Ellipsis between Connexity and Coherence

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Summary

The first two parts of the paper illustrate how a short, rather elliptical, Italian text is analysed within the framework of a theory of text reception/ production, namely Petöfi's TeSWeST.

The third part is devoted to the examination of the different kinds of ellipsis we can find in the chosen Italian text both from the point of view of TeSWeST and independently of such a theory.

The final section contains brief remarks about the goals of the analysis made in section 3 and about future development of the research.

Introduction

When we speak of ellipsis as a means of establishing connexity, we view positively what the grammatical tradition has usually marked in a negative way, speaking of ellipsis as omission, deletion or incompleteness. Even text-oriented literature continues this trend, indicating elliptical phenomena with terms such as discontinuity or disintegrity (see De Beaugrande and Dressler (1981: IV.32), Hatakeyama, Petöfi and Sözer (1984:33-34)), while other linguists dealing with texts prefer to consider ellipsis above all as one of the strongest linking devices between sentences belonging to the same text.[1]

Positive view of ellipsis or negative view of ellipsis are denominations which do not imply, of course, a value judgement: they are quick labels for different perspectives. The consideration of ellipsis as a carrier of connexity suggests as a starting point the analysis of textual environment in search of antecedents, of integrative material. Omission, deletion, discontinuity more explicitly claim a model with a continuous, complete structure where nothing is omitted or deleted.

Such different approaches do not necessarily lead to radically different observations about elliptical expressions in texts, but their difference remarkably affects the definition of the concept 'ellipsis', i.e. the variety of phenomena labelled with such a term. An overall examination of both positions seems to show that those who look for filling material in the text list fewer phenomena under the term 'ellipsis' than those who measure omissions on the basis of a complete model of the text. The latter in fact have to deal with many different kinds of omissions (lack of explicitly expressed accessibility relations, non-expressed performatives, con-textual information necessary to the understanding of the text and so on) in addition to and before any language-specific omissions present in produced texts; they are in practice led to consider elliptical every text except those canonic text representations which are constructed complete by means of the canonical language of the theory embraced.

However, as I said before, these two approaches do not necessarily lead to radically different observations about elliptical expressions, because researchers adopting a model to describe texts accept the results of language-specific investigations about all sorts of deletions in compound sentences, conjoined sentences, question-answer couplets and in paragraphs. They try to correlate the results of such investigations with the results deriving from the study of macro speech acts, presuppositions, discourse planning, etc. within the framework of a theory of text reception/production.

Considering that

1. even linguists studying ellipsis as a connexity carrier without mentioning any particular text model actually use some implicit model
2. a con-textual theory of text is required even to account for apparently simple cases of ellipsis

in the present paper ellipsis will be dealt with according to an explicitly assumed theory of text, namely Petöfi's TeSWeST.[2]

The first part of the paper will therefore illustrate how a state-of-affairs configuration is constructed to afford an acceptable interpretation of a short Italian (rather elliptical) text. This state-of-affairs configuration is kept as a reference basis in order to reveal which information is missing in the text.

The second section will deal with the division of the text into units for analysis and with the constitution of complete TeSWeST communicates.

The third section is devoted to the examination of the different kinds of ellipsis we can find in the chosen Italian text, both from the point of view of TeSWeST and independently of such a theory.

The final part contains brief remarks about the goals of the examination made in section 3. and about future development of the research.

1. Sample text and its state-of-affairs configuration

The following text is derived from a spoken text actually produced. As it appears, it is perfectly acceptable as a written text belonging to standard colloquial Italian.

(1) *Voglio andare a Roma la prossima settimana.*
I want to go to Rome (the) next week
Maria anche. Sergio forse. Giovanni non so.
Maria too Sergio perhaps Giovanni I do not know
Il resto della classe non ha ancora deciso.
The rest of the class not has yet decided

(N.B. The text is not translated in English; I have simply given a word for word correspondence between Italian and English)

A state-of-affairs configuration (2) must be assigned to the non-interpreted original text (1), in order to detect what is missing according to TeS-WeST. (2) works as an acceptable interpretation, a reference basis. This state-of-affairs (2) is informally represented below.

(2) –The utterer tells the hearer/reader that he wants to go to Rome the week after the one when he (= the utterer) is speaking.
–The utterer tells the hearer/reader that he knows that Maria wants to go to Rome the week after the one when the utterer is speaking.
–The utterer tells the hearer/reader that he does not know whether Sergio wants to go to Rome, but he suggests (through the word *forse* 'perhaps') that there is a more than 50% chance that Sergio will go.
–The utterer tells the hearer/reader that he does not know whether Giovanni wants to go to Rome.
–The utterer tells the hearer/reader that he knows the rest of the class has made no decision concerning the fact of going to Rome up till the time of utterance.
–The utterer, Maria, Sergio and Giovanni all belong to the same school class.

(For a detailed and formally represented TeSWeST interpretation of a long text, see Petöfi (1981))

2. First grade composition units and communicates

For it to be analysed, text (1) has to be divided into *first grade composition units*, i.e. into such segments marked by the text producer as independent units with the help of special signs. For written texts such signs are full stops, semicolons, question marks and equivalent punctuation marks.[3]

Text (1) presents five first grade composition units:

(1) a. *Voglio andare a Roma la prossima settimana.*
     b. *Maria anche.*
     c. *Sergio forse.*
     d. *Giovanni non so.*
     e. *Il resto della classe non ha ancora deciso.*

Since first grade composition units are often complex units from the point of view of their informational content, they have to be subdivided before being represented in TeSWeST canonical language. Petöfi calls the units deriving from the subdivision of first grade composition units *communicates*.

For particularly ambiguous texts it is possible that different interpreters give different subdivisions in communicates; it is important, however, to remark that the list of communicates has to be intersubjective. If interpreters do not agree on a single list, possible alternative lists must be clearly set out in order to check the changes provoked in the interpretation by differences in the communicate lists; see Petöfi (1981b:12-13).

Except for (1a) and (1d) in text (1) communicates coincide with first grade composition units. (1a) has to be divided into two communicates:

(1a) 1. *Voglio*
(1a) 2. *andare a Roma la prossima settimana*

Also (1d) has to be divided into two communicates:

(1d) 1. [whether] *Giovanni* [wants to go to Rome]
(1d) 2. *non so*

None of the communicates present in text (1) are complete communicates. A communicate is complete only if it contains:

a. an unambiguous description of the propositional content (the so-called descriptive proposition = P^D);
b. the accessibility relation between the utterer and the propositional content, i.e. the specification whether the utterer knows, believes, recalls,

etc. the descriptive proposition (this accessibility relation constitutes the so-called world-constitutive proposition = P^W);

c. the modality by which the utterer conveys his communication (the utterer tells, affirms, asks, etc. that P^W that P^D; this modality is called performative-modal proposition = P^{IP}).

If the analysed text does not give information about each of these three factors, the interpreter has to provide it through interpretation.

The canonical interpretation of the communicates (1a1), (1a2) and (1b) can, for instance, informally be sketched as follows:

(3)   tci   tci
      P^{IP} I tell you that   AND P^{IP} I tell you that

      tci   tci
      P^W I want P^W I know

      tci   tci
      P^D I go to Rome P^{DW} Maria wants

                                                   tci
                                                   P^D Maria goes to Rome

('tci' is an abbreviation for "it is the case that in a time x and in a place y")

The descriptive proposition in many cases is composed of stratified propositions. For instance in the canonical interpretation of (1b) there is a P^D and a P^{DW} (descriptive world-constitutive proposition). Since P^D can also be simple, not stratified, P^{DW} is not obligatory in a complete communicate: only P^{IP}, P^W, P^D with their respective tci are obligatory.

As far as concerns the AND connecting the communicates, it has the function of showing that communicates (1a1), (1a2) and (1b), once completed, are subtrees of the tree corresponding to the canonical representation of the whole text (1).

Connective links actually expressed in the text are represented at their level. In the example *Hans und Grete sind Geschwister* a connective functor links *Hans* and *Grete* creating a *connex argument* for the predicate frame. In *Mario is convinced that you tell the truth, but we are not* we have a *connex* P^W and in *Mario è a casa e Ugo?* 'Mario is at home and what about Ugo?' we face a *connex* P^{IP}.

I do not mean to go into further detail, but I think I have provided enough information about TeSWeST canonical representation of complete communicates to show that practically every verbal communication from the TeSWeST point of view is elliptical.[4]

In the title of this paper "ellipsis between connexity and coherence" is mentioned. If we define *coherence* as that special kind of connectedness which can be assigned to texts only on the basis of the background knowledge and/or respective hypotheses of the interpreters, then $P^{\mathbb{P}}$ ellipsis, P^W ellipsis or ellipsis connected with missing information in tci are types of ellipsis nearer to coherence than to connexity.[5]

According to the rules for TeSWeST canonical representation a P^D propositional kernel must contain:

the functor;

the minimal necessary number of arguments;

the minimal necessary description of the single arguments.

In a sample text such as

(4)   a. Peter flies to London.
      b. Tomorrow.
      c. In the morning.

we have three first grade composition units and three communicates. Communicate (4a) presents $P^{\mathbb{P}}$, P^W ellipsis and also tci local and temporal information is missing. Communicates (4b) and (4c) present $P^{\mathbb{P}}$, P^W, tci local information ellipsis (and (4c) also temporal information, as *in the morning* is only a specification of *tomorrow*) and lack the necessary parts of a P^D proposition kernel as well. In detail they lack the functor (*fly*), the minimal necessary number of arguments (*Peter*) and the minimal necessary description of the single arguments (case labels and reference indexes).

At least as far as concerns functor and arguments ellipsis we are back to familiar phrase deletions which are studied among connexity carriers. Assuming *connexity* as referring to the connectedness of a text which can be intersubjectively and explicitly revealed on the basis of systematic and/or conventional phonetic/syntactic/sense-semantic relationships existing among text constituents, functor and arguments ellipses are instances of ellipsis nearer to connexity.

Generally VP, NP, PP ellipses are studied only in relation to first grade composition units or rather with respect to some model of sentence with possible subordinate and coordinate sentences. In TeSWeST it appears necessary to study such ellipses starting from two perspectives, which below will be indicated simply as perspective (a) and perspective (b).

Perspective (a)

Ellipses are studied with respect to the relation between the actual communicate and its natural language context, i.e. actual surrounding first grade composition units *plus* the model of first (or further) grade composition unit proposed by the grammar chosen for each natural language.

Perspective (b)

Ellipses are studied with respect to the relation between the actual communicate and the complete communicate built up following rules for TeSWeST well-formed canonical proposition representation.

Only perspective (a) guarantees that the language specificity of ellipsis is taken in due account, while only perspective (b) allows the construction of text representations independent of language specific phenomena.

3.   Examining some ellipsis

In this section ellipses contained in text (1) will be dealt with from both perspectives, (a) and (b).

Anche and *forse* in (1b) *Maria anche* and (1c) *Sergio forse* look like proforms replacing *wants to go to Rome*, the latter conveying also doubt. If we examine their behaviour we notice, however, that they do not behave either as *sì* or *no*, or as proforms made by pronouns (as, for instance, *lo*).

Anche and *forse* can be present also when the rest of the sentence is expressed (and not deleted) and in some cases must be present.[6]

(5)   **Voglio andare a Roma e Maria.*
(6)   **Voglio andare a Roma. Maria*
(7)   *Voglio andare a Roma e/. Maria anche.*
(8)   *?Voglio andare a Roma e/. Maria vuole andare a Roma.*
(9)   *Voglio andare a Roma e/. Maria anche vuole andare a Roma.*

True proforms cannot be used in the presence of what they replace (left and right dislocations are peculiar constructions which do not confute the previous assertion). That is why it is more correct to consider *Maria anche* and *Sergio forse* simply as VP deletions or, speaking in TeSWeST terms, as partial deletions of P^D.

It remains to decide what *forse* and above all *anche* are, since they are not proforms. Let us consider the following examples:

(10)   *Voglio andare a Roma. Maria lo vuole.   Sergio è indeciso.*
  a. „ „ „ „ „ „ „ „ „ „ *Anche Maria lo vuole.* „ „ „ „ „ „ „
  b. „ „ „ „ „ „ „ „ „ „ *Maria anche lo vuole.* „ „ „ „ „ „ „
  c. „ „ „ „ „ „ „ „ „ „ *Maria lo vuole anche.* „ „ „ „ „ „ „

(11)   *Voglio andare a Roma. Maria vuole andarci. Sergio è indeciso.*
  a. „ „ „ „ „ „ „ „ „ *Anche Maria vuole andarci.* „ „ „ „ „ „
  b. „ „ „ „ „ „ „ „ „ *Maria anche vuole andarci.* „ „ „ „ „
  c. „ „ „ „ „ „ „ „ „ *Maria vuole andarci anche.* „ „ „ „ „ „

In examples (10) and (11) we have proforms *lo* which stands for *andare a Roma*[7] and proform *ci* which stands for *a Roma*. Such proforms by their presence create a textual link: *anche* is not therefore necessary, as it was, on the contrary, in (7) and very likely also in (9). If we introduce *anche*, as in (10a, b, c), or (11a, b, c), it reinforces the textual link and, according to its position, causes slight changes in the meaning. In (10c) and (11c), in final position, *anche* has in its scope the whole preceding linguistic material *Maria lo vuole, Maria vuole andarci*, while in (10a, b), and in (11a, b), its scope is ambiguous: it might stress only *Maria*.

The same can also be observed for the variant of (7)

(7)   a. *Voglio andare a Roma e/. anche Maria.*

and for (9). The variant of (9)

(9)   a. *?Voglio andare a Roma e/. Maria vuole andare a Roma anche.*

does not seem acceptable, because the signal of textual link *anche* arrives too late. (9a) is accepted by some native speakers if pronounced with a particular sentence stress.

To play its role as a textual link *anche* must be placed either before or just after the first phrase of the second sentence. Other positions further to the right are possible, but provoke changes in meaning. See for instance

(9)   b. *Voglio andare a Roma e/. Maria vuole anche andare a Roma.*
      c. *Voglio andare a Roma e/. Maria vuole andare anche a Roma.*

Example (9b) means in fact 'Maria wants to go to Rome and wants something else', but also maintains the simple meaning of (7); (9c) on the contrary means only 'Maria wants to go to Rome and somewhere else'.

From previous considerations we can draw the following conclusions:

a. *anche* is not a proform, because its presence can be (in most cases is) necessary together with repetition in order to make a text out of two sequential sentences, asyndetic or not;

b. if other proforms ensure the textual link between sequential sentences, *anche* can be omitted;

c. *anche* has the function of a textually connecting sentential adverb (= it is also the case that) in certain positions, namely before or just after the first phrase of the non-initial ser tence in a sequence of sentences;

d. *anche* can act as phrasal adverb as in (9c) and have both sentential and phrasal value as in (10a, b) and (11a, b).[8]

As far as concerns *forse*, it is a sentential adverb which can be paraphrased by 'it is probable that'; it is not a proform for the reason exposed under (a) for *anche*; it is also present when other proforms ensure textual links; when it serves as a connective having a textual linking function in elliptical sentences it must be placed after the first phrase of the second conjunct (or of the non-initial sentence of a sequence of sentences).[9]

Consider in fact the following examples:

(12)   *?Voglio andare a Roma e forse Sergio.*
    a. **Voglio andare a Roma. Forse Sergio.*
(13)   *Voglio andare a Roma e/. Sergio forse.*

Our text could have contained a first grade composition unit such as *Ugo no* or *Elena sì*. *Sì* and *no* in such an environment are true proforms for a VP. They behave as follows:

1. they cannot survive with the repetition of the VP (*Ugo no, non vuole andare a Roma* is a left dislocation);

2. they do not survive with partial VP deletion or other proforms: polarization suffices to guarantee coherence;

3. they can be placed only after the first phrase of the non-initial sentence in a sequence of sentences.

See for instance

(14) *Voglio andare a Roma e/. a Torino no.*

It must be remarked, however, that examples with polarization yes/no, even if they present an *e* 'and' on the surface, always convey an adversative value.[10] Actually you cannot have textual link between sentences with the same polarity and VP deletion:

(15) **Io voglio andare a Roma e/. Maria sì.*

Probably a lot of the preceding considerations apply only to Italian and belong to perspective (a): communicate and first grade composition unit (in

(1b) and (1c) they coincide) are seen in relation to a model of first grade composition unit for coordinate (asyndetic or not) sentences.

From perspective (b) we have to stress different points. The utterer of (1a) is the same as that of (1b); note that a change of utterer would not have consequences in perspective (a). We have to add P^{IP} and P^W; to give the information required by various tci propositions and to discover, for instance, if the time at which Maria wants to go to Rome is the same as that at which the utterer of (1a) wants to go and if they are starting from the same place. Such information can be obtained on the basis of the state-of-affairs configuration and particularly from the last assumption, i.e. that the utterer and Maria belong to the same school class.

With (1c) *Sergio forse*, from the point of view of perspective (a) the different nature of *anche* and *forse* is, in this case, neutralized and their syntactic behaviour is mostly equivalent, as we have seen. They deeply differ in meaning and this is revealed in perspective (b), where *forse* obliges the interpreter to modify the tci of P^{DW}, obtaining a canonic representation like 'I know that it is 50% probable that Sergio wants that Sergio goes to Rome'. In most cases *forse* is a modifier of tci, but for instance in

(15) a. *Dario sa l'inglese e forse il francese*

it modifies a P^D.

In the frame of TeSWeST *anche* is a predicate connector with two arguments, but for cases without partial deletion of the P^D part, such as *Prendo anche questo* or (9b, c), a solution is still to be found.

To (1c), of course, the rest of what was remarked for (1b) from perspective (b) also applies.

Let us now turn to *Giovanni non so*. From perspective (a) it can be said that (1d1) *Giovanni* is an interesting case of a topic never given or at least explicitly never given. Rather it is the only part never given of the topic 'Giovanni vuole andare a Roma'. It is a good demonstration of the truth of "l'ellipse consiste moins à supprimer qu'à isoler" as Cherchi remarks (1978: 124).

(1d) is on the surface similar to (1b) and (1c), reinforcing connexity, but differs from the previous communicates in the type of ellipsis, since *Giovanni* is not the grammatical subject of the communicate, but is only a topic for the comment *non so*. Uncertainty about punctuation — I do not think that a comma has to be placed between *Giovanni* and *non so* — confirms the peculiar status of (1d).

Maria, *Sergio* and *Giovanni* are topics derived from the hypertopic of the text. That is why we accept them even though they are never introduced as comments. We can easily delete the VP which has been present since the first sentence.

(16)   ?*Voglio andare a Roma e Giovanni non so*

The fact that in (16) coordination by *e* 'and' is less acceptable than asyndetic coordination confirms that we are in the presence of different sentence structures, not homogeneous SVO structures, which are better linked by an adversative as in

(17)   *Io voglio andare a Roma ma/. Giovanni non so.*

Such an observation suggests a comparison with examples where Givón (1983: 61-62) detects the so-called Y-movement/contrastive topicalization. The most interesting example among the ones discussed by Givón is the following one:

(18)   *I saw a boy and a girl standing there, but their mother I couldn't find.*

This example is followed (Givón 1983: 80, note 13) by the statement that "the term Y-movement is useful only when we deal with an object NP in a SVO or SOV language". In our (17) we have no such movement, therefore it is better to keep only that part of the Givón label which concerns *contrastive topicalization*, stressing, more than the counterexpectation aspect, the role that such a construction plays in the identification of the topic.

Looking for already formulated rules in the literature about ellipsis in other languages, we find in Klein's paper (1984) a rule, called E4, that is intended to work not only for coordinate sentences but also for question-answer couplets and for 'Korrekturen'.

E4:   When F (finite part of the verb, i.e. auxiliary verb, copula, modal verb or even the lexical verb) drops, every thematic element in its respective sentence may drop.

Klein gives the following example

Wer hat wem einen Kuss gegeben? Der Vater (hat) der Mutter (einen Kuss gegeben) und der Onkel (hat) der Tante (einen Kuss gegeben).

If we want to use E4 for *Giovanni non so*, we have to modify it slightly:

E4':   When F drops, every thematic not new element in its respective sentence may drop.

From perspective (b), communicate (1d2) *non so* contains an expressed P^W (*non so* in fact), while it lacks a P^D which has to be integrated through interpretation except for the argument *Giovanni*. This isolated argument constitutes a different communicate (1d1); it requires a large amount of integrative elements to reach its completeness as a well-formed communicate. Furthermore it will be signalled that it is the topic of (1d2).[11]

As far as concerns the fact that after *non so* we have neither arguments, nor P^D, let us see what is said about null complement anaphora in the observations relative to *decidere* 'to decide' below.

The last first grade composition unit (1e) does not contain any macroscopic ellipsis, but it offers the opportunity of discussing in a TeSWeST framework what in generative literature is known as NCA, null complement anaphora; see Hankamer and Sag (1976).

Expressions of canonic representations in TeSWeST always have the same structure: a functor and an argument frame. The argument frame is composed of one or more arguments provided
with   − labels indicating the role of each argument
       − indexes pointing out the argument (for instance x_1 for the utterer, x_2 for Maria and so on).[12]

Argument labels combine case grammar and valency grammar. They are attributed according to precise rules and allow grouping of functors according to their argument frames.

In (1e) the functor of P^D is the verb *decidere*: such a verb in Italian has many morphosyntactic constructions.

(19)   *Il resto della classe ha deciso di partire.*
         a. *Il resto della classe ha deciso della mia sorte.*
         b. *Il resto della classe ha deciso per la partenza.*
         c. *Il resto della classe ha deciso l'ora della partenza.*
         d. *Il resto della classe lo ha deciso a partire.*
         e. *Il resto della classse si è deciso a partire.*

One argument frame corresponds to these different constructions:

(decidere)   [cp:..., eo:...]

(N.B. cp stands for causer participant; eo for effected object. An optional ao (affected object) argument can be found, as in (19d) and (19e)).[13]

In a text if you can draw from the preceding first grade composition units forming the co-text or if you can infer from the con-text semantic or pragmatic information concerning eo, you can avoid expressing it, as actually happens in (1e). But this can happen only in a text and with verbs admitting NCA. Otherwise the sentence isolated from the text is grammatical but semantically incomplete. Let us consider as example

(20)   Paolo ha letto il libro?   Sì, lo ha letto.
                                   *Sì, ha letto.

Since *leggere* 'to read' is a verb which has two argument frames, one with cp and ao and another one with cp and nothing else, it can be used both transitively and absolutely and therefore cannot in Italian allow NCA as a textual link.[14]

NCA, though less obtrusive than the ellipses seen in (1b), (1c) and (1d), is a powerful connexity carrier and when its antecedent has to be inferred from con-text it becomes an ellipsis involving coherence factors.

Recapitulating: in perspective (a) NCA in (1e) is an ellipsis only if we adopt in our language specific grammar an argument frame for *decidere* with obligatory eo, thus considering unacceptable those uses of *decidere* with the sole cp in isolated sentences. In perspective (b) communicate (1e) is elliptical because *decidere* has in its minimal argument frame both cp and eo.

4.   Concluding remarks

Evidence of the fact that through a TeSWeST framework we can more easily detect if an ellipsis is of connexity or coherence domain has been gathered in this paper.

I have devoted more attention to perspective (a) because I think, and the previous brief discussion of some real cases ought to support my opinion, that ellipsis between sentences not coordinated and not belonging necessarily to question-answer couplets still has to receive extensive investigation.

Rules such as those Sanders (1976) or Klein (1984) propose have to be checked in every language, but first linguists working in perspective (a) have to decide whether it is convenient always to derive elliptical expressions from complete ones.[15] It might be more convenient to consider most cases of ellipsis as surface forms not derived by deletion of deeper struc-

tures. To explain ellipses, once we have abandoned the idea of the grammatically complete sentence, it is not necessary to invoke macrostructures involving the totality of the text. Connexity ellipses, above all, are dependent on immediate environment. To explain them in perspective (a), a model of sequence of first grade composition units could be enough, when the model of first grade composition unit does not suffice. That is why in enunciating perspective (a) I have spoken of model(s) of first or further grade composition units.

A lot has to be done also in perspective (b); just to mention two of the problems dealt with in this paper, let us note that it is necessary to find more and more intersubjective criteria for dividing into communicates and preparing state-of-affairs configurations. It is also important to fix the minimal number of arguments for verbal functors.

If studies in perspective (a) progress we will have an advantage for studies in perspective (b) as well, above all for all that concerns shaping effective canonic interlinguistic representations of textually well-formed sequences of sentences.

Notes

1. See, for instance, Cherchi (1978: 122) who, dealing above all with questions and answers but also with chains of declarative sentences, shows that the main difference between links created by complete utterances and links created by elliptical utterances consists in the fact that "le lien discursif établi par une ellipse est un lien nécessaire".

2. For a detailed account of TeSWeST (= *Text-Struktur-Welt-Struktur-Theorie*) see Petöfi (1981), Dorfmüller-Karpusa and Petöfi (1981) and Hatakeyama, Petöfi and Sözer (1984).

3. Modern literary texts without any punctuation and oral texts raise problems of segmentation which are not taken into consideration for the moment. In any case the process of subdivision of a text into first grade composition units should be defined intersubjectively so that a text "can be segmented by any interpreter in the same way and that the results of the analysis can be compared with each other more easily" Hatakeyama, Petöfi and Sözer (1984: 9).

4. TeSWeST is not the sole theoretical approach leading to 'ellipsomania': see, for instance, Begue (1983: 135-141) where the even more radical position of Searle is criticized.

5. Hatakeyama, Petöfi and Sözer (1984) develop this point using a more refined distinction between levels of connexity and coherence.

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6. I say that *anche* can be present also when the rest of the sentence is expressed, instead of affirming simply that it must be present, because there are cases like (8). As VP deletion in such cases is the most usual procedure, (8) is hardly acceptable as forming an autonomous text. If we think of (8) inserted in a larger context, then repetition can become a further factor of connexity and reinforce textual links. See for instance

> (8a)   *Voglio andare a Roma. Maria vuole andare a Roma.*
>   *Sergio vuole andare a Roma. Sembra proprio un pellegrinaggio!*

7. In (10) if you stop reading after the first two sentences you could interpret, as many native speakers do, *lo* as a pro-sentence (not as the pro-VP that was meant), deriving the interpretation 'Maria wants that I want to go to Rome'. To avoid such a reading I have added the third sentence *Sergio è indeciso*.

8. Colombo (1984) calls *anche* a *"connettore"*. *Connettori* are different from conjunctions in Colombo's terminology, because they involve links more with overall utterance meaning, while conjunctions involve links with some preceding linguistic entity. Examples discussed by Colombo are similar to (9c), where the hypothesis of a pro-VP function for *anche* is excluded.

9. Note that (13) is equivalent to

> (13)   a.   *Voglio andare a Roma e/. Sergio forse anche*

All the Italian speakers invited to reflect on the fact that (12) and (12a) do not work observed that these two examples only lack *anche* to be acceptable. They also remarked that in (13) *forse* alone placed after *Sergio* acts like *forse-anche*. In cases like

> (13)   b.   *Non so chi ha rotto il vetro. Sergio forse.*
>   *Forse Sergio.*

we face a different situation. It is no longer a *forse-anche* connecting two different states-of-affairs, but we find *forse* with the piece of information filling the empty variable (*who*, *what*, *when*, etc.) introduced by the interrogative sentences. Actually native speakers when asked what was the complete answer *Sergio forse/Forse Sergio* stood for, indicated the cleft sentence

> (13)   c.   *Forse è stato Sergio a rompere il vetro*

and did not suggest

> (13)   d.   *Sergio forse ha rotto il vetro.*

Conte (1982) deals with *forse* as a sentential adverb.

10. I have dealt with ellipsis deriving from a combination of *ma* 'but' and the negative pro-form *no* in Marello (1984). Italian *sì/no* with pro-sentence function are studied by Turco (1979).

11. See Petöfi (1975).

12. See Heydrich (1977) and Eikmeyer and Jansen (1980).

13. As you can see from (19) eo can be expressed in many ways. If eo is an action expressed by a verb and the optional ao is present, then the verb must be preceded by the preposition *a*: see (19d) and (19e). If ao is not expressed, then only the preposition *di* is admitted before the verb: see (19).

14.   NCA textual function is very language specific. For instance in Russian the grammatical and semantically complete answer to question in (20), *Did Paul read the book?*, is with NCA, *Yes, he read*, while the NP object pronoun is expressed only for emphatic purposes. See also Nikula (1978).

15.   The corresponding complete structure has not, in general, the same illocutionary and discoursive value. See Cherchi (1978).

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Formal Connexity and Pragmatic Cohesion in Anaphora Interpretation*

Csaba Pléh

Summary

In this paper the results of several interpretation experiments are presented, in which the relative importance of formal, syntactic factors and pragmatic relations between propositions were studied concerning the interpretation of anaphora in Hungarian. Our findings suggest that the strong formal contrast between proform usage when subjects are repeated across propositions, and when they are not, is used in interpretation. However, this can be overruled by intersentential coherence relations. A model is suggested according to which people are trying to build up a pragmatically coherent model. Formal connexity is just one of the hypotheses used in this process, although it is the strongest and most readily available one.

The study of anaphoric expressions as a means of studying coherence relations in text has a long tradition in psycholinguistics. With regard to text *production*, the classical work of Piaget (1923) has already singled out anaphoric (as contrasted to deictic) pronoun usage as an important symptom of the transformation from egocentric to sociocentric speech. Some of his contemporary critics have interpreted these changes in a "text theoretical" framework, talking about the acquisition of the means of formal coherence rather than a shift towards social perspective in speech (for a review, see Elkonin (1974)). Under different names the same issue arises again and again in contemporary research on the psychology of text production. New interpretations are given for the relatively late replacement of informal cohesion by formal connexity[1] in acquisition (Karmiloff-Smith (1980)), and specific textual disturbances are delineated where formal con-

nexity is replaced by deictic cohesion in different types of restricted communication, e.g. with certain aphasic patients (Berko-Gleason *et al.* (1980) Dressler and Pléh (1984)).

On the other hand, the problem of *understanding* of anaphoric elements and their role in comprehension is a relative newcomer in the field of psycholinguistics. In several recent models of text comprehension anaphoric elements are interpreted as specific devices which force the understander to integrate the representation of individual propositions into a coherent whole (Lesgold (1972)) or direct the search for antecedents according to the "given-new contract" (Clark and Naviland (1977)). This emphasis on the function of anaphoric proforms in the formation of a coherent text representation has gradually been supplemented by a concern over the process of understanding these very forms. Several lines of experimentation have shown that anaphora resolution requires time during discourse understanding (i.e., difficulties in identifying the antecedent slow down processing, Hirst and Brill (1980)), that contradictions between formal connexity and pragmatic cohesion provided by a mental model give the processor a hard time (Garvey, Caramazza and Yates (1974)), that pronominal coreference has a more direct access to the semantic representation of the text than repeated noun anaphora (Cloitre and Bever (1983)).

The present paper fits into this latter tradition: data will be presented on the formal determinants of anaphora interpretation in simple Hungarian sentence pairs and on the resolution of conflicts between formal connexity and pragmatic coherence during comprehension.

In Hungarian, there is a formal pattern in anaphora usage which allows for similar oppositions to the favourite one in English-centered literature — the opposition between gender agreement and pragmatic predictions (e.g. *John apologized to Mary because she has forgotten to close the door.*). In Hungarian the formal contrast is between two types of anaphorization which operate across, as well as within, sentence boundaries. Repeated subjects, as indicated by the lower coreference arrow in (1a) are deleted, while progression from the preceding object to subject role (as in (1b)) is realized in the form of the demonstrative pronoun *that.* (When it appears in neutral sentences the third person personal pronoun (indicated by the upper arrows) is usually coreferent with the other possible antecedent.)

(1)   a.   The boy noticed the man. Ø Went over to him.

b. The boy noticed the man. That went over to him.[2]

On the basis of a generative description of these phenomena (Pléh and Radics (1978)), we have tried to test the psycholinguistic implications of these "text-syntactic" regularities in proform usage. Using methods ranging from leisurely paper-and-pencil interpretation to speed reading or phoneme monitoring, we first wanted to see whether these grammatical contrasts were in fact followed in actual sentence interpretation, and whether anaphora resolution depended on additional grammatical features of the sentences (such as word order in the antecedent). In subsequent research, proform interpretation was used to test interactions between formal connexity and pragmatic cohesion. (For technical details of the experiments, see Pléh (1980, 1982, 1983); Pléh and MacWhinney, in preparation).

1. Grammatical roles and anaphora interpretation

All our studies, using different presentation and response methods, have proved that interpretation of the zero anaphora is in agreement with the grammatical model, while the interpretation of *that* as a proform is more variable. Figure 1 summarizes the results of a rather demanding task where subjects had to listen to tape recorded sentence pairs (like (1) to (4) and answer a subsequent question) e.g., *Who went over?* in the case of (l). At the same time they also had to monitor for word-initial phones specified in advance (of which the critical ones always immediately followed the anaphoric element).

Four types of antecedent case frames were used: agent-object (1), agent-commitative (2), experiencer with nominative case marking and object (3), and sentences like (3) but with the experiencer in the dative case (4). Each frame was followed both by zero and *that* proforms.

(1)   The boy noticed the man. Ø Went over to him.
        (Agent)   (Obj.)
        (nom)   (accus.)

(2)   The student met with the teacher. Ø Started to talk with him.
        (Agent)   (Commit)
        (Nom.)   (Instr.)

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(3)   The engineer remembered the boy. Ø Gave him some advice.
         (Exper.)   (Obj.)
         (Nom.)   (obl.)

(4)   The doctor pleased the actor. Ø Went over to him.
         (Obj.)   (Exper.)
   (Nom.)   (dat.)

Using case frames like (1) and (2), we wanted to see whether the inherent reciprocity in the commitative-instrumental configurations (in the terminology of Fillmore, 1977, the reciprocity of the "scene") had an influence on anaphoric interpretation. As the columns for the first two case frames indicate, in both the upper and lower part of Figure 1, there was no difference between these two types of antecedents. Case roles (nominative in both cases) i.e. the grammatical perspective in the antecedent, were more important here in controlling anaphoric interpretation than real-life scenes.

In sentence pairs like (3) and (4), the experiencer was the semantically more involved (relatively more active) participant in the antecedent. Two types of experiencer sentences were used, for the following reasons. Previous research using paper-and-pencil interpretation (Pléh (1980, 1982)) had shown that in dative-experiencer constructions the dative behaves like the nominative-agent in simple active transitive sentences. Subjects selected the sentence initial (topic position) dative-experiencer as the coreferent of zero anaphora 80 % of the time, while the corresponding figure for nominative-agents was 85 %. However, anaphora interpretation was more word-order dependent following dative-experiencer case frames than following simple active case frames. Using the formally different two experiencer frames, we wanted to see whether these effects were due to some inherent semantic properties of the experiencer category or, rather, to differences in grammatical case marking.

Comparison of the columns on the Right half of Figure 1 supports the latter alternatives. After sentences where the experiencer was in the nominative and the object in an oblique case, subjects interpreted anaphores very much as they did following sentences with a "real agent": the *zero* anaphora was interpreted as being coreferent with the antecedent noun in the nominative case, independently of word order. Following sentences with a dative-experiencer, however, the picture has changed: even in the case of *zero* anaphora, interpretation was more dependent on the word order in the antecedent sentence. If the
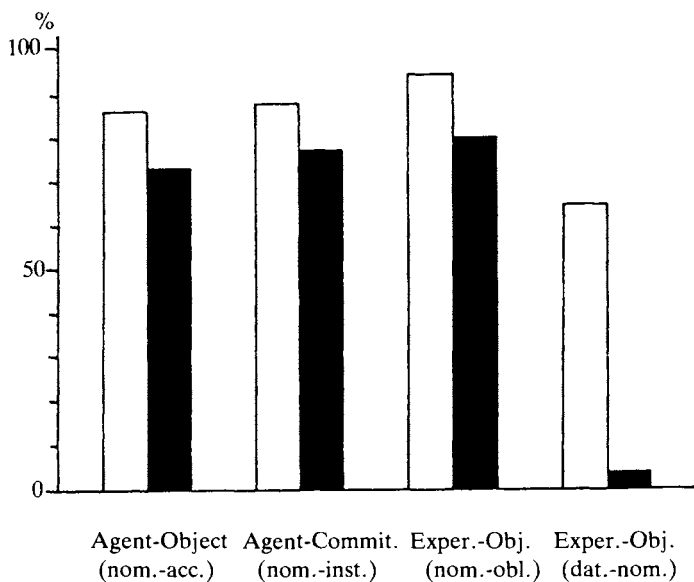
1(a): ZERO ANAPHORA
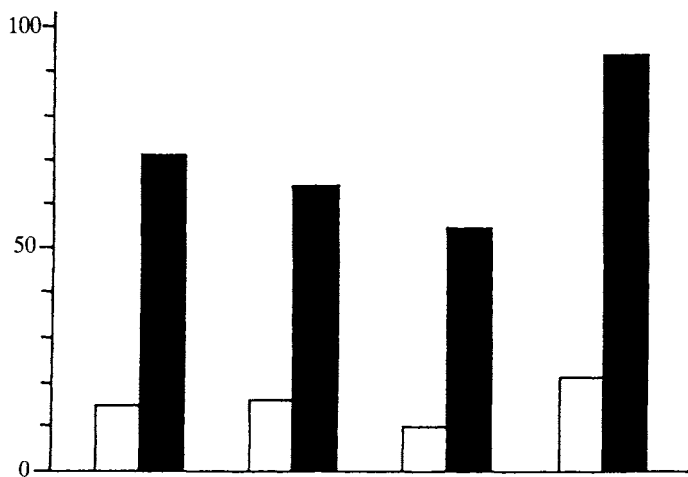
1(b): »THAT« ANAPHORA

Figure 1. Mean percentages of selecting the antecedent nominative noun as the anaphoric coreferent following two types of antecedent word orders: (i) nominative noun is topic (light columns), and (ii) nominative noun is non-topic (dark columns)

dative-experiencer was fronted (dark column), subjects selected it as the coreferent of the following *zero* anaphora 96 % of the time, while if the nominative-object was fronted, the dative-experiencer was selected as the coreferent of *zero* only 35 % of the time.

The same chart also shows that for the first three case frames anaphoric interpretation was independent of word order in the antecedent if *zero* anaphora followed (Fig.1 (a)), while it was strongly dependent on word order in the case of *that* anaphora (Fig.1 (b), compare the lighter and darker columns).

These data support, in contrast to the symmetrical grammatical model, an interpretation model which is characterized by two types of asymmetries. The first relates to the interpretation of the two different forms of anaphora. The interpretation of the *zero* anaphora in Hungarian follows, by and large, the original grammatical model: people tend to connect sequential propositions on the basis of the assumption that the subject of the second proposition remains the same as that of the first as long as there is no realized subject in it. The interpretation of the demonstrative pronoun *that* is more varied, however: linguistically naive subjects interpret it as the marked option, as a sign of change. Sometimes it is interpreted as signaling a change of subject, but mainly a change of topic. (The ambiguity is reflected in Figure 1 by the fact that the mean percentages in chart (b) are considerably closer to chance level than they are in chart (a).)

The other asymmetry relates to the antecedent case frames. Ease of anaphoric interpretation depends upon identifying the "most involved participant" (the agent or the experiencer) in the antecedent sentence. In this process, word order seems to play a decisive role. Anaphora processing is always easier when the "most involved participant" is at the same time topic in the antecedent. For the first three types (where the nominative noun is the "most involved participant") the mean phoneme monitoring times when the nominative was topic in the antecedent vs. when it was not, were as follows: 639 vs. 664; 634 vs. 654; 671 vs. 691 msec. Following dative-experiencer sentences, however, the relevant means were reversed: 636 vs. 608.

In a reading time experiment using the same sentence pairs, this proved to be true for overall processing of the sentences as well. As shown in Figure 2, in the first three case frames proforms were processed faster if the subject was also the topic, while following dative-experiencer constructions the situation was again reversed.
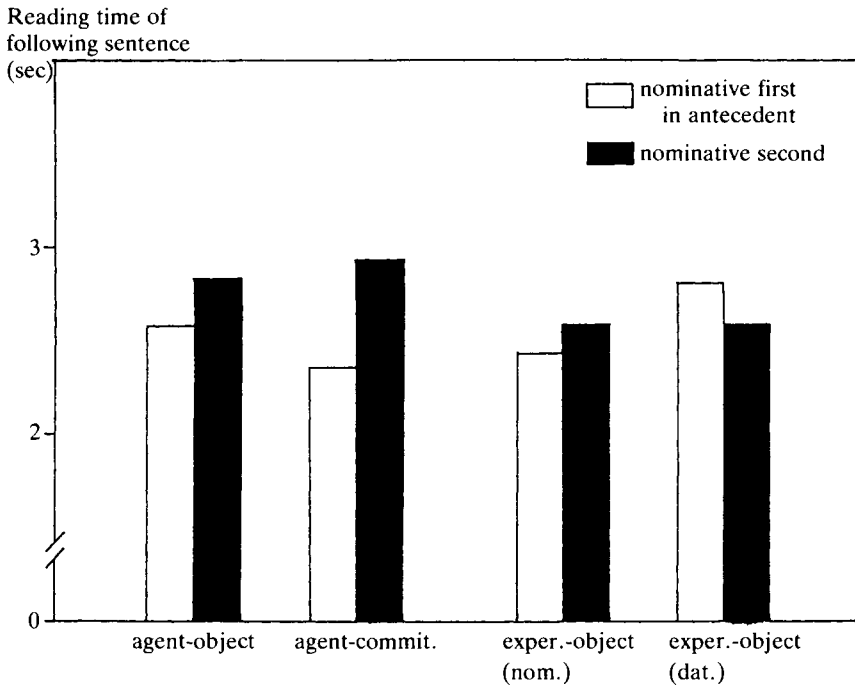
Reading time of
following sentence
(sec)

Figure 2. Mean reading times of the proform sentences following different antecedents

2. Implied causal cohesion and formal connexity

In the experiments discussed above, sentence pairs were constructed with the aim of minimizing explicit or inferred causal and other pragmatic constraints or biases towards one or the other anaphoric interpretation. The sceptic might suggest, however, that formal interpretation routines are merely a default option, that people may rely on the grammatical model only if there is nothing else to base their interpretation on. As a first attempt to address this issue more directly, we decided to check the effect of pragmatic factors in cases where the grammatical model gives no clear predictions.

a. *Pragmatic factors in three-NP antecedents*
In the paper-and-pencil interpretation experiment, antecedents with three NPs, such as (5) below, were also included. Following these sentences

only *that* anaphora was used for subject, but a third person pronoun as a non-subject argument appeared, too. This meant that the original grammatical model predicted that one of the non-subject antecedent NPs must be the subject in the second sentence, and the other pronoun should be coreferent with one of the other NPs. It was found that, within the constraints of the grammatical model, there is a tendency to associate the *that* anaphora with the more "essential" NPs in the antecedent, i.e. something like an accessibility hierarchy functions in ambiguous cases. *That* was associated with antecedent object or an obligatory oblique argument in 69 %. On the other hand, third person pronouns (like *him* in 5) were more likely to be associated with antecedent subject than with the third possible candidate (i.e. with the non-obligatory NP).

(5)　The painter went to the mason with the mechanic.
　　　That asked him for money. Who asked for the money?

(6)　The policeman went to the doctor with the patient.
　　　That has asked about his pains. Who asked about the pains?

What happens, however, if there is a pragmatic bias as in (6)?

The pragmatically biased forms were each of the type where a strong scenic expectation — hierarchy relations, professional roles, etc. — associated one of the participants with the subject role of the proform sentence. In 5 sentence tokens, interpretation was in accord with the pragmatic bias 77 % of the time. When sentence pairs of identical grammatical structure with or without pragmatic bias were compared, the pragmatically biased interpretation always won over the general accessibility strategy when there was contradiction between the two.

Thus, pragmatic factors can in ambiguous cases easily overrule statistical tendencies based on form. What happens, however, when pragmatic factors *contradict* the basic grammatical model? That was the subject of two further studies.

b.　*Interpretation based on implicit causation rather than formal connexity*

What happens if there is an implicit causal relation — or at least a possible one — between the action predicated in the antecedent and the one in the proform sentence, which might contradict the formal connexity based on the *zero-that* opposition? In order to study this, a sentence list was constructed where the verb of the second (in this case coordinate conjunct) sentence was constant (*jumped into the car*). At the same time, the *zero* vs.

that proforms in the second clause, and the nature of the verbs in the first clause, were varied. There were three verbs which do not imply an activity on the part of the patient (*pet, sniff, kiss*) and three verbs which do imply such an activity (*chase, frighten, accompany*). Word order was not varied to keep the interpretation of *that* constant.

Children had to enact the sentences with toys, while adults merely had to say who was the agent of the second verb. Disregarding the developmental data now, we have found, to our great surprise as Table 1 shows, that the only important determinant of anaphora interpretation in adults was the implied causal relation between the two events. In the case of *chase* and *frighten* it was always the patient who went to the possible hiding place. Deictic *accompany*, however, resulted in an interpretation similar to the "inactive" verbs: a strong tendency for a repeated subject interpretation was observed. In the case of *pet* and *sniff* there were some weak indications of a *zero-that* contrast.

Table 1. Mean percentages of selecting the antecedent subject as the anaphoric coreferent following different verbs in the antecedent

	pet	smell	kiss	chase	frighten	accompany
zero	80	95	95	0	5	85
that	70	75	100	5	5	90

These results suggest that anaphora interpretation is much more labile and context dependent than one would have expected on the basis of the previous data. Working with this list, for example, might have directed the subject's attention to factors of cohesion rather than connexity. This is not a trivial effect; children up to 8 years showed no signs of pragmatic sensitivity here, rather, they have used a repeated subject strategy throughout (Pléh and MacWhinney, in preparation).

This result raises the following question: in principle it is possible that when facing anaphoric proforms people first try to rely on pragmatic coherence relations between sentences; if they do find some relevance or cohesion restriction they may interpret the proform without reference to the formal connexity constraints (on the logic of this possibility see Smaby (1979)).

However, another experiment calls this interpretation into question. Here, adults had to read two-clause sentences presented clause-by-clause