Q_3' \) are not side questions introducing a topic digression, but questions subordinated to some of the quantitative subquestions that together with the main question gave rise to the story line of this discourse. In contrast to quantitative subquestions, they do not provide a partial comment value of their own but accomplish a qualitative completion to those provided by the inducing answers \( A_2 \) and \( A_3 \). However, their completion function belongs to different types. Subquestion \( Q_2' \) is asked with the purpose of supporting the partial comment value provided by \( A_2 \), which names the event that two years later the investigations of the authorities stalled. It is induced as the result of this value, the truth of which is presumed to be questioned by the addressee. Subquestion \( Q_3' \), on the other hand, is a qualitative question asked with the purpose of making the partial comment value provided by answer \( A_3 \) more specific.

As shown in (9b)', no side structures are generated in the case of the questions \( Q_2' \) and \( Q_3' \). As in the case of the questions \( Q_2 \), \( Q_3 \), and \( Q_4 \), they are subquestions giving rise to substructures that, by definition, belong to the main structure of the discourse. However, they are qualitative subquestions that differ in an essential way from those resulting in the necessary quantitative extensions. Subquestions of the latter type give rise to the final comment value to the topic defined by the main, topic-constituting question. In case of narratives this value comprises precisely the set of events forming the story line.

Before we give an illustration of a variant of (9) that also contains a side structure, we will give another demonstration of the fact that the qualitative questions \( Q_2' \) and \( Q_3' \) are direct subquestions of the preceding quantitative subquestions \( Q_2 \) and \( Q_3 \) respectively.

(9)' d.

\[
\begin{align*}
\langle Q_2 \rangle & \quad B: \quad \langle \text{Then what happened?} \rangle \\
A_2 & \quad \text{Though the authorities had a suspect, their investigations stalled.} \\
S & \quad A: \quad \text{That's a pity, because this case must be solved.} \\
\langle Q_2' \rangle & \quad B: \quad \langle \text{Why do you think that their investigations} \\
\end{align*}
\]
stalled (and were not, e.g., continued in secret)?

... e.

\[ Q_3 \]

\[ A_3 \]

Two years later her body was found in a North Coast grave.

\[ S \]

A: Yes, I know.

\[ *Q_3 \]

\[ B: \]

\( \langle \text{Where was it found?} \rangle \)

...

In the text fragments (9d)' and (9e)' a test sentence \( S \) is inserted just after the answers given to the qualitative subquestions \( Q_2 \) and \( Q_3 \). These sentences \( S \) terminate the topics defined by these questions. In general, the addition of a sentence with such a function makes the appearance of a next question inappropriate if it elaborates on the topic that has just been closed off.\(^23\) This is the case in both (9d)' and (9e)', which means that in (9a)' the qualitative subquestions \( Q_2 \) and \( Q_3 \)' are subordinated to the quantitative subquestions \( Q_2 \) and \( Q_3 \).\(^24\)

Let us now consider the following variant of (9), which in addition to the qualitative extensions also contains an intervening side structure.

(9)" a. \( F_1 \)

\[ Q_1 \]

A: Whatever happened to RJ?

\[ A_1 \]

B: Six years ago, she mysteriously disappeared.

\[ Q_1' \]

\[ A_1' \]

\( \langle \text{What kind of person was she?} \rangle \)

A: She was a nice person.

\[ Q_2 \]

\[ A_2 \]

\( \langle \text{Then what happened?} \rangle \)

Though the authorities had a suspect, their investigations stalled.

\[ Q_2' \]

\[ A_2' \]

\( \langle \text{Why do you think that their investigations stalled (and were not, e.g., continued in secret)?} \rangle \)

A: A spokesman confirmed that they had missed the final link.

\[ Q_3 \]

\[ A_3 \]

\( \langle \text{Then what happened?} \rangle \)

Two years later her body was found in a North Coast grave.

\[ Q_3' \]

\[ A_3' \]

\( \langle \text{Where was it found?} \rangle \)

It was found near Eureka.

\[ Q_4 \]

\[ A_4 \]

\( \langle \text{Then what happened?} \rangle \)

Now authorities have a chilling new theory about what might have happened to her.
A side structure is introduced by question \langle Q_1 \rangle'. It is not subordinated to the preceding topic-constituting question \( Q_1 \), because in terms of reasonable assumptions about relevant background knowledge it cannot be interpreted as having been asked with the purpose of completing the answer to question \( Q_1 \) either in a quantitative or qualitative way. It is a new topic-constituting question that achieves a topic shift, the test being provided by the one applied in (9d)' and (9e)'.

We will now give another example of narrative discourse containing both quantitative and qualitative substructures, as well as an intervening side structure. 25

(10) a. \( F_1 \) ... 
\( Q_1 \) A: What happened in the NHL strike?
\( A_1 \) B: March 29 the club owners made an offer on trading-card revenue which was rejected by the NHL Players Association.
\langle Q_2 \rangle <Then what happened?>
\( A_2 \) The players answered with a strike.
\langle Q_3 \rangle <What does this imply?>
\( A_3 \) This implies that they would have played the final game of their debut season, and that there probably would not have been any Stanley Cup playoffs.
\langle Q_4 \rangle <Then what happened?>
\( A_4 \) Tuesday the owners made a counter-offer.
\langle Q_5 \rangle <What was it?>
\( A_5 \) They offered to give the players the right to sub-license trading-card companies to use players' faces on products.
\langle Q_6 \rangle <Then what happened?>
\( A_6 \) The players dismissed it after meeting for less than two hours.
\langle Q_7 \rangle <What would have happened if this proposal had been accepted?>
\( A_7 \) If this proposal had been accepted, the players would have been asked to return to their teams on Friday and regular season games would have
been resumed on Sunday. The playoffs would have started on April 18.

\[ \langle Q_8 \rangle \]
\[ A_8 \]
They said that they already own the right to their images.

b. Segmentation structure:

\[
MS: \quad \cup^n[F_1 \cup^n[Q_1 A_1 \cup^n[Q_2 A_2 \cup^n[Q_3 A_3 \cup^n[Q_4 A_4 \\
\quad \quad \quad \quad \quad \cup^n[Q_5 A_5] \cup^n[Q_6 A_6 \\
\quad \quad \quad \quad \quad \quad \cup^n[Q_8 A_8]]]]]]
\]

\[
SS: \quad \cup^n[F_2 \cup^n[Q_7 A_1]]
\]

The qualitative substructures are introduced by the implicit subquestions \( \langle Q_3 \rangle \) and \( \langle Q_5 \rangle \), both making their inducing answer more specific. The intervening side structure, on the other hand, is introduced by question \( \langle Q_7 \rangle \), which interrupts the extended answer given to the quantitative question \( \langle Q_6 \rangle \).

Finally, we present an overview of narrative structure, summarizing the relevant distinctions made earlier.

(11) Narrative structure

**Main structure** | **Side structure**
--- | ---
Part forming the story line | Attached elaborations

| goal-satisfying part providing the final comment value | goal-subservient part only contributing to a given comment value | neither goal-providing nor goal-subservient

| introduced by the main question | introduced by subquestions | introduced by side questions

| topic introduction | topic continuation | topic digression

On the highest level a distinction is made between main structure and side structures. The main structure consists of both the characteristic temporal material forming the story line, that is, the material that is called the foreground in most narrative studies, and the attached elaborations that contribute to this part of the discourse, though only in a qualitative way. These elaborations are mostly characterized as background material. We accounted for these distinctions in terms of the topic-comment structure...
of discourse that results from the process of explicit/implicit questioning in discourse.

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Notes

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2. In (formal) semantic studies this specific temporal aspect inherent to narratives is accounted for in terms of, for example, (a variant of) Reichenbach's (1947) notion of reference time (see, e.g., Hinrichs 1986; Moens and Steedman 1988; Partee 1984; and Webber 1988 on this point). In terms of this notion each next element of the set of narrated events has associated with it a truth-conditionally relevant reference time following the reference time of a preceding event.

3. As for side structures, the literature reveals notional differences in term designation. For instance, Clark and Schaefer (1989) use the term side sequences not to refer to what are here called side structures, but to denote phenomena referred to by, for example, Litman and Allen (1987) as clarification and correction subdialogues. In this paper the distinction between side structures and substructures is a central theme. It is accounted for in terms of a topical approach to discourse structure in which the notion of explicit/implicit topic-forming question is central.

4. Labov (1981: 225): “Narrative clauses are independent clauses with verbs in the indicative mood and (in English) one of three tenses: the preterit, the historical present, or the past progressive.”

5. According to Hopper (1979), in (early) Old English, narrative structure is marked by word order. Side-structure (“background”) clauses have the SVO order; main structure (“foreground”) clauses have either the SOV or VSO order.

6. Hopper (1979) and Hopper and Thompson (1980) argue that in Swahili the verbs of sentences belonging to the main structure (“foreground”) of a narrative are marked with the prefix ka-, while the verbs in background sentences are marked with the prefix ki-.

7. According to this proposal, the temporal continuity characteristic for narratives is seen as correlating with the gestalt principle of good continuation, implying that preference is always given to continuous contours or shapes.

8. In fact, the intentional approaches provide a partial solution for distinguishing between goal-satisfying and goal-subservient foreground material, namely a criterion for those cases in which the former material (or a part of it) precedes the latter. Clarification subdialogues are a good example of this. However, the literature reveals both dualistic and monistic approaches in this respect. In Litman and Allen (1987, 1990) subdialogues of this type are accounted for in terms of the distinction made between domain plans and discourse plans, that is, only plans of the latter type underly a clarification
subdialogue, while a uniform account is presented in Lochbaum (1994). Nevertheless, there is the absence of any general criterion that also comprises so-called forward directional processes (Van Kuppevelt 1994a) in which goal-subservient parts precede goal-satisfying parts. Examples of these cases are discourses in which a speaker gradually works toward the goal of the discourse by becoming increasingly specific on the main subject matter introduced in the beginning.

9. Though it goes beyond the goal of this paper to discuss the various definitions of narrative discourse and other text types, one remark must be made in this respect. The analysis that will be proposed implies that the material that ultimately defines a text genre is constituted by the part of the main structure that provides the final comment value to the discourse topic introduced by the question that defines the main structure. As far as narratives are concerned, this part presents the set of events forming the story line.

10. It is demonstrated that there is no difference in acceptability or coherence between texts with only implicit questions and texts to which explicit formulations of these questions are added in the appropriate places. Obviously, the latter risk soon becoming tedious, however.

11. Obviously, these speakers’ assumptions about question induction necessarily imply a model of the epistemic state of the addressee.

12. A discussion of the different notions of the topic-comment distinction is presented elsewhere (e.g. Van Kuppevelt 1991, 1993).

13. Satisfactory answers imply unique determination of that which is asked for by the question. However, as will be indicated later, different configurations of unique determination are possible.

14. In other words, topic is the intension of the topic term in the syntactic analysis of the question, while the comment, if satisfactory, is identified with the extension of this term in the actual situation. As in Tichý (1978), Hauser (1983), and Scha (1983), an individualistic, nonpropositional analysis of questions and answers is assumed. The analysis that provides an account of discourse structure in terms of a dynamic and uniform topic notion is in agreement with the view explicit in, for example, Stout (1896, 1932) and Belnap and Steel (1976) that the topic ("[psychological] subject") of a question is a set of alternatives. It is identical to the contextually provided set of entities referred to by that which can be filled in the corresponding "open proposition" (Prince 1986) introduced by the question.

15. See, for details, Van Kuppevelt (1994a), for example.

16. The subquestions Q2 and Q3 are induced as the result of the two indeterminacies contained in answer A1, namely those associated with the quantified expressions drastically and most, respectively. Their contribution makes the given answer more specific.

17. The developed notion of substructures implies a uniform account of subtask-oriented subdialogues and the, for plan-based theories more problematic, subdialogues (Cohen 1992) such as those described by, for example, Litman and Allen (1990) as clarification and correction subdialogues. In our model both types are generated in the context of unsatisfactory answers to main, topic-constituting questions.

18. A quantitatively unsatisfactory answer A_p^n implies a reduction of the original range of possible extensions to all those that contain (or do not contain, in case A_p^n is a negative answer) the comment value C_p^n. On the other hand, if A_p^n is not specific enough this range has been reduced to only those possible extensions that own the property described by the comment value C_p^n, while if A_p^n needs support this range has been reduced to exactly two values, namely the comment values C_p^n itself and its negation, which comprises the complement set of possible values.
19. The phenomenon we are talking about is that of directionality (Van Kuppevelt 1994a), also called nuclearity in rhetorical structure theory (Mann and Thompson 1988). It refers to the property of asymmetric functional relations between discourse units, that one of them is the functionally prominent one to which the other is subservient. In our framework this phenomenon is defined as a recursive property of discourse relations realized by higher or lower-order explicit or implicit topic-forming questions, namely that in the case of two related discourse units $U_i$ and $U_{i+n}$ functional prominence is given to the unit that provides the final comment value to the topic defined by the higher-order (sub)topic-forming (sub)question $Q_t$ to which $U_i$ and $U_{i+n}$ together form an extended answer.

20. Obviously, topic digressions may also be identified prior to their occurrence by recognizing that the full comment to the topic defined by the leading question has not yet been provided. However, this criterion is restricted in its application to cases in which the old topic must be taken up for reasons of achieving quantitative extensions, which, in contrast to qualitative ones, are a direct function of the question asked.

21. Example (9) is derived from an article in the San Francisco Chronicle, June 7, 1992.

22. Quantitative extensions to a given answer are therefore inextricably bound up with the question asked. Together with the answer they provide the comment value to the topic of the question. Qualitative extensions, on the other hand, are a function of (assumed) background knowledge, which may differ between different speakers and addressees.


24. Obviously, the questions become appropriate if we add a topic-shift-marking phrase like By the way.

25. Example (10) is derived from an article in the San Jose Mercury News, April 8, 1992.

References


