Segmentation and segment cohesion:
On the thematic organization of the text*

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Abstract

Most linguists concerned with cohesion have focused on the linear relations between sentences. This study is an attempt to extend the notion of cohesion beyond the sentence level, by viewing it as a requirement of the text for connectedness between segments larger than a sentence, such as paragraphs or whole chapters. Of the various concatenation devices listed in Daneš (1974), the most elementary one is the presentation of a given theme in a previous rheme constituent. We will consider here only this type of connectedness, arguing that a prior presentation has two functions: a cohesive one and an informational one. As for the cohesive role, we have elaborated only on such phenomena as exhibit concatenation of new information in segment final position (irrespective of the nature of the segment). We have further shown the extent to which concatenation of new topics affects text segmentation. Contrary to the view that allows for a text to be segmented before the introduction of a new discourse topic (Sanford and Garrod, 1981; Longacre, 1979; Chafe, 1979), segmenting the text after the introduction of the new/future discourse topic is found to be a widespread phenomenon that prevails at the various levels of the text. Functionally, we have argued that prior concatenation of future discourse in segment final position is motivated by considerations of informational structuring. Segmenting a text after the introduction of the future discourse topic endows the latter with foreground status. Apart from discussing cohesion at the various levels of the text, this paper is an attempt to show that segment final position, of whatever nature, is a parmeter determining informationally foreground status.

1. Introduction

Most linguists concerned with cohesion have focused on the linear relations between sentences. This study is an attempt to extend the notion of cohesion beyond the sentence level, by viewing it as a requirement of the text for connectedness between segments larger than a sentence, such as paragraphs or whole chapters. Unlike the view that sentences which introduce new segments such as paragraphs or chapters to the text are exempt from the requirement of cohesiveness (Reinhart, 1980), we assume that the requirements for cohesion which apply to segments such as paragraphs and chapters are similar to those applying to sentences.

Disregarding details of the principles governing segmentation, we assume, for purposes of the present discussion – following Sanford and Garrod (1981), Chafe (1979), Longacre (1978) and Hrushovski (1976) – that one of the motivations for discourse-segmentation is the need to change or shift discourse topics. Investigation of the connective devices used to achieve discourse-topic-segmentation is of interest, as it makes it possible to extend the number of discourse topics which account for the thematic progression of a given discourse.

As there is no acceptable definition of discourse topic at this stage of the research, we intuitively assume a notion of discourse topic associated with the notion of 'frame' (Minski, 1975), 'frame of reference' (Hrushovski, 1976) or 'world' (Chafe, 1979) or, in terms of 'aboutness', that which the segment can be interpreted as being about (van Dijk, 1979; Reinhart, 1980).

This work adopts the principles suggested by the Prague linguists such as Daneš (1974) and Firbas (1975), who assume that the location of constituents in the sentence sequence determines their relative informational status: sentence final position is marked as foregrounded or upgraded, while sentence initial position is marked as backgrounded. We further maintain that the topic – the element the sentence is interpreted as being about (Reinhart, 1980) – tends to occupy an initial position but is not to be identified with background information, even though its informational status is downgraded. However, rhematic or foreground information, which is that part of the sentence that predicates something about the topic or adds new information about it, tends to occupy a final position and is considered upgraded in terms of informativeness.

Starting at the sentence level (Section 2), I will delineate one model of linear connectedness suggested by Daneš (1974). This device will serve as a basic model for the description of other cohesive devices which follow the same principle and which are used at the level of the paragraph and the chapter, too. (Sections 4.3; 4.4)

This study focuses on one device only, which seems to have a similar function at the various levels of the text. It does not discuss motivation for segmentation (for a research in this direction see Hrushovski, 1976), nor does it discuss segment cohesion as a requirement of a coherent text. (For an attempt to discuss this see Giora, 1981). These notions are latently assumed here. The study deals with the linear organization of the various text constituents.

2. Background: The linear organization of the text

The most elementary organization of the text *à la* Daneš (1974) is viewed as the linear progression from the rhematic section of sentence (n) to the thematic section of (n + 1). This view of inter-sentential thematic relations follows from the principle of proceeding from old/given to new/foreground information, which requires that a sentence, should start with old/given information (theme = T1) and end with new information (rheme = R1). In the next sentence, the theme (T2) is, in fact, the rheme (R1) of the previous utterance. The linear organization of the themes in the text can then be delineated as following:

$$T1 \rightarrow R1$$
$$\downarrow$$
$$T2 \ (=R1) \rightarrow R2$$
$$\downarrow$$
$$T3 \ (=R2) \rightarrow R3.$$
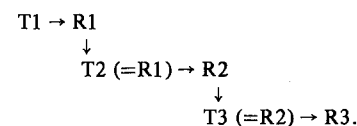
Consider, for instance, the thematic progression in Dylan Thomas (1965: 52):

(1)   One afternoon, in a particularly bright and glowing August, some years before I knew I was happy, George Hooping ... Sidney Evans, Dan Davis, and I sat on the roof of *a lorry* ^{R1} *travelling to the end of the Peninsula.* ^{T2} *It* was a tall, six wheeled lorry, from which we could spit on the roofs of the passing cars and throw apples and *stumps* ^{R2} *at women on the pavement.* ^{T3} *One stump* caught *a* ^{R4} *man* on a bicycle ... And if the lorry runs over ^{T5} *him,* I thought calmly ... *he* will get killed ...[1]

(Dylan Thomas, *Extraordinary Little Cough*)

Connectedness of this sort is referential (Reinhart, 1980), establishing itself through a referential repetition of an element that has appeared in the immediately preceding utterance. In the following sections, I will show that such a cohesive principle, i.e. the introduction of a new future topic in the foreground section of a given segment, is manifested not only at the sentence level, but at all other levels of the text as well. First, I discuss the concatenation of new information in the most elementary segment of the text — the sentence (Sections 3–3.4); then the introduction of new information in the most elementary segment of the poem — the line (Section 4.1); and finally, how the same device operates in larger segments such as the stanza in a poem or the paragraph (Section 4.3) and the chapter (Section 4.4) in narrative prose.

3.   Devices for introducing new topics to the discourse at the sentence level

We have seen (Section 2) that the most elementary device used for introducing future topics to the discourse is to present them in the foreground section of a given sentence. In this section, I will consider certain possible variations of this device for achieving topic introduction and topic shift in sentence final position. In Section 3.1 I will present the device of introducing new topics in final syntactic subordination.

3.1.   *Informational dominance of syntactic subordination*

Given the theories stemming from the Prague School of Linguistics, sentence final position has been accepted as the dominant parameter determining foregrounded status. It is, however, generally recognized that the syntactic parameter, namely, the (one-to-one) correspondence between matricity and foreground information on the one hand, and subordination and background information on the other hand, is crucial in determining the relative informational status of a constituent, (see Hopper and Thompson, 1980, *inter alia*). Erteshick-Shir and Lappin (1979) argue against this view, claiming that the informational status of a constituent is primarily determined by its intension. They argue that subordinate clauses which exhibit semantic complexity may have dominant reading as their associated matrices. That is, the more complexity introduced into the matrix, the more difficult it is to interpret the

subordinate clause as dominant, and *vice versa*. Ziv (1976) likewise argues that content may outweigh form. She shows that the foregrounding of a relative clause is highly dependent upon the degree of rhematicity.

As against all the above, examination of a set of semantic connectors, which are considered highly subordinating, reveals that what determines the informational status of the subordinate clauses in question is not the syntactic parameter (main vs subordinate), but their sentence final position, all other things being equal. (see also Giora, 1981a). Specifically, it turns out that syntactic subordination, which is the result of the use of explicit semantic connectors, is informationally subordinate only in sentence initial position. In sentence final position, syntactically subordinate clauses may have a foreground (i.e. dominant, to cite Erteschik-Shir and Lappin, 1979) reading.

Below, use is made of the 'question'-test and the 'lie'-test, following Erteschik-Shir and Lappin,[2] as indicative of the dominant (foreground) section of the sentence. The section constituting the foreground of the sentence is that part which either provides an answer to a given question, or is negated by a given negative response. What emerges is that, given the alternative of occupying either an initial or a final position, a given subordinate clause will have a background reading in initial position and a foreground interpretation in final position. Consider, for instance, the class of temporal adverbials: These are of highly subordinative effect, and hence, (given unmarked intonation), they cannot be assigned foreground interpretation in sentence initial position. Consider, for instance, sentence (2) in which the adverbial clause is not deniable in initial position, suggesting that it cannot be interpreted as dominant:

(2)   a: When the window shattered, Ruth was playing the piano.
      b: That is a lie, she wasn't (she was having a bath).
      c: *That is a lie, it didn't.[3]

Compare (2) to (2.1) in which the subordinate clause is at the end of the sentence:

(2.1)   a: Ruth was playing the piano when (all of a sudden) the window shattered.
       b: which is a lie, she wasn't, (she was writing a letter).
       c: which is a lie, it didn't, (it simply opened noisily)

(2.1b–c) show that both the matrix and the subordinate clause can be

assigned dominant interpretation, while (2c) attests to the fact that a subordinate clause cannot have a foreground reading in sentence initial position. Note, too, the inacceptability of a foreground marker ('all of a sudden') in initial subordination:[4]

(2.1.1)   *When all of a sudden the window shattered, Ruth was playing the piano

This can be shown to hold true of all kinds of subordination, by applying similar tests to various other kinds of subordinate clauses in both final and initial position. Consider, for instance, the clauses of temporal-spatial adverbs (3–9), comparatives (10), causals (11) and conditionals (12):

(3.)   a: While the moon did what she could to help them, they worked their way up the stream.
       b: *which is a lie, she didn't (she hindered them).
       c: which is a lie, they didn't (they worked their way down the stream).

(3.1) a: They worked their way up the stream while the moon did what she could to help them.
       b: which is a lie, they didn't.
       c: which is a lie, she didn't.

When did she think it over?

(4.)   *Before/After she made her next remark she thought it over.

(4.1) 'She thought it over before she made her next remark.' (Lewis Carrol 1865; 1966: 128)

When did the telephone ring?

(5.)   *As soon as she came home the telephone rang.
(5.1) The telephone rang as soon as she came home.

How long are you staying here?

(6.)   *As long as you wish I am staying here.
(6.1) I am staying here as long as you wish.

How long have you been here?

(7.)   *Since January I have been here.
(7.1) I have been here since January.

How long are you staying here?

(8.)   *Till the cows come home I am staying here.
(8.1) I am staying here till the cows come home.

Where are you meeting tonight?

(9.)   *The same place we met last week we are meeting tonight.
(9.1) We are meeting tonight the same place we met last week.

What does the boat sail like?

(10.) *As the water flows the boat sails.
(10.1) The boat sails as the water flows.

Why are you angry with her?

(11.) *Because she came home late I am angry with her.
(11.1) I was angry with her because she came home late.

On what condition will you go out with her?

(12.) *If she pays for the meal I will go out with her.
(12.1) I'll go out with her if she pays for the meal.

All the second sentences of the pairs present dominant subordinate clauses in sentence final position. This suggests that, all other things being equal, sentence final, unlike sentence initial position outweighs subordination with respect to information status. Thus, subordinate clauses in final, but not in initial, position can have a foreground reading.[5]

3.2. *Presenting new discourse topics by means of semantic connectors*

We have seen that subordinate clauses can have a dominant reading in sentence final position. Various texts make use of such strings to introduce new topics to the text, following the principle of presenting new information in a dominant/rhematic position so as to make it the theme/topic expression of the following utterance.

This section examines examples of different texts which employ such a device, with new discourse topics being presented in sentence final position by means of an explicit semantic connector. Consider, for instance, how new topics are linked by sentence final when-clauses in *Alice in Wonderland* by Lewis Carrol (1865: 24, 78, 139):

(13)   So she was considering in her mind . . . whether the pleasure of making a daisy chain would be worth the trouble . . . *when a white rabbit with pink eyes ran close to her.*

In the following sentences, the rabbit turns into the topic of the discourse:

(14)   There was nothing so very remarkable about *that*; nor did Alice think it so very much out of the way to hear *the Rabbit* say to itself . . . but when *the Rabbit* actually took a watch . . .

Various other discourse topics are similarly presented:

(15)   . . . For a minute or two she stood looking at the house and wondering what to do next, *when* suddenly *a footman* in livery came running out of the wood — (she considered *him* to be a footman because . . .)

(16)   The turtle had just begun to to repeat it, *when a cry of 'the trial*'s beginning' was heard . . .

This is followed by discussing the trial:

(17)   What *trial* is it? Alice panted as she ran . . .

As a poetic example, consider Wallace Stevens' use of a sentence final as-clause (1955: 12):

(18)   While the wind still whistles
        As killdeer do

when *they* rise
At the red turban
Of the boatman.

Poetry as well as prose makes use of final dominant subordination to concatenate new information to the discourse.

3.3.   *Topicalized sentences with VS order introduce discourse topic to the discourse*

In a previous study (Giora, 1981a), I discuss certain functions of topicalized sentences with VS order. I argue there that topicalized sentences with VS order transfer background material to sentence initial position, while foreground material (subjects in particular) is transferred to sentence final position via a VS transformation (see 19 below). These operations accord with the principle of old/given — first, new/foreground — last. Such an ordering of constituents is the only one possible when the topicalized constituent is a prepositional phrase (PP), when the verb — presentative or stative — presents new information to the discourse, and when the grammatical subject is not a personal pronoun (which cannot be considered new), (see 20 below).

The following are examples which exhibit new/future topic presentations to the text via VS order in topicalized sentences. Those subjects which constitute new information turn into the topics of the next sentences in which the order is SV. These examples demonstrate how the rheme (foreground) section of sentence (n) turns into the theme of sentence (n+1), concatenating themes along the lines suggested by Daneš (1974):

(19)   Where the women were was *an avenue of trees*. And *the trees* leant forward . . .

(20)   . . . where she stood stood *a shadow* under the moon. He took *its* hand and *they* ran away. (Dylan Thomas, 1963, *The Mouse and the Woman*)

These are instances of concatenation of new information at the sentence level. Their underlying principle is manifested in the presentation of new information in a foreground position. Subsequently, this foreground material is taken up as the topic of the next utterance, usually in initial position. Such linear

organization of topics guarantees linear cohesiveness of paired sentences, as suggested by Reinhart (1980).

Below, I examine another set of devices for the concatenation of new discourse topics, described along the lines suggested by Daneš (Section 2): the introduction of foreground material in a given segment-foreground-position so as to turn it into (one of) the discourse topics of the next segment. The segments vary from the line unit to the chapter unit.

4.   Segmentation and the concatenation of new topics

Segmentation at the various levels of the text – at the level of the line, the sentence, the paragraph, the chapter and the text as a whole – can affect foreground-background relations in a given segment. Note how the segmentation of a poem into stanzas (21) makes it possible to introduce new material in the final-foreground position:

(21)   *The Load of Sugar Cane*

1   The going of the glade boat
2   Is like water flowing,

3   Like water flowing
4   Through the green saw grass
5   Under the rainbows

6   Under the rainbows
7   That are like birds,
8   Turning, bedizened

9   While the wind still whistles,
10   As kildeer do

11   when they rise
12   At the red turban
13   Of the boatman.

Lines 1-2; 3-5; 6-8; 9-10; 11-13; constitute the formal segments of the poem in terms of stanzas. Given the 'lie'-test, it is possible to negate the final sections of the various segments, namely, lines 2, 5, 8, 10, 13, (all other things being equal), only in relation to the section that precedes them. The negation of the final section of the segment brings out its *ad hoc* foreground status. When applied to the following segment, the 'lie'-test will no longer mark the previous final section as foreground.[6] Line 2 for instance, can be negated only when it functions as the final section of 1-2:

(22)   a: 1   'The going of the glade boat'
           2   'Is like water flowing'

       b: which is a lie, it isn't.

Being a non-final part of another (construed) segment (1-5), it cannot be negated:

(23)   a: 1   'The going of the glade boat'
           2   'Is like water flowing'
                (. . .)
           4   'Through the green saw grass'
           5   'Under the rainbows'

       b: ?which is a lie, it isn't like water flowing (it's like a bird flying)
       c: which is a lie, not under the rainbows but under the bridges.

In the same way, it is impossible to negate line 5 or 7 in segment 1-8. It turns out that a decision as to the boundaries of a segment is a decision at the level of background-foreground interrelations. Thus, the final segment of the whole text will tend to present the most foregrounded material (Giora, 1979), and the final sections of the internal segments will be foregrounded *ad hoc*.

To support this claim with empirical evidence, I have conducted two experiments, of which I report elsewhere (Giora, in prep.). For the purpose of this paper, I shall present them here in summary:[7]

Experiment 1

Purpose: This experiment is to demonstrate that segment/paragraph final position is the natural/preferable position for dominant/foreground information.

Method: Subjects were presented with a set of two, almost identical narrative passages, differing only in the order of the sentences: in one (24a below) the final sentence conveys relatively dominant information. In the other (24b below) that information is located in an earlier position which does not disrupt the plausible presentation of the narrative events. Subjects were asked to mark the preferable order of constituents. They were instructed to follow their intuitions.

Results: 85% of the subjects interviewed marked as preferable, the passage in which dominant/foreground information occupies final position.

Conclusions: The position preferably more suitable for dominant information is segment final. This explains the high degree of correlation found (see Sections 4.1–4.4) between dominant/rhematic information and segment final position.

(24a)   There are dark days in London when the city is swept by stale darkness . . . and nobody dares leave his place . . . and just on such a day a man was urgently called up to attend to his sick son in a far away hospital at the end of the city. The man opened the door and stepped outside into the dark to look for help. But there was nobody there. Suddenly, a strange hand lay on his shoulder, and a man whose face was hidden by the dark night said to him: I shall lead you. And indeed, the stranger led the man from one end of the city to the other, unhesitatingly. Only here and there he confidently remarked: here to the left. Mind the steps. Watch the slope. When finally they arrived at the hospital the father asked: how can you manage in the dark. The darkness and the fog don't touch me, said the stranger, because I am blind. (Adapted from *Amos Oz*).

(24b)   There are dark days in London when the city is swept by stale darkness . . . and nobody dares leave his place . . . and just on such a night a man was urgently called up to attend to his sick son in a far away hospital at the end of the city. The man opened the door and stepped outside into the dark to look for help. But there was nobody there. Suddenly, a strange hand lay on his shoulder and a man, whose face was hidden by the dark night said to him: I shall lead you. The father asked him: how can you manage in the dark. The darkness and the fog don't touch me, said the stranger, because I am blind. And indeed, the stranger led the man from one end of the city to the other, unhesitatingly. Only here and there he confidently remarked: here to the left. Mind the steps. Watch the slope, until they arrived at the hospital.

Experiment 2

Purpose: This experiment is purported to demonstrate that paragraph final position is a parameter determining dominance, all other things being equal.

Method: Subjects were presented with a set of four passages (24e-f below) and were asked about their preferences as to the more natural paragraph sequence. The first pair of the set, 24c and 24d, are identical in every respect apart from the order of the last two sentences of the first paragraph in each. Both the discourse topics of the second paragraph contain information A, but

in one, (24c), the first paragraph ends with information A (immediately preceded by information B), while in the second, (24d), the first paragraph ends with information B (immediately preceded by information A), In the second pair (24e-f), the reverse order is presented. The second paragraph in each of the passages discusses information B as its discourse topic, while in one passage (24f), the first paragraph ends with information B, and in the other one, (24e), it ends with information A. The test is designed so as to check also the consistency of the participants. The participants were divided into two groups, one of which was asked to start with the first pair, and proceed with the second. The other group was required to start with the second pair and proceed with the first. Structurally, the experiment follows the model for dominance set by Erteschik-Shir and Lappin (1979). A constituent is considered dominant if it can become a subject for further discussion.

Results: 81.5% preferred the passages in which the second paragraph discusses the information which terminates the first paragraph.

Conclusions: The position preferable for a newly introduced future discourse topic is segment final. By locating information at paragraph final position, the speaker points out to his hearer/reader the discourse topic he has selected for further discussion. Information which becomes the discourse topic of the next utterance, or which can become one, is considered dominant.

(24c)   The medical signification of headaches is not easy to define. These aches can be an indication of some disease, or a meaningless reaction to daily troubles. Out of all those who apply for medical consultation reporting of headaches, some suffer from diseases whose symtom is a headache. Some suffer from headaches whose cause is migraine.

The term 'migraine' indicates a phenomenon of repetitive fits of headache, located mostly in one side of the head which begin at an early age and decrease in the course of time . . .

(24d)   The medical signification of headaches is not easy to define. These aches can be an indication of some disease, or a meaningless reaction to daily troubles. Out of all those who apply for medical consultation reporting of headaches, some suffer from headaches whose cause is migraine. Some suffer from diseases whose symptom is a headache.

The term 'migraine' indicates a phenomenon of repetitive fits of headache, located mostly in one side of the head, which begin at an early age and decrease in the course of time . . .

(24e)   The medical signification of headaches is not easy to define. These aches can be an indication of some disease, or a meaningless reaction to daily troubles. Out of all those who apply for medical consultation reporting of headaches, some suffer from diseases whose symptom is a headache. Some suffer from headaches whose cause is migraine.

Among the diseases which can cause headaches there are general diseases, infections of the tissues inside the skull, eye diseases, etc . . .

(24f)   The medical signification of headaches is not easy to define. These aches can be an indication of some disease, or a meaningless reaction to daily troubles. Out of all those who apply for medical consultation reporting of headaches, some suffer from headaches whose cause is migraine. Some suffer from diseases whose symptom is a headache.

Among the diseases which can cause headache there are general diseases, infections of the tissues inside the skull, eye diseases, etc . . .

In two different ways, the experiments demonstrate that a decision on segmentation is a decision on the level of information structure. The element which becomes final as a result of segmentation gains in informational status and becomes dominant. Alternatively, segment final position seems to be the position suitable for semantically determined dominant/foreground information. It is now borne out that a paragraph final position is, by itself, a parameter for dominance.

4.1.   *Segmentation at the line level or simultaneous rheme-theme construction*

As has been shown in Section (2), the thematic progression in the text is manifested through repetition: the topic of segment (n+1), a sentence in fact, is a repetition of information already introduced in the rhematic section of the previous utterance (n). Another device for introducing new topics into the discourse is via rhemes that are not to be taken up as the following themes, but that concurrently constitute the discourse topic of the subsequent segments. Such a device seems peculiar to poetry, in which decisions as to the length or segmentability of the line results in creating hierarchies of informativeness. Such segmentation does not apply to prose, the most elementary unit of which is the sentence (or the utterance), and not the line, which in prose is established arbitrarily (for technical reasons) rather than constituting a deliberate 'segment of text'.

In order to examine the poetic options for creating informational hierarchies by means of segmentation, consider again Wallace Stevens' poem *The Load of Sugar Cane*, repeated here in (25):

(25)   1   The going of the glade boat
     2   Is like water flowing
     4   Through the green saw grass
     6   Under the rainbows
     7   That are like *birds*,
     8   Turning, bedizened,

The segmentation of line 7 results in enjambment which allows the 'birds' to be read once as the rheme of line 7 (which is read as a complete sentence *ad hoc*) and once as the topic of the following line 8, when read to the end.

The poem *Domination of Black* by Wallace Stevens (1955: 9) (26 below) operates almost entirely along these lines:

(27)   At night by the fire
     The colors of the bushes
     And of *the fallen leaves*
     Repeating themselves,
     Turned in the room . . .
     Was it a cry against the twilight
     Or against the *leaves themselves*
     Turning in the wind
     Turning as *the flames*
     Turned in the fire
     Turning as *the tails of the peacocks*
     Turned in *the loud fire*
     Loud as the hemlocks
     Full of the cry of the peacocks

True, not all the topics are entirely new; some have already been mentioned in the first stanza. But this belongs in the thematization of the poem which represents a universe repeating itself. As for segmentation, breaking up the line at such points allows for rhematic NPs to be concurrently interpreted as themes.

Segmentation which results in simultaneous rheme-theme is not peculiar to relative clauses only. Consider *Peter Quince at the Clavier* by Wallace Stevens (1955: 89) in which breaking up the line after 'the refrain' makes it possible for it to be interpreted simultaneously as rheme-theme:

(27)   And as they whisper, *the refrain*
       Was like a willow swept by rain.

At this stage, it is possible to formulate the notion of 'pragmatic enjambment' as a device for making the rheme of segment (n) the concurrent topic of the next segment (n+1).

4.2.   *Concatenation of topics via concurrent rhemes in prose*

The technique of introducing new topics to the discourse via concurrent rhemes has been treated as a device peculiar to poetry. It seems to be the result of the deliberate segmentability of the line unit. A similar technique can, however, be employed in prose through manipulating segmentation of a different kind. An example may be found in an experimental Hebrew novel, *Past Continuous* (1977), by Yaakov Shabtai. The text exhibits no formal segmentation. The alleged processing of rheme as a concurrent theme can be viewed as one of the devices of topic concatenation that occurs in a formally non-segmented text.

Unlike the line segment in poetry, the minimal prose unit is the sentence. It follows then that enjambent of any kind is non-existent in prose which lacks formal sentence segmenting devices (unless the formal segments such as paragraphs or chapters are employed for purposes of segmenting the sentence). The question is whether there are other devices, apart from the formal ones, which allow for enjambment, and which make pragmatic enjambment possible in prose as well.

In his novel, Yaakov Shabtai makes use of semantic units — the foreground and the background sections of the narrative — to 'segment' the 'sentence'. The passage from one event unit to another is carried out at the sentence level. Shabtai introduces a new discourse topic via a relative clause which is developed into an entirely independent and autonomous narrative segment. Subsequently, the rheme of segment (n) (either background or foreground) is concurrently the topic of the following segment (n+1) (either background or foreground, respectively). 'Cezar', for instance, in example (28), functions as the rheme in a background segment, and as the concurrent topic of the following foreground segment:

(28)   But he didn't tell it to anyone, certainly not to *Cezar* who entered the next room ... (p.11)

Similarly, 'Eliezra', functions simultaneously as both the rheme of a background semantic segment and the topic of the next foreground semantic segment:

(29)   Thila did it quietly, without uttering a word, by her devotion and patience, while *Eliezra*, who at that moment got out of the house and immediately went up the road in the direction of the sea, presented her demands explicitly and in a decisive and unambiguous manner which left no room for misunderstanding and sorts of manoeuvers and evasions ... (p.43)

In the same way the 'cinema' is the rheme–theme constituent of the respective foreground–background segments:

(30)   And he looked out of the dusty bus window at the shops and the passersby, and at *the cinema* where, as a boy he used to go ... (p.13)

With Shabtai it seems a consistent technique for presenting a new topic concurrently as a rheme constituent. Consider, finally, another example in which a foreground semantic unit appears in a relative clause:

(31)   ... disappeared because of the new buildings and *the elegant streets* that were put up at high speed and in one of which the bus was running by and nearing its final stop. (p.15)

In the novel *Past Continuous*, relative clauses serve as a unique device for the concatenation of sentences and new discourse-topics. The head NP of the relative clause is, as a rule, the topic of the relative clause. But Shabtai has developed the relative clause into an independent unit, in fact, into a whole semantic segment (either foreground or background events). Consequently, sentences and new topics are introduced via relative clauses. When such a unique device is employed throughout the text, the resultant effect is that of pragmatic enjambment. The rheme of a given segment, positioned in the matrix of the final section of that segment, is simultaneously read as the topic of the following segment.

It follows that pragmatic enjambment, manipulated to structure informa-

tion, is not typical of poetry alone. Shabtai uses this technique in prose since his text lacks any formal segmentation. Even though this technique for creating segmentation at the narrative level can be used in any text, including ones which are formally segmented, its application to a formally non-segmented text seems a remarkable solution to the introduction of new topics in segment final position. Instead of making use of a formal segments boundary, Shabtai utilizes the episode boundary at the semantic level.

4.3.   *Introducing a new topic in a paragraph/stanza final position*

When it is necessary to shift a (discourse) topic and begin a new text segment (either a paragraph or stanza) the text may employ a device which is used at the sentence level. In this section, I will demonstrate the presentation of new discourse topics in paragraph final position, taken as the rhematic section of a given discourse topic segment. Subsequently, the following segment deals with the self-same discourse topic already introduced in the immediately preceding one. Its repetitive recurrence, however, serves as a cohesive device.

This is another variation on the model of cohesiveness suggested by Daneš (Section 1) differing only in that it extends beyond the sentence limits and utilizes the paragraph/stanza boundaries. Concatenation of new themes via segment final position is clearly illustrated by Wallace Stevens' poem (32 below) repeated here for convenience:

(32)   *The Load of Sugar Cane*[8]
   The going of the glade boat   = T1
   Is like water flowing   = R1

   Like water flowing   = T2 (=R1)
   Through the green saw grass
   Under the rainbows   = R2

   Under the rainbows   = T3 (=R2)
   That are like birds . . .

Concatenation of discourse topics in segment final position is prevalent in prose too. Consider, for instance, the following extracts from Dylan Thomas (1963: 62; 39) which exhibit the introduction of new themes at the end of paragraphs:

(33)   Standing alone under a railway arch . . . I was looking at the miles of sands . . . , *when two young men* joined me . . .

These 'two young men' turn into the discourse topics of the following paragraph:

(34)   *One* had a pleasant face . . . *The other man* had a boxer nose.
                                        (*Just Like Little Dogs*)

Similarly, the new topic of the following example (35 below), i.e. the 'strange boy' is the discourse topic of the segment next in turn (36 below). Note that it is first presented in paragraph final position:

(35)   I was standing at the end of the lower playground and annoying Mr. Samuels, who lived in the house just below the high railings. Mr. Samuels complained once a week that boys from the school threw apples and stones through his bedroom window. He sat in a deck chair in a small square of trim garden and tried to read the newspaper. I was only a few yards from him. I was staring him out. He pretended not to notice me, but I knew he knew I was standing there rudely and quietly. Every now and then he peeped at me from behind his newspaper, saw me still and serious and alone, with my eyes on his. As soon as he lost his temper, I was going to go home. Already I was late for dinner. I had almost beaten him, the newspaper was trembling, he was breathing heavily, *when a strange boy*, whom I had not heard approach, *pushed me down the bank*.

(36)   I threw a stone at *his face. He* took off his spectacles, put them in his coat pocket . . . and attacked.
                                        (*The Fight*)

We have seen (in Section 4) that a decision on segmentation is, *inter alia*, a decision at the level of informational relations; segmentation may affect the foregrounding of a narrative segment which is made final as a result of splitting a narrative unit into smaller segments. Breaking up a semantic unit after the introduction of a new discourse topic cannot be viewed as a cohesive device only, but also as an operation which is designed to locate the newly introduced discourse topic in a prominent (foreground) position.

Consider again (35), in which it is not only the protagonist that is newly introduced but also the event, which, in itself, becomes central in the follow-

ing paragraph (36). Embedding the beginning of a narrative unit (the fight event) at the final section of a formal segment, i.e. a paragraph, in order for it to be continued in the following text-segment, creates incompatibility between semantic and formal units. Such incompatiblity exists between the line segment and the sentence semantic unit in poetry, where enjambment is applied.[9] In prose, at least, such a division of a narrative unit into two formal segments serves, *prima facia*, a cohesive device: it connects the end and the beginning of two distinct formal segments.

Moreover, apart from fulfilling a cohesive function, such splitting of a semantic unit determines the informational structure of the text. A piece of information that is introduced in segment final position gains in foregrounding; introduced in (the following) segment initial position it becomes informationally downgraded.

4.4.   *Introducing new topics in a chapter final position*

A very common technique, which is likewise an extension of the principle of the rheme–theme concatenation proposed by Daneš (1974, Section 1), is the introduction to the text of future topics in a chapter final position. These potential topics are then taken up for further elaboration in the chapter that follows. To demonstrate the indistinguishable distribution of such a device, I have chosen three altogether different novels which consistently illustrate deployment of such topic progression. In each of the following – *Alice in Wonderland* by Lewis Carrol (1865), *Madame Bovary* by Flaubert (1857) and *Feathers* by Haim Beer (1979) – the discourse topic of chapter (n+1) is introduced at the end of chapter (n).

In *Alice*, such technique seems to structure informational relations: A chapter is segmented immediately after a surprising or a provocative piece of information is presented. This new information develops into a whole adventure in the next chapter.

In *Madame Bovary*, an enticing piece of information is likewise introduced at the end of each chapter. This, in fact, is motivated by the dynamism of the plot: each chapter ends with a highly promising event, one which raises Emma's expectations, while the following chapter deals with Emm's disillusionment. These paired sequences of expectation and disillusion recur consistently in those chapters (1–10) which focus on Emma's state of mind and personality.

In *Feathers*, concatenation of new topics in chapter final position is not

elaborated upon in order to sustain the text continuum; the thematic progression is not used to develop narrative sequences temporally ordered. Nevertheless, even in narratives that progress associatively, segmenting a text unit immediately after the introduction of a new discourse topic results in effecting the informational status of that constitutent.

Consider first, two examples out of *Alice*: Chapter Three *ends with* a little pattering of footsteps:

(37)   In a little while, however, she heard *a little pattering of footsteps* in the distance and she looked up eagerly, half hoping that the Mouse had changed his mind, and was coming back to finish his story. (p.51)

Chapter Four *starts with* the trotting White Rabbit:

(38)   It was the *White Rabbit, trotting* slowly back again . . . (p.52)

Chapter Four *ends with* a first mention of the caterpillar:

(39)   She stretched herself up on tiptoe and peeped over the edge of the mushroom, and her eyes immediately met those of *a large blue caterpillar* that was sitting on top with its arms folded, quietly smoking a long hooka, and taking not the slightest notice of her or of anything.

Chapter Five *starts with* that caterpillar:

(40)   *The Caterpillar* and Alice looked at each other for some time in silence: at last the Caterpillar took the hooka out of its mouth and addressed her in a languid sleepy voice. (p.64–65)

Segmenting a given chapter after the introduction of the discourse topic of the next chapter is functional not only as a cohesive device, but also as a poetic device; introducing a new discourse topic in a chapter final position endows it with foreground status, or rather with some dramaticality, such that is a characteristic resultant of suspense.

In *Madame Bovary* too, segmentation results in creating foreground positions. Beginning with Chapter Three, each chapter of the first part of the book ends in presenting a new theme. Chapter Three *ends with* reference to the wedding and the guests that have arrived:

(41)   Emma, eût contraire, désiré se marier a minuit, maux flambeaux; mais le pére Rouault ne comprisrien cette idée. Il y eût donc, *une noce, où vinrent quarante-trois personnes*, où l'on resta seize heures à table, qui recommença le lendemain et quelque peu les jours suivants.

Chapter Four *begins by* describing the wedding and the guests:

(42)   *Les convives* arrivèrent de bonne heur dans des voitures, carrioles à un cheval ...

Chapter Four *ends in* introducing Emma's future home:

(43)   M. et Mme Charles arrivèrent à Toste vers six heures ... La vieille boone se présenta, lui fit ses salutations, s'excusa de ce que le diner n'était pas prêt, et engagea Madame, en attendant, à prendre *connaissance de sa maison*.

Chapter Five *begins with* a detailed description of that house:

(44)   *La façade de briques* était juste a l'alignement de la rue, òu de la route plutôt derière le porte ...   .

Chapter Five *ends with* the books in which she has been reading about love:

(45)   Avant qu'elle se mariât, elle avait cru avoir de l'amour; mais le bonheur qui aurait dû résulter de cet amour n'étant pas venu... Et Emma cherchait à savoir ce que l'on entendait au juste dans la vie par les mots de félicité, de passion et d'ivresse, qui lui avait paru si beaux dans *les livres*.

Chapter Six *begins with* the books that she has read:

(46)   Elle avait *lu Paul et Virginie* et elle avait rêvé la maisonnette de bambous, le negre Domingo ...

Chapter Six *ends with* the happiness of which she has dreamt:

(47)   ... et elle pouvait s'imaginer a present que ce calme où elle vivait fût *le bonheur qu'elle avait rêvé*.

Chapter Seven *begins with* the happiest time of her life:

(48)   Elle songeait quelquefois que c'étaient là pourtant *les plus beaux jours de sa vie, la lune de miel*, comme on disait.

Chapter Seven *ends with* the invitation to Vaubyessrd:

(49)   Mais vers la fin de septembre, quelque chose d'extraordinaire tomba dans sa vie; Elle fut invitée à *la Vaubyessard* ... Ils arrivèrent à la nuit tombante, comme on commencait à allumer des lampions dans le parc, afîn d'éclairer les voitures.

Chapter Eight *begins* describing Vaubyessard:

(50)   *Le château*, de construction moderne, à l'italienne ...

Chapter Eight *ends in* introducing the cigar bag:

(51)   ... Emma, saisissant *le porte-cigares* le jeta vivement au fond de l'armoire ... Ce fut donc une occupation pour Emma que le souvenir de ce bal ... quelques détails s'en allèrent, mais *le regret lui resta*.

Chapter Nine *starts with* the same cigar bag:

(52)   Souvant, lorsque Charles était sorti, elle prendre dans l'armoire entre les plis du linge où elle l'avait laissé, *le porte-cigares* en soie verte.

Chapter Nine *ends with* Emma's pregnancy:

(53)   Quand on partit de Tostes, au mois de mars, Mme Bovary était *enceinte*.

The ends and beginnings in *Feathers* by Haiim Beer (1979) are similarly interlinked, except that here, each chapter makes up a distinct framework or develops a distinct situation. The progression within the text is thematic but not narrative. Chapters that follow each other do not provide for a temporal-spatio continuity. Continuity is nontheless maintained by the cohesive device in question here, by use of chapter final position to present the future discourse topic in a rhematic position.

Consider for instance Chapter One, which *ends in* presenting Reb David Lerer:

(54)   'What are you doing here *Reb David?*' I called out in a dream, and started to walk towards him.

Chapter Two *ends in*:

(55)   Humans whom the fear of hunger and need have driven mad and who are imprisoned in mental hospitals . . . to prevent their suicide . . .

Chapter Three *begins with* the funeral of Leder, who had committed suicide for the same reason (a fact which is recapitulated at the end of the novel). This linking operates throughout the novel.

5.   Conclusion

The fact that prior concatenation of future discourse topics can serve as a cohesive device is discussed at length in Hrushovski's analysis of the first episode of *War And Peace* (1976: 25):

One should stress that Tolstoy never introduces new semantic themes without preparation. The excitement of Anna Pavlovna has been well established in previous passages in something that could be called a semantic chain.

My approach differs in two respects. I attribute two functions to prior presentation of new information that is to be developed subsequently: a cohesive role and an informational role. As for the cohesive function of such concatenation, I have elaborated only on such phenomena as exhibit concatenation of new information in segment final position (irrespective of the nature of the segment). I have, further, shown the extent to which concatenation of new topics affects text segmentation. In this respect, I disagree with Paduceva (1974) who argues that at the beginning of each paragraph there must always be a sentence in which the initial NP is uncontrolled, i.e. unconnected by a previous mention. The examples treated in this section refute this argument altogether. Second, prior concatenation of future discourse topics suggests that the introduction of new/future themes in segment final

position is not (only or) primarily motivated by the requirement for cohesion, as has been shown, can result even when new/future topics are introduced earlier than in final position (Hrushovski, 1976). This paper is above all, an attempt to discuss the functions of text segmentation after the introduction of a new discourse topic or, alternatively, the functions of introducing future topics in segment final position. I have shown that, contrary to the general view which allows for a text to be segmented *before* the introduction of a new discourse topic (Sanford and Garrod, 1981; Longacre, 1979; Chafe, 1979), segmenting the text *after* the introduction of the new/future discourse topic is a widespread phenomenon that prevails at various levels of the text. Moreover, I have argued that segmenting the text after the introduction of the new discourse topic results in the creation of informational heirarchies. Presenting new information in segment final position endows the former with foreground status.

In sum, I have tried to go beyond Daneš (1974) in various respects: first, by showing that rheme-theme concatenation applies beyond the sentence level, and typifies connectedness at the various levels of the discourse; and, moreover, concatenation of new discourse topics motivates text segmentation in a way that creates informational heirarchies. I have shown that segment final position, of whatever nature (whether line, Sections 4, 4.1, subordinate clause, Section 3.2, stanza and paragraph, Section 4.3, chapter, Section 4.4, and semantic unit such as a narrative episode) is a parameter determining informationally foreground status.

Notes

1.   Itamar Even-Zohar has drawn my attention to similar descriptions of this cohesive device. The explanations provided, however, are only intuitively delineated. See Even-Zohar (1970).
2.   Erteschik-Shir and Lappin assign the 'lie'-test to Ross.
3.   *Indicates pragmatic incorrectness.
4.   This test has been suggested to me by Reinhart (personal communication).
5.   For a more extensive research in this direction see Giora (1981b).
6.   The application of the 'lie'-test to a stanza seems unmotivated. This, however, can be excused here as any made-up segment has the form of a sentence.
7.   The experiments were conducted in Hebrew.

8.   The present discussion does not deal with the devices used to introduce the first theme of a discourse which represents a different problem.
9.   This last remark is due to Reinhart (personal communication).

References

Chafe, W. (1979). The flow of thought and the flow of language. *Syntax and Semantics* 12: 159–181.
Daneš, F. (1974). Functions of sentence perspective and the organization of the text. In: *Papers on Functional Sentence Perspective*, F. Daneš (ed.), Prague: Academia.
van Dijk, T. (1977). Sentence topic and discourse topic. *Papers in Slavic Philology* 1: 49–61.
Ertescik-Shir, N. and Lappin, S. (1979). Dominance and the functional explanation of island phenomena. *Theoretical Linguistics* 6(1): 41–86.
Even-Zohar, I. (1970). On the research of the dialogue in the drama. *Hasifrut* 2/3. In Hebrew.
Firbas, J. (1975). On defining the thematic and non-thematic section of the sentence. *Style and Text*, 314–334.
Giora, R. (1979). A functional analysis of Wallace Stevens' poems. Unpublished paper.
– (1981). Notes towards a theory of coherence. To appear in *Poetics Today*.
– (1981a). Functions of topicalization at the sentence and discourse level. In: *Studies in Discourse Analysis*, S. Blum-Kulka, Y. Tobin and R. Nir (eds.). The Hebrew University of Jerusalem, The Center for Research in Applied Linguistics. Jerusalem: Academon. (In Hebrew).
– (1981b). Informational dominance in subordinate clause. Unpublished paper.
– (in prep) Functional Paragraph Perspective. In: *Micro and Macro Connexity of Text*, J. Petöfi (ed.). Hamburg: Buske.
Hopper, P.J. and Thompson, S.A. (1980). Transitivity in grammar and discourse. *Language* 56(2).
Hrushovski, B. (1976). Segmentation and motivation in the text continuum of the literary prose. Tel Aviv: Porter Institute, (*PPS* 5).
Longacre, R.E. (1979). The paragraph as a grammatical unit. *Syntax and Semantics* 12: 115–133.
Minski, M. (1975). A framework for presenting knowledge. In: *The Psychology of Computer Knowledge*, P.H. Winston (ed.). New York: McGraw Hill.
Paducheva, E.V. (1974 (1965)). On the paragraph structure. *Linguistics* 131: 49–58.
Reinhart. T. (1980a). Pragmatics and Linguistics: an analysis of sentence topics. In: *Philosophica*, (special issue on pragmatic theory).
– (1980b). Conditions for text coherence. *Poetics Today* 1(4): 161–180.
Sanford, A.J. and Garrod, S. (1981). *Understanding Written Language*. Chichester: Wiley.
Ziv, Y. (1975). On the relevance of content to the form-function correlation (an examination of extraposed relative clauses). *CLS* 11: 568–579.

Texts

Beer, Haiim (1979). *Feathers*. Am-Oved Publishing House. (In Hebrew).
Carrol Lewis (1966(1865)). *Alice's Adventures in Wonderland*. Harmondsworth: Penguin.
Flaubert Gustave (1857). *Madame Bovary*.
Shabtai, Yaacov (1977). *Past Continuous*. Tel Aviv: Siman Kri'a Publishers.
Stevens Wallace (1954). *Collected Poems*. New York: Alfred A. Knopf.
Thomas Dylan (1963). *Miscellany One*. London: Dent.
– (1965) *Portrait of the Artist as a Young Dog*. London: Dent.

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