WHAT'S A COHERENT TEXT?

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O. Introductory Remarks

Most research into discourse coherence is concerned with the li-near factors of text organization. Recent studies, specifically Bellert (1970), Daneš (1974), Halliday & Hasan (1976), Gutwinski (1976), Vuchinich (1977), Enkvist (1978) and Reinhart (1980) re-quire that text coherence be treated in terms of linear connect-edness between adjacent sentences. Particularly, they consider linear connectedness or cohesion a necessary condition for text coherence, though most of them (Enkvist 1978, Reinhart 1980, in-ter alia) assume that it is not a sufficient condition.

The present study proposes an alinear hierarchical organization of text. Text organization is viewed here as a function of higher more general cognitive principles governing the mechanisms of processing and storage of verbal material. At the text level, the function of such hierarchical organization is assigned to dis-course entities known as Discourse-Topics (DTs). It will be argued (Section 2) that for a text to be coherent it must be organized in relation to a DT.

In defence of this proposal, we start by rejecting the widely ac-cepted view that text coherence is definable on the linear rela-tions between its adjacent sentences, that is, on the notion of cohesion.

1. Cohesion vs Coherence

Most theories of text coherence consider cohesion a necessary condition for text well-formedness. For reasons of presentation, however, before trying to refute this claim, I start by consider-ing the reasons for the assumption that cohesion is not a suffi-cient condition for text-well-formedness.

Consider first the sequence in (1) below:

(1) Mira lives near Beth. Beth has a moustache. She went on a trip yesterday. Yesterday was a rainy day.

In this sequence the requirement for linear connectedness as postulated by Reinhart (1980) for example, is satisfied, the se-cond sentence of any of the pairs in (1) is cohesive in that its topic element 'Beth' or 'yesterday' is controlled by a previous mention. Yet, given out of context, the string does not accord with our intuition of a well-formed combination and would be mark-ed as odd.

As will be shown in Section 2, the inappropriateness of (1) is due to the fact that it is not clear what DT it discusses. Given

that the requirement for cohesion (or topic control) is satis-fied, the ill-formedness of (1) makes it clear that linear con-nectedness cannot be considered a sufficient condition for the well-formedness of a text. Nor would linear coherence suffice. Coherence, unlike cohesion, cannot be pursued linearly in the form of sequential relation between pairs of sentences. Coherence is not a transitive property. More specifically, given that a sentence (a), for instance, coheres with a subsequent sentence (b), and that (b) coheres with (c), it does not follow that (a) coheres with (c), nor does this assure the well-formedness of the combination of (a)-(c) as a whole. My claim is that linear coherence between adjacent sentences cannot be considered a suf-ficient condition for the well-formedness of a text.

The intransitivity of coherence is illustrated by the inappro-priateness of (2) below where each of the strings (a-b), (b-d) and (c-e) coheres, yet the sequence (a-e) as a whole does not:

(2)(a-b):   (a) Ronit is never home nowadays because he lives near school.

        (b) School, you know, is the center of the kids' social life.

(2)(b-d):   (b) School, you know, is the center of the kids' social life.

        (c) Uri has missed school a lot this year.

        (d) He never showed up at tennis either.

(2)(c-e):   (c) Uri has missed school a lot this year.

        (d) He never showed up at tennis either.

        (e) Orit too has stopped playing chess.

(2)(a-e):   (a) Ronit is never home nowadays because she lives near school.

        (b) School, you know, is the center of the kids' social life.

        (c) Uri has missed school a lot this year.

        (d) He never showed up at tennis either.

        (e) Orit too has stopped playing chess.

The appropriatenes of each of the adjoining pairs compared with the inappropriateness of the string as a whole provides evidence for the claim that coherence is not transitive in that it is not a linear relation. First, there is a relation of coherence between (a)-(b) and between (b)-(c) but not between (a)-(c-d). Moreoever, the text (a-e) does not cohere as a whole. It thus follows, that linear coherence cannot be considered a sufficient condition for text coherence. This in turn suggests that issues that have been dealt with at the intersentential level in an attempt to account for text coherence should, rather, be handled at the level of discourse.

However, to refute the approach that coherence cannot be defined on cohesion it is not enough to show that cohesion is not a sufficient condition for text well-formedness. We further need to show that cohesion cannot be taken as a necessary condition for text well-formedness, either. To this end consider first the appropriateness of (3) below. The text in (3) is devoid of either referential links or semantic connectors, namely, it is not cohesive in the sense defined by Reinhart (1980), and yet it coheres:

(3)

> *Every person constructs a world of his own, from his illu-*
> *sions and hopes, from his love and weakness. Kafka's Prague*
> *was only Prague of his thoughts and eyes, Nahum Gutman's*
> *little Tel Aviv was created by his hands, Nathan Alterman*
> *invented a Jaffa of his own poem ... Everyone lives in his*
> *own Israel, according to his powers and talents ...*
> (Ruth Bondie, Davar 18.12.1981, a Hebrew daily. My trans-
> lation)

The sequence in (3) sound like a coherent text because it is apparent what DT it discusses. Clearly, it is not cohesion that determines the well-formedness of such a passage, but rather its interpretability as a text revolving around a certain topic of discourse.

In principle, the problem with any attempt to distinguish between cohesion and coherence is that it is in fact irrefutable. We have clear intuitions about coherence or the well-formedness of a text, but not an independent notion of cohesion. Given an instance of an incoherenct text (see (1)), it can always be argued that the text is cohesive but incoherent, without there being any way for one to refute this claim or test the intuition underlying it.

2. Coherence and Discourse-Topic

Returning now to example (2), the question now arises as to what makes the pairs in (2) above coherent in isolation (at least intuitively). Conside, again, the pair in (2)(a-b):

(2)(a-b)

Ronit is never home nowadays because she lives near school. School, you know, is the center of the kids' social life.

The sequence in (2)(a-b) could be interpreted as a text segment predicating something about Ronit's behaviour as the topic of the discourse in question. Yet, in fact, (2)(b-d) does not take this direction. The sequence in (2)(b-d), on the other hand, can be interpreted as centering on a different DT, namely, Uri's absence from school:

(2)(b-d)

School, you know, is the center of the kids' social life. Uri has missed school a lot this year. He never showed up at tennis either.

The sequence in (2)(b-d) can easily be extended by the addition of information about Uri's being affected by his frequent absence from school.

In contrast, the sequence in (2)(c-e) cannot be construed as a continuation of a theme in the above direction, but has, rather, a new DT to discuss -- for instance, children's discontinuation of activities:

(2)(c-e)

Uri has missed school a lot this year. He never showed up at tennis either. Orit too has stopped playing chess.

What emerges, then, is that a sequence of utterances which can be interpreted as predicating something about a DT is perceived as coherent. By contrast, utterances that do not constitute a comment on some DT or that cannot be interpreted as being about a DT, do not seem to cohere. This is the case with the sequences in (1) and in (2)(a-e), since they cannot be classified under a unifying entry. As against these, we note the appropriateness of (3), -- a segment that exhibits neither referential link nor semantic connectors. This can be accounted for in terms of "aboutness": the segment can be interpreted as being about a certain DT.

We may turn now to a more rigorous description of the notion of DT. The foregoing analysis specifies the notion of DT in terms of pragmatic aboutness. It is concerned with the cognitive function of DT in the construction of a coherent text.

2.1. On the Cognitive Function of the DT in the construction of the Context Set

Recent approaches to the organization of discourse (Stalnaker 1978; Reinhart 1981, 1983) describe it in terms of effects on the ongoing discourse. Given a piece of information the question that arises concerns the options now available for the utterances that follow. Instead of being examined solely in relation to previous discourse, it is also investigated for its effect on oncoming messages.

While processing a text, the decoder tests oncoming messages for truth value. Propositions which the reader/hearer finds no reason to reject add their content to the pool of presuppositions shared by both the producer and receiver of the text. Stalnaker (1978) views these shared presuppositions as a context set, defined for a given point in the discourse as the set of presuppositions which speaker and hearer accept to be true at that point. Each new message in a discourse adds its propositional content to the presuppositions already in the context set, provided that the decoder does not reject the message on the basis of presuppositions already in his context set. A given set of propositions affects the oncoming discourse in that it determines which of the following messages is allowed to add its content to the context set.

The procedure of testing a proposition for its truth value and the addition of its propositional content to the context set is a dual one. Following Strawson (1964), Reinhart (1981) suggests that these two procedures of _assessment_ and _storage_ be viewed as topic-oriented. She shows that we both assess and store statements as true or false relative to a topic. To assess the truth value of 'All crows are black', for instance, we check the members of the set in question to see if any of them is not black, rather than checking the non-black things to see if any of them is a crow. Though in principle these two strategies are equally legitimate we in practice follow the first because we view the information that 'All crows are black' as classified under crows, and it is our knowledge of crows that we search in order to assess this proposition. The strategy of assessment the truth value of a given message is thus topic oriented, in the sense that it is our knowledge of the topic of a given proposition that affects the process of verification.

The addition of the propositional content of a statement is similarly relative to a topic. It is implausible, for reasons of cognitive economy to assume that we store _lists_ of propositions (the range of recall being seven items or so) and Reinhart thus suggests that the storage procedure, too, be construed as topic-oriented. She argues this by reference to the catalogue metaphor, where topic functions as the entry under which we classify and store information. Topics, then, instruct the reader how to construct a context set: having assessed a proposition relative to its topic constituent, he stores it under an entry corresponding to that topic.

In view of Reinhart's description of the cognitive function of sentence topic, we suggest that DT be viewed as the organizing principle of the context set of a text. Given Prince's (1979) assumption that a text is a set of instructions from a writer to a reader on how to construct a particular discourse model, we attribute to DT the cognitive function of an entry which is interpreted as an instruction from a writer to a reader on how to construct a discourse model. Thus, a DT functions as an entry in relation to which propositions in a context set are assessed and stored. In this sense a set of propositions is said to be _about_ a DT.

2.2. On the Propositional Nature of DT

Even though I cannot at this point propose a formal procedure for deriving the DT of any given text segment, we may examine the question related to the minimal unit that can serve as DT. I argue that DT be formulated in terms of propositions or argument-predicate nominalizations, and not in terms of NPs alone. In fact, such claim follows from the refutation of the claim that coherence is definable on the notion of cohesion. Note that with the notion of DT as an NP it is impossible to account for the illformedness of (4) below:

(4a)

They say Mary's very smart.

(4b)

Yeah, she has a nice handwriting and she lives with her uncle und she dyes her hair every now and then.

The text of (4) is a combination of random comments about Mary. Yet the mere fact that all the utterances in the string can be interpreted as being about Mary does not ensure a coherent reading of it as a text. Thus if DT is taken to be an NP -- in this case "Mary" -- the defectiveness of (4), which can be interpreted as a discourse about Mary, cannot be accounted for. In order for a text segment to be coherent, it is not enough for it to be interpretable as being about a given NP which constitutes its DT. Its range of predicates must also be subsumable under the discourse topic -- which then must take the form of a predicate and argument.

For another example, note the passage in (5) below, taken from _Ida_ by Gertrude Stein. The text is cohesive in that all its sentences share the same sentence topic. However, this NP topic cannot function as DT, and the fact that the segment cannot be assigned a coherent reading lies in that its various predicates cannot be classified under any propositional DT:

(5)

> _This first time she was married her husband came from_
> _Montana. He was the kind that when he was not alone_
> _he would look thoughtful. He was the kind that knew_
> _that in Montana there are mountains and mountains_
> _have snow on them. He was not born in Montana. He_
> _had not lived in Montana. He had to marry Ida and_
> _he was thoughtful._
> (p. 49)

Thus a coherent text segment which seems to revolve around a given NP as its DT must, in fact, be a text that has both that NP _and_ a subsuming predicate as DT[1].

2.3 On the Location of DT in a Text Segment

We have already stated, along the lines suggested by Reinhart (1981, 1983) that we view DT as the entry under which a set of propositions is taken to be classified -- an entry which organizes the context set of a given text segment. In this view, the set of propositions in question represents the writer's knowledge of that constituent. The decoder in turn interprets the text segment as a predication about the particular DT. The question now arises as to how the decoder identifies or constructs the DT of a given text segment.

Given findings of primacy effect[2] and hypothesis-testing strategies[3], it is plausible to assume that the reader will look for the DT proposition in segment <u>initial</u> position. Each subsequent incoming proposition will be processed in relation to that concept already in the reader's mind; it will be tested for classifiability and stored under that governing entry.

The research of Kieras (1982) on reading strategies provides evidence in this direction. He shows that readers tend to identify the first proposition in a passage as the 'main idea' or 'theme' statement.

When, however, a text lacks an explicit DT proposition, the reader will rely on other surface-structure devices in order to construct one. Below I argue that it is cohesion that is functional in this respect (Section 5) (and see, too, the evicence from Kieras (1980)).

In sum, a DT is presumably the first constituent in a set which organizes the set hierarchically. Each subsequent proposition that is about to be added to the context set is both verified and stored in relation to that DT.

3. A Discourse Model for a Text

In view of findings concerning the primacy effect (f.n. 2) and hypothesistesting strategies (f.n. 3) and along the lines suggested by Stalnaker (1978) and Reinhart (1981, 1983) (Section 2.1), we view the construction of the context set of a given text as a process of assessing and storing incoming messages under the proposition(s) in (segment) initial position. Construction of a context set for a string of linearly presented pieces of information starts by attributing the cognitive function of a catalogue entry to the proposition(s) which appear first in a text segment. The first message in a text segment, then, is the DT of that text-segment under which all subsequent propositions are classified and stored. It functions as the hypothesis in relation to which all incoming information is tested and interpreted. However, when the first hypothesis is no longer tenable or, rather, when an incoming message content is no longer subsumable under a given DT, it either opens a new entry under which subsequent information will be stored, or it is signalled as unrelated.

If it is the case that a new proposition is added to the context set, it is either:

a. fully integrated into the set of propositions predicating something about the given DT, or

b. the above proposition predicates something about part of the given DT. In such cases it is necessary to reformulate the DT. This is illustrated in Perry's (1977) analysis of Bialik's 'inverted' poems (and see also Section 5).

Extending Reinhart's (1981) proposal, we can specify a context set as non-defective insofar as the addition of a new proposition either retains or necessitates reformulation of the DT already established, so that the newly formed set can be taken to predicate something about that (reformulated) DT. When the hypothesis as to the DT no longer holds, there will be a DT shift. The final message which no longer fits the given (reformulated) hypothesis starts a new one as specified in (a) and (b) above.

4. Text Relevance and Coherence

Given our tentative notion of DT (Section 2.1), we can now try to formulate the conditions for text coherence:

(6)

A text fragment is coherent if each of its segments is either (a) interpretable as being about a DT,

or

(b) signalled as a digression by a digression marker.

The relation to DT described in (6)(a), (b), is analysed here as a Relevance requirement. That is, Relevance constitutes a necessary condition for text coherence. Other assumptions concerning local interrelations between adjacent sentences or the requirement of consistency (Reinhart 1980) are disregarded for the moment.

We already noted the requirement for Relevance stipulated in (6) (a) in Sections 1, 2, 2.1 above[4]. Consider, now, the requirement for connectedness suggested in (6)(b). Given (6)(a), a text segment will be considered defective in case at least one of its propositions cannot be interpreted as being about the given DT. Recall (2)(a-b) and (2)(c-d), which we repeat below:

(2)(a-b)

Ronit is never home nowadays because she lives near school. School is the centre of the kids' social life.

(2)(c-d)

Uri has missed school a lot this year. Orit too has stopped playing chess.

We saw that (2)(a-b) and (2)(c-d) do not satisfy the Relevance requirement because put together they cannot be interpreted as predicating something about an underlying DT (Section 1 above). Moreover, condition (6)(b) can be seen to apply since the oddity

of (2) as a unified continuous text can be corrected or compensated for by the introduction of a connector marking the digression. Consider (7) below as an improvement on (2)(a-d):

(7)

Ronit is never home nowadays because she lives near school. School, you know, is the center of the kids' social life. Oh, by the way, I forgot to tell you that Uri has missed school a lot this year and that Orit, too, has stopped playing chess.

Another example is provided in Dascal & Katriel's discussion of digression (1979: 211-212), repeated here as (8). A is explaining to B a certain view on the nature of knowledge. After stating the view, he presents an example of a justified claim to knowledge, namely, (8)

(8)

A: John knows that it is raining in Honolulu.

B replies
Case 1

B: On what grounds can he said to know that?

Case 2

B: By the way, how long has it been raining in Honolulu?

Dascal and Katriel, citing Schutz (1970), regard Case 1 as 'topically relevant' and Case 2 as 'marginally relevant'. They consider texts which contain a degression to be well-formed so long as the digression is 'marginal'. I regard the same text segment (Case 2) as well-formed not because there is some semantic (although marginal) relevance between the utterances of A and B, but because of the presence of an overt operator, 'by the way' which indicates that there is a digression (of whatever degree). In general, we find that in order to preserve coherence when the Relevance requirement is violated, written texts utilize overt operators marking the digression.

Thus, note how the text in (10) is an improvement on the one in (9), where (9), but not (10) lacks digressive connectors. The text in (10) is a translation of a text segment of Ludvik Vaculik (1970), Morcata which deals with the apparently unrelated topics of pets and the bank. In shifting from one DT to another, Vaculik employs digressive connectors. This is why the text in (10) is coherent while that in (9) is not:

(9)

> *This engineer Halavatzek, a person whom no one notices, sat one day at a piece of graph paper and wrote down the account he had relentlessly developed for a couple of months. What he found out excited the state bank. It has long been known that the money that the guards confiscate is not to be found in the cashier the next day... Consequently we will reach a stage of unemployment in our*

> *bank. This is engineer Halavatzek's prediction and this is the good we are to expect next year.*

> *I am lying on the floor by my pet and watching it. Watching it intensively I experience a state of mind that I once experienced but have forgotten ...*

(10)

> *This engineer Halavatzek, a person whom no one notices, sat one day at a piece of graph paper and wrote down the account he had relentlessly developed for a couple of months. What he found out excited the state bank. It has long been known that the money that the guards confiscate is not to be found in the cashier the next day ... Consequently, we will reach a state of unemployment on our bank. This is engineer Halavatzek's prediction and this is the good we are to expect next year.*

> *Let's not discuss the bank, kids, let's talk of pets, which are much nicer and less upsetting. I am lying on the floor next to my pet and watching it. Watching it intensively I reach a state of mind that I once experienced but have forgotten ...*
> (p. 22)

In the same way (12) improves on (11) since (12) provides for connectedness between apparently unrelated (i.e. irrelevant) text segments which (11) does not:

(11)

> *In the days following, the new pet's health did not improve.*

> *The state of affairs at the bank was terrible, but it wasn't my fault. There the guards confiscate everyone's money and deliver it somewhere, and again, nobody knows anything about it ...*

(12)

> *In the days following the new pet's health did not improve, and I do not feel like talking about pets. Let's talk about the bank instead.*

> *The state of affairs at the bank was terrible but it was not my fault. There the guards confiscate everyone's money and deliver it somewhere, and again, nobody knows anything about it ...*
> (p. 41)

In sum, for various text segments with different DTs to meet the relevance requirement, they must be related to an underlying DT in terms of aboutness; they must be interpretable as being about a topic which the text as a whole is in fact about. However, those which are not, can still be considered coherent on condition that they mark the digression from DT as such.

5. The Function of Cohesion

In view of our claim that coherence is definable on DT and is therefore independent of cohesion (Section 1), it is necessary to explain why texts tend nevertheless to be cohesive. That is, the function of cohesion must still be accounted for. I suggest that we regard cohesion as a derivative notion stemming from a higher principle of coherence. It is feasible that cohesion and most particularly topic control play a role in specifying and constructing the DT. In practical terms, Kieras (1981) found that highly cohesive texts in which the dominant linking device operates through the control of topics are easier to process than ones lacking such connectedness. This seems to follow from my assumption that cohesion is a by-product of coherence, its function being to help mark or identify the DT.

Further indication of the auxiliary function of cohesion is Ariel (in prep.). Ariel found that when the DT of a given paragraph is not new, the anaphoric expressions whose antecedents occur outside that paragraph are references to the DT. In other words, when the paragraph-DT is not specified within the paragraph by a full reference (a name), a great number of cohesive devices (pronouns, definite descriptions, deictics) help construct it[5].

It is interesting to note that even in cases where the DT gets reformulated in the course of reading, the new, reformulated DT will also be partly cohesive with the sentence topics of the text or text segment as a whole. Consider, for instance, Perry's analysis of a poem by a Hebrew Poet (1976: 61). Perry claims that the first two stanzas of "Lo zaxiti ba-or min ha-hefker" ("I was not allotted the light by chance") are (seemingly) about a DT or 'frame' to use Perry's terminology, such as 'the originality of the light'. Given such a DT, the two segments seem complete and well organized (i.e. coherent). But as the reading process unfolds, the 'frame' which allows a proper interpretation of the entire text as a whole with a single unifying DT, turns out to be 'the privacy of the light' (p. 63). Addition of the last stanza to the first two requires a reformulation of the previous DT. What emerges is that this reformulation takes place within the range of predicates, leaving the arguments cohesive with one another. The question thus remains whether the sentence topics of the major part of the poem are also cohesive with the DT. And indeed, the poem preserves thematic unity through the repetitive use of the word 'light' which constitutes the sentence topic of almost all the sentences in the poem, hence rendering quite a number of sentences or sentence topics cohesive with the DT.

6. Summary

I have argued that coherence is definable on DT, hence ruling out the possibility that cohesion is a condition for text well-formedness. Extending the analysis of Reinhart (1981), I suggest that DT be viewed as the most economical proposition in the context set in relation to which all subsequent propositions are assessed

and stored. Surface connectedness between adjacent sentences is, however, functional in constructing the DT and was shown to facilitate processing.

In view of the linearity of learning and perception, I hypothesize that there is a linear construction of alinear organization of verbal material in a context set. I suggest that the construction of the context set be viewed as a series of testings at each incoming proposition for its adjustability to a given entry on the one hand, and for its effect on the oncoming discourse, on the other.

A coherent text, then, is a set of propositions which is interpretable as a predication about a given DT. Procedures for a formal derivation of DT require further research.

Footnotes

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1) Following are recent treatments of DT which prima facie, at least seem to hold the same view concerning the propositional formulation of DT:

Keenan & Schieffelin (1972: 341) approach the notion of DT in terms of presuppositions. Hence, for them, Topic of Discourse is of propositional formulation. Their analysis of a discourse segment is repeated here for convinience:

a. Mother: Well, we can't hold it on like that. What do we need? Hmm? What do we need for the diaper?

b. Allison: Pin/

c. Mother: Pin. Where are the pins?

d. Allison: Home./

"Here the discourse topic is established at (a), (we need something for the diaper) and is collaborated on in (b). In (c), Allison's mother passes a different but related question (of immediate concern). It is being elicited, 'the pins are somewhere', presupposes that 'there exist pins'". As I read Keenan & Schiefflin, they propose a linear concatenation of pairs of sentences/utterances (a→b), (c→d) whose intersection takes the form of presuppositions.

Schank (1977) also holds the view that DT should be formulated in terms of propositions. In his opinion, DT is an intersection of concepts shared by two adjacent sentences. But rather than concentrating on the DT of a given pair, he proposes rules for topic shift. Implicitly, then, he is concerned with the effect a given utterance has on the oncoming discourse,

with the options open for text progression given a set of propositions. Whether the next utterance involves an intersection of concepts at the concrete or abstract level determines the nature of the DT which the two propositions share.

Another step in this direction is taken by van Dijk (1976). Arguing in terms of aboutness, van Dijk suggests that sentence topics be formulated in terms of NPs and DTs in terms of propositions. This distinction, however, is only intuitively accounted for. Out of the two alternatives -- that of specifying DT as an NP or as a proposition -- he opts for the latter in a fashion which appears arbitrary. According to van Dijk, a DT is "an acceptable summary of the story fragment which is an account of the most important fact(s) of the story ..."; it is "a construct 'taking together' semantic information from the discourse as a whole". Van Dijk believes that he can derive DT, namely, a summary, by means of macro rules. Subsequently, it is necessary that a DT be "a full proposition" as the sequence as a whole is about both the (identical or central) referent and the major predication of that referent (van Dijk 1977).

Sabsay & Foster (n.d.) likewise agree that the topic of a discourse segment is some idea or proposition. They find that to take the DT to be an NP is too narrow, as it excludes the range of predications about that referent.

Further confirmation for the claim that DT is better formulated as a proposition than as an NP comes from Turkish, a language which allows both null subjects and pronominal subjects. Enc (1982) shows that a sentence with pronominal subject signals topic change, and she takes this as evidence that topics are propositions and not NPs. Consider, for instance, her analysis of the following discourse fragment:

a. Ali is going to Ankara tomorrow.

b. He's been very absentminded lately.

Enc maintains that the use of a pronoun in (b) signals a topic shift. Although both topics are about the same person, the pronoun in (b) indicates that the topic pursued is not 'Ali' but 'Ali's absentmindedness', whereas the previous topic was 'Ali's trip to Ankara'. Use of pronominalization thus suggests that the topic cannot be an NP but must constitute a full proposition.

2) Primacy and recency effects have been traced in recall items in serial position. A list of unrelated words is read to a subject who is asked to recall the list in any order desired. The results show that the difficulty of learning or remembering a specific item is determined by a serial position occupied by the item in the list to be learned. The largest number of correct responses are made at the beginning of the list, with the end of the list producing almost as many correct responses as the beginning. The enhanced accuracy of the first few serial positions are said to represent primacy effect, and of the last

ones, a recency effect. The middle items of the list are least likely to be recalled. (See Figure 1):

SERIAL POSITION
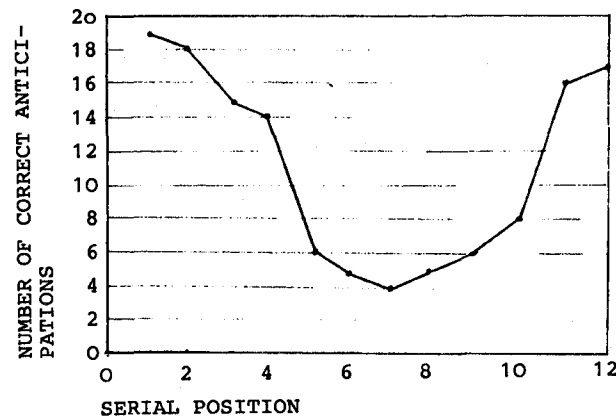
Results from a hypothetical experiment in serial learning

Figure 1

(Taken from Murdock, 1962)

However, primacy and recency effects seem to be dependent on the amount of structure of the material, thus they do not apply in recalls for stories. And in fact, the serial position curve for stories is different from that found in the recall of lists of words as shown by Mandler (1978) and Mandler & Johnson (1979).

Despite such claims against the possibility of measuring serial position effect in structured material, it is still plausible to assume that -- given the effects of primacy and recency on meaningless material -- what is stored is influenced by the order of presentation. Consequently, what is positioned either at the beginning or at the end of a sequence is most likely to be better recalled than material in non-boundary position. For a more extensive discussion of recency effect in paragraph see Giora (1983b), and of primacy effect in Perry (1979).

3) The sequential nature of learning and perception of linguistic material is only one factor in verbal behaviour. What seems equally to affect the organization of texts is the alinear order of storage. The analysis of an alinear organization is based on a certain concept of processing which holds that the learner is a decoder who participates actively in the process of forming concepts. In particular, one such approach, referred

to as the hypothesis testing theory, views the learner as responding on the basis of some hypothesis whose adequacy he sets out to test. For a reader to be engaged in the act of processing is to act on hypothesis which he checks and corrects continuously. There is a considerable evidence that learners do in fact make use of hypothesis-testing strategies as Bruner, Goodnow and Austin (1956) show. In their research the subject tackles any problem by deciding on a tentative hypothesis which he then sets out to verify. The hypothesis is tested against subsequent examples and non-examples. If the hypothesis fails it is rejected and replaced by a new one. This process continues until the subject arrives at a hypothesis that seems to fit all the examples and non-examples.

The procedure is such that a hypothesis is held until it is found to be wrong. At each stage, the subject is left with a hypothesis which embodies or subsumes all subhypotheses that are tenable up to a point.

Presumably, this strategy of selecting and revising hypotheses is only one device among others. Yet when followed consistently it was found that subjects arrive at problem solution in a minimal number of decisions and tests.

Further illustration of reading strategies comes from Perry's investigations into the dynamics of reading a literary text. Perry (1967, 1979) present a fullfledged model of hypothesis construction in the reading process with a special emphasis on the effect of the initial stages of reading on the processing of the text as a whole.

4) The reduction of the notion of relevance to the notion of DT is clearly not a fully adequate solution. In view of the fact that the procedures deriving a DT are not yet formally statable, such an approach is no more than suggestive of the direction for further research. Yet, it is a suggestion in the right direction. To see this, let us compare the approach outlined here to other analyses of relevance.

Other approaches try a reduction of relevance to less obscure notions such as the concepts of foreground-background (van Dijk), informativeness (Sperber & Wilson), or cohesion in the sense of semantic connectedness (Dascal).

Thus, van Dijk (1979) views as "relevant" the elements of a text that are found important by a reader. As a result, the notion of relevance is a matter of degree: Some elements are more relevant - those that are akin to the perceptual Figure - while others are less relevant, i.e. of background nature. In van Dijk's work, relevance is thus treated in terms of foreground-background relations, suggesting that what is more striking or more surprising is more relevant, given our knowledge of the world in question.

For Sperber & Wilson (forthcoming), the degree of relevance is a function of the number of implications entailed by a proposition in a given context. For them, a proposition is relevant in a context if and only if it has at least one contextual implication in that context. In addition to the particular proposition and a finite context, the act of processing involves a set of non-trivial inference rules as input. These rules derive the full finite set of non-trivial implications of the union of the proposition with the context as an output. The more contextual implications a proposition has in a context, the more relevant it is in that context. In cases where two propositions have the same number of contextual implications, their relative degree of relevance is determined by the amount of processing in the sense of the number of steps taken to derive the said contextual implications. In terms of human organism, it is probably related to the amount of effort made.

For Sperber & Wilson, then, the relevance of a proposition in a context is a matter of degree too. It is a function of the number of its contextual implications weighted against the amount of processing required to derive these contextual implications. The maximally effective exchange of information is thus one that yields the maximum amount of information per minimum of processing.

Although approached in quite different terms, Sperber & Wilson's conception of relevance reduces it to the notion of informativeness, no less than does van Dijk's. Though this is a legitimate stance it is very different from one that views relevance in terms of relation to DT. It is also less efficient than such approach. Despite the intuitive appeal of such a logical mechanism for distinguishing between various degrees of relevance, the judgements they make along these lines do not seem to accord with our intuitions. I suggest, rather, that an approach that views the coherence of a text in terms of relation to a topic would be more plausible.

Consider the relevance of (2), (3) and (4) below to the context of (1). (1) and (2) are cited in Sperber & Wilson, while I have added (3) and (4). (2), (3) and (4) differ from one another in the number of contextual implications, but not in the amount of processing they require:

(1) C1 Jackson has chosen the date of the meeting.

   C2 If the date is February 1st, the chairman will be unable to attend.

   C3 If the chairman is unable to attend, Jackson's proposal will be accepted.

   C4 If Jackson's proposal is accepted, the company will go bankrupt.

(2) The date of the meeting is February 1st.

(3) The date of the meeting is kept secret.

(4) The company will go bankrupt whatever the date of the meeting.

According to Sperber & Wilson (2) has four contextual implications in the context of (1) but (3) and (4) do not have any non-trivial contextual implications in the context of (1). Yet intuitively (2), (3) and (4) all seem equally relevant in relation to the context of (1). In spite of the difference in degree of informativeness, the intuitively felt similarity in degree of relevance of all these propositions, (2), (3) and (4) can be explained within a theory that views relevance as a relation to DT. Given the context of (1), each proposition in turn seems to predicate something about a DT. By contrast, a theory that views relevance as informativeness and aims to account for relevance in terms of number of contextual implications, seems unable to explain the fact that (2), (3) and (4) are all felt to be relevant to the context of (1).

Closer to our approach is the attempt by Dascal (1979) to treat relevance in semantic terms. For him, characterization of the notion of relevance involves concepts such as 'reference', 'aboutness', 'meaning relations', 'entailment', etc. He further distinguishes between 'topical' and 'marginal' relevance thus: "Something is topically relevant at time t for a subject S if it is at the center or focus of S's field of attention at t. What is not topically relevant but still somewhere in the field of attention of S, say, in the 'horizon', will be said to be marginally relevant for S at t". (1979: 159). Analysis of his examples, however, leans largely on cohesiveness to assure any degree of relevance.

The approach of Sabsay & Foster (n.d.) seems much closer in orientation to ours. Following Reinhart (1981), they also argue that relevance is a relation to DT. They take the notion of DT to be functional in the organization of the information in the context set, and argue that it should be defined on 'aboutness'. Despite the basic agreement, we differ in explanations and projection.

5) The findings presented in Ariel (in prep.) are based on three texts: Terkel (1967) which is a mere recording of people interviewed, Har-Even (1982) which is a short story and Pedatzur (1983) which is a newspaper article.

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