

Discourse structure and concurrent processes. Some evidence from pronominal anaphora interpretation *

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The aim of this paper is to take a look at discourse structure from the standpoint of pronominal anaphora processing and so-called 'accessibility domains'. The core hypothesis of the paper is that attention-based anaphora interpretation models like Focus Theory or Centering Theory can be utilized in a more satisfying way if discourse is considered as a bundle of concurrent, interacting processes. Elaborating on this hypothesis, in the paper a central role is played by various notions borrowed from non-linear phonological frameworks.

1. Introduction

It is quite well-known and acknowledged that in discourse there is a strong correlation between the use of anaphoric expressions and the 'activation' or 'prominence' of a previously introduced discourse entity. This correlation appears most obvious in situations where two pronominal anaphors, with identical agreement features, co-occur in utterances such as the second or the third in example (1) (from Beaver 2004), where *she* is most naturally mapped onto *Jane*, and *her* onto *Mary*.

- (1) a. Jane likes Mary.
b. She often brings her flowers.
c. She chats with her for ages.

The awareness of the existence of such a correlation has given rise to many different attempts devoted to handling anaphoric preferences analogous to that exhibited by the above small discourse. Among these attempts, one of the most viable is linked to concepts like 'center' or 'focus' of attention, which shares some of the same notions of topicality (see Hajičová 1987 and Kruijff-Korbayová & Hajičová 1997 for a basic comparison), but handles them in a very concrete and operational way.

The theories developed within this attention-centered approach to anaphora grew out of Natural Language Processing, and were ini-

tially developed in order to pair an anaphoric expression to an entity already present in the so-called ‘discourse model’ – i.e., “the set of entities ‘naturally evoked’ [...] by a discourse, linked together by the relation they participate in” (Webber 1983:335) – on the basis of operations that could be implemented in a computer program.

Among these theories, the most widely-accepted and influential ones are the so-called ‘Focus Theory’ (Sidner 1979, 1981, 1983) and the ‘Centering Theory’ (Grosz et al. 1995; Walker et al. 1998; Joshi et al. 2006). Albeit very different in their ultimate goals, these two theories share some basic assumptions and mechanisms. For instance, both theories model the attentional state as dynamic. In other words, they enable the updating of the attentional state after each processing unit, thus providing a partial but verifiable hypothesis of the possible mechanisms involved in anaphora interpretation in the course of an ongoing discourse.

However, these two theories also share various non-negligible lacunae. Among them, one of the most relevant is the incapability to handle discourse entities belonging to distinct but interrelated discourse regions, as in discourses with multiple interwoven threads, or again in discourses containing quoted speech. Both Focus Theory and Centering Theory, in fact, are characterized as strict ‘local’ attentional focus theories. Therefore, in order to treat anaphors in discourses more articulated than that shown in (1), they have to work hand-in-hand with some kind of theory capable of dynamically tracking the structure of an unfolding discourse. Sidner (1979:174), for instance, acknowledges that the application of her ‘local’ algorithms related to pronominal anaphora processing may depend on the ‘global’ focus of attention (Grosz 1977), that is – roughly speaking – the attentional focus triggered by the global discourse articulation and its high level ‘conceptual discontinuities’ (Van Hoek 1995, 1997). In its turn, Centering Theory essentially adopts the same approach, assuming the existence of ‘discourse segments’ (Grosz & Sidner 1986) as the maximum domain within which to operate. It should be noted, in any case, that despite both Focus Theory and Centering Theory advocating this division of labor between ‘local’ and ‘global’ focus spaces, in the considerable amount of literature related to these two theories a lot of problems concerning the impact of discourse structure on pronominal anaphora processing still remain unaddressed, or have received partial or inadequate explanations.

In order to point out one of these problems, consider (2), a fragment extrapolated from a real example supplied in Kameyama (1998), and presented here with minor notation changes.

- (2) a. Hughes_i said Monday, 'It is the apparent intention of the Republican Party to campaign on the carcass of what they call Eisenhower Republicanism but the heart stopped beating and the life-blood congealed after Eisenhower_j retired. Now he_j's gone the Republican Party is not going to be able to sell the tattered remains to the people of the state.'
- b. Sunday he_i had added, 'We can love Eisenhower [...]'

In this example, the pronoun *he* in (2b) has as its 'sponsor' – a term which in LuperFoy's (1991, 1997) terminology in a sense subsumes what is commonly said to be the 'antecedent' of an anaphoric expression – the named entity *Hughes* in (2a). In other words, adopting the notation '(sponsor.anaphora)' to indicate the anaphoric association between two discourse entities, in (2) the pronoun *he_i* is most naturally associated with *Hughes* despite a discourse situation characterized by:

- i. The insertion, in (2a), of a long stretch of discourse (i.e., the quoted speech) between the domains containing the entities of the pair (*Hughes_i, he_i*), which co-specify with the same discourse object¹. Moreover, this takes place although the quoted speech in (2a) makes available, as a potential sponsor of *he_i*, the entity *Eisenhower*, i.e., a more recent entity than *Hughes*.
- ii. The appearance, within the quoted speech in (2a), of other pairs – e.g., (*Eisenhower_j, he_j*) – which
 - a) can not be rejected by what Cormack (1992) calls 'ratification procedure'²;
 - b) if handled on the basis of strict linear approaches to pronominal anaphora processing, may cause various interferences with respect to the (*Hughes_i, he_i*) interpretation.

To supply an explanation of the naturalness of the interpretation (*Hughes_i, he_i*) in (2), Kameyama (1998) hypothesizes that the quoted speech in (2a) – at the time that (2b) is processed – results definitively unavailable, in terms of sponsorship, for subsequent pronominal anaphors. In elaborating on this hypothesis, Kameyama resorts to the main device of the processing machinery proposed by one of the most influential theories of discourse structure, i.e., that developed by Grosz & Sidner (1986) in order to dynamically manage, inter alia, the 'global' focus of attention triggered by an unfolding discourse. Because of the elimination, on the basis of Grosz & Sidner machinery, of the quoted speech in (2a) as an available sponsorship domain, the result (*Hughes_i, he_i*) can be obtained by Kameyama in a very simple way. *He_i*, in fact, has as remaining sponsorship domain the utterance *Hughes*

said *Monday*. Therefore, since in this domain *Hughes* is the only entity that can be licensed by the ratification procedure, no problem arises with respect to the selection of *Hughes* as the sponsor of he_i .

However, it must be noted that the solution proposed by Kameyama on the basis of Grosz & Sidner's machinery – a solution independently proposed moreover by Cornish (2002) and Miltsakaki (2003) (see also Arnold 1998:74ff) – appears unable to handle discourses very similar to that shown in (2). In this regard, consider (3).

- (3) [Context: Chief Superintendent Maigret and Judge Comélieu, speaking by telephone.]
- a. Maigret_i said to Comélieu: "I have captured the robber_j in Rue de Panama".
 - b. Comélieu asked him_i: "Did you make him_j say where he has hidden the loot?"

Here, in the non-quoted speech parts, we have an association (*Maigret_i.him_i*) analogous to the (*Hughes_i.he_i*) association appearing in (2). Therefore, by assuming the presumed and irreversible non-accessibility status that Kameyama – in order to retrieve the sponsor of he_i in (2b) – attributes to quoted speech, we can arrive at the correct association (*Maigret_i.him_i*) by using, for instance, the 'local' algorithms provided by Sidner's Focus Theory. However, given the parallel elaboration of the two autonomous but interrelated discourse regions appearing in (3), Kameyama's solution could not explain the association (*robber_j.him_j*) in the quoted speeches. In fact, adopting the strategy suggested by Kameyama to arrive at (*Hughes_i.he_i*) in (2), the pronoun *him_j*, at the time that it appears in (3b), results already orphan of the domain in which its sponsor appears, i.e., the quoted speech in (3a). In other words, following the solution suggested by Kameyama for (2), in (3b) we have the pronoun *him_j* which in no way can find its proper sponsor, a fact that clearly shows how Kameyama's 'local' solution – if exclusively supported by Grosz & Sidner's machinery – results inadequate to handle complex anaphoric relations as those shown in (3).

In this paper, I propose some ideas about a possible way of processing pronominal anaphors analogous to those shown in (3). The core hypothesis of the paper is that, at least for some kind of (stretches of) discourses, focus-based anaphora interpretation models can be utilized in a more satisfying way if discourse is considered as a bundle of concurrent, interacting processes. In elaborating on this hypothesis – i.e., a very different hypothesis, as far I am aware, from those currently assumed by discourse theories aimed at formalizing discourse

structure constraints – in the paper a central role will be played by various notions borrowed from non-linear phonological frameworks.

The structure of the paper is as follows. Section 2 contains details of Grosz & Sidner's (1986) theory. Section 3 presents the basics of the formalism utilized in the paper. Section 4 gives a partial reformulation of Grosz & Sidner's theory. Section 5 introduces the notion of 'discourse layer', a simple tool utilized to express the co-presence of distinct discourse processes. Section 6 shows how a multi-layered view of discourse – by interpreting the presence of interacting, concurrent processes – may support the analysis of complex anaphoric relations as those shown in (3). Finally, section 7 presents further evidence about the usefulness of considering, as for pronominal anaphora processing, discourse as a multi-layered structure.

2. An overview of Grosz & Sidner's theory

Grosz & Sidner (1986) (hereafter G&S) claim that discourse structure is composed of three separate but interacting components: the linguistic structure, the intentional structure, and the attentional state.

The linguistic structure is the structure of the sequence of utterances which make up the discourse. It is on this level that the discourse is divided into 'discourse segments'. Evidence for a discourse segment (DS) boundary, either at the start or the end, include linguistic expressions such as cue phrases, changes in aspect, tense and/or mood, particular forms of dependent expressions, prosody and other clues.

In G&S's theory, each DS is associated with a 'discourse segment purpose' (DSP). The relationships between these DSPs make up the intentional level. There are two relationships discussed in G&S, "dominates" and "satisfaction-precedes":

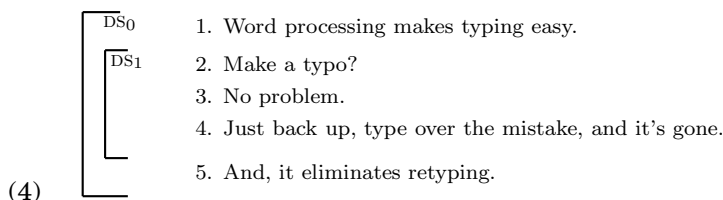
- a. DSP_i dominates DSP_j (or, conversely, DSP_j 'contributes to' DSP_i) when satisfaction of DSP_j provides partial satisfaction of DSP_i .
- b. DSP_i satisfaction-precedes DSP_j if DSP_i must be satisfied before DSP_j .

One DS can immediately precede another in a discourse without them being in a satisfaction-precedes relation. Conversely, a satisfaction-precedes relation does not require one DS to immediately follow another.

Attentional state – an abstraction of the participants' 'global' focus of attention – is modeled as a set of focus spaces. The collection of focus spaces is managed as a stack³. For each DS, a correspond-

ing focus space is pushed onto the ‘global’ focus stack with all the discourse entities which are made available for co-specification in that segment. The dominance relations in the intentional structure determine which operations are performed on the stack when a DS is processed. If DS_j is dominated by a DS_i , the corresponding focus space j can be pushed on top of focus space i if i is on top of the stack when j is pushed. The stack of focus spaces is ‘popped’ prior to insertion when DS_j contributes to DS_i , where focus space i is higher in the dominance hierarchy.

Here is an example, discussed in detail in Hirschberg & Pierrehumbert (1986) and Avesani & Vayra (1992), in which G&S’s model is utilized in order to verify the availability – in the ‘global’ focus of attention – of the potential sponsors of a dependent expression.



In (4), the boundaries of DS_1 are identified on the basis of prosodic cues such as pitch range and pause. During processing, the focus space corresponding to DS_0 is pushed onto the stack, followed – at the time that line 2 is processed – by the focus space corresponding to DS_1 , which is continuously filled while DS_1 is processed. After line 4, the focus space corresponding to DS_1 is ‘popped’, hence leaving on the stack only the focus space related to DS_0 . As a consequence, the pronoun *it* in line 5 can not co-specify with *mistake*, since the focus space associated to DS_1 has already been ‘popped’ from the stack. Therefore, in line 5, *it* has to find its sponsor in the domain of the focus space still on the stack – i.e., the entity *word processing* in DS_0 (line 1).

A basic G&S analysis of a discourse is fully adjacent (no crossing), comprehensive, unique and recursive. Therefore it forms a tree. Webber (1988, 1991), in fact, points out that what G&S call attentional state is modeled equivalently as a stack or by constraining the current discourse segment to attach on the right-most frontier of a tree-shaped discourse representation, since

- a) attaching a leaf node corresponds to pushing a new element on the stack;

- b) adjoining a node n_i to a node n_j corresponds to popping all the stack elements through the one corresponding to n_j , and pushing n_i on the stack.

Accordingly, the so-called ‘right frontier constraint’ related to tree-shaped discourse representations (see, among many others, Polanyi 1988, Di Eugenio 1989, Asher 1993, Eckert & Strube 2000, Polanyi et al. 2004) might be thought as a different way to provide what G&S realize with focus spaces and the stack, that is:

- a) an attachment constraint in the incremental development of the tree structure (see also the structure-building principles proposed by Phillips 1996, 2003);
- b) a sponsorship constraint defining the regions of the discourse taken to be in the ‘global’ focus of attention.

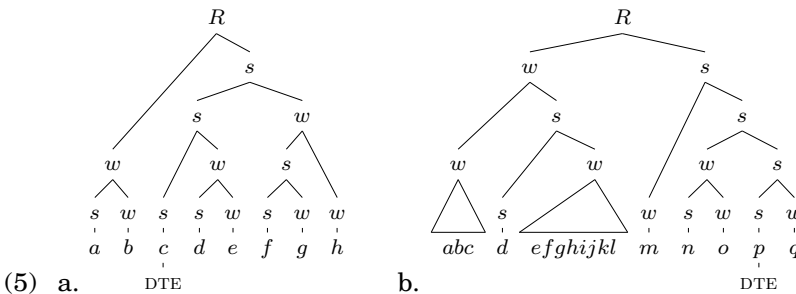
Moreover – as for pronominal anaphors – notice that the focalized material on the right frontier of a tree-shaped discourse representation is normally assumed as the recruitment domain of what I shall call here (following Hellman & Dahl 1994 terminology) “situational anaphora” – a kind of phenomenon variously labeled in the literature as ‘clausal reference’ (Di Eugenio 1989), ‘discourse deixis’ (Webber 1988, 1991), ‘reference to abstract objects’ (Asher 1993), etc.

3. Preferential trees

The tools utilized in this paper to represent sponsorship preferences among discourse entities – or among variously defined sponsorship domains embodying an arbitrary number of discourse entities – are borrowed from the framework developed by Liberman (1975) in order to formulate his theory on stress and intonation. They consist in binary branching trees of arbitrary complexity which here will be called ‘preferential trees’.

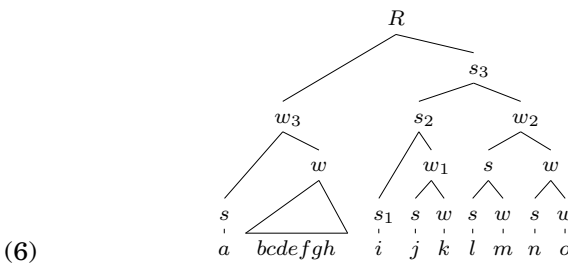
In a preferential tree – exactly as in Liberman’s ‘metrical trees’ (see also Liberman & Prince 1977) – each non terminal element is labeled by one of the following symbols: *R* (root), *w* (weak), and *s* (strong). *R* denotes the root of a tree, and therefore an undetermined node with respect to preferential values. The labels *s* and *w* indicate the relative preferential values, as for sponsorship, of two sister objects. In other terms, the material dominated by a *s* node is preferred, as for sponsorship, to what is dominated by its *w* sister node.

To read and interpret preferential trees such as those represented in (5), the concept of ‘Designated Terminal Element’ (DTE; cf. Liberman 1975:43) is of basic importance. Given a preferential tree, the DTE is the terminal element dominated by no nodes labeled *w*. Therefore, for (5a) the DTE is *c*, and for (5b) the DTE is *p*.



Let’s now assume that a pronoun *P*, provided by an incoming unit, is searching for its sponsor in the domain of a preferential tree like those shown in (5). The first potential sponsor a preferential tree offers to *P* is the discourse entity in DTE position, i.e., the most preferred entity within those dominated by *R*. However, if the ratification procedure can not approve this entity as the sponsor of *P*, the evaluation of the remaining potential sponsors is guaranteed by a ‘Reversal Rule’ (RR; cf. Liberman 1975:158ff,193ff) of the type $[x [s w]] \Rightarrow [x [w s]]$, where *x* stands for *R*, *s* or *w*.

Let’s suppose, for instance, that a pronoun *P* has to be associated with one of the terminal elements of the preferential tree shown in (6).

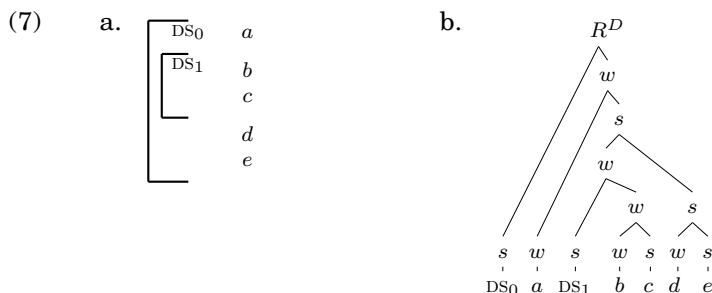


Let’s now suppose that, for the tree in (6), the discourse entity in DTE position – i.e., *i* – can not be approved by the ratification procedure as the sponsor of *P*. In this case, a RR $[s_2 [s_1 w_1]] \Rightarrow [s_2 [w_1 s_1]]$ will have the DTE role played by *j*, hence allowing for the application of the ratification procedure to the pair $(j.P)$. Moreover, analogue RRs

will allow, if needed, the evaluation of the sponsorship capabilities of all the remaining entities dominated by R .⁴

4. A transposition

Given a fragment made up of several DSS like (7a), a representation in terms of preferential trees that expresses the modeling of the attentional state effected by G&S in terms of focus spaces and of operations regarding a stack of focus spaces is shown in (7b). In (7b), the index D of R indicates that the tree is relative to a discourse D at a given processing stage.



With regard to (7b), here are some remarks regarding the nature and construction of the tree.

i. Terminal elements. In (7b), each of the terminal elements a , b , c , d and e is constituted by what I call an ‘Insertion Unit’ (U_I), i.e., an independent clause connected to its possible subordinates. Proof of the importance in processes of anaphoric interpretation of what I call U_I – that is, the unit on the basis on which it is possible to proceed to the attribution of at least part of the s/w labels on a sentential level – has been provided by several authors (e.g., Suri 1992, Cormack 1992, Azzam 1995, Kameyama 1998, Miltsakaki 2003, Poesio et al. 2004, Joshi et al. 2006). Still, in this regard, note also how Mattiessen & Thompson (1988) have treated the relations of syntactic subordination as the grammaticalization of discourse relations, i.e., relations no doubt important for the purposes of anaphora interpretation (see, among many others, Fox 1987, Berretta 1990, Cristea et al. 1998, Kehler 2002, Schlenker 2005:410ff, Wolf & Gibson 2006). But it ought to be said that the hypothesis that I assume here with regard to the constituency of U_I s derives from the analytic framework developed by Labov and associates (Labov & Waletzky 1967; Labov et al. 1968),

which is the framework employed to make a preliminary analysis of the corpus utilized to test a pronominal anaphora processing framework embodying the ideas sketched in the current paper⁵. Again, notice that the preferential trees rooted at $U_i s$ (e.g., a , b , c , d and e in (7b)) may exhibit extremely complex preferential patterns. However, since these patterns do not assume a particular relevance for the specific issues discussed here, nothing will be said about them.

ii. DSS and terminal elements. In (7b), the terminal elements DS_0 and DS_1 are no more than simple pointers to the root of the tree that immediately dominates their s/w nodes. In a tree such as (7b), the embedding relations relative to the DSS are therefore expressed in terms of dominance of the nodes; e.g., in (7b) DS_0 dominates DS_1 .

At least adopting an orthodox replica of G&S's machinery, the content of the elements labeled DS is substantially the DSP that for G&S must be a part of the corresponding focus space. Strictly speaking, such elements should therefore be labeled DS_i/DSP_i .

iii. Insertion into the tree. For trees like (7b), the insertion of the various $U_i s$ into the tree requires the insertion of at least two nodes: a) a node which acts, in the tree rooted at R^D , as a combining site; b) the effective input structure. In this regard note how the input structure can be constituted:

- a) by a single insertion unit U_i if this U_i is dominated by a DS already present in the tree;
- b) by a pair of elements $[[_s DS_i] [_w U_i]]$ if DS_i is not already present in the tree.

For the hypothetical sequence $a \dots e$ in (7a), the steps that lead to the construction of (7b) are therefore those shown in Figure 1, where the derivation follows the 'left-to-right', 'Merge Right' principles utilized by the structure-building procedure proposed by Phillips (1996, 2003).

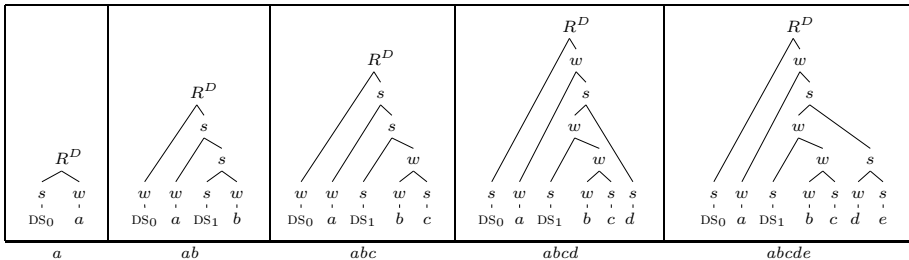


Figure 1. Tree derivation.

iv. Attribution of s/w. In trees like (7b), the *s/w* values are assigned to the various nodes in such a way that the DTE of a tree is constantly represented by the last element inserted. Exceptions to this are the DS elements, which are labeled *s* on account of their own functional value and of the mechanisms that govern the association of an incoming pronoun in search of its sponsor. However, when a DS_i is still 'open' (i.e., under construction), a $RR [sw] \Rightarrow [ws]$ applied to the preferential nodes of the DSS elements dominating DS_i and their sister nodes establishes DS_i as the insertion domain for U_i s (cf. Figure 1, where the trees which interpret the articulation of the fragments *ab* and *abc* have DS_1 as their DTE).

v. Loci of association. Within the terminal elements of a tree like (7b), the element preferred for searching a sponsor is the element which expresses the DTE of the tree. If the DTE is constituted by an element labeled DS_i (that is, an element that, on account of its own functional status, is by definition inaccessible to an association (but see fn. 6)), the application of a RR to the preference node related to DS_i and its sister node ensures that the role of DTE is taken on by the U_i that expresses the maximum prominence among those dominated by DS_i . If this U_i does not offer ratifiable sponsors for an anaphoric association, starting from this U_i further RRs can be applied. For example, given a pronoun in search of a sponsor, the first thing the tree (7b) does is to offer, as a sponsorship domain, the element DS_0 , i.e., the DTE of the tree. Given the particular status of this element, the application of a $RR [R^D [s \ w]] \Rightarrow [R^D [w \ s]]$ ensures that the DTE of the tree becomes *c*, therefore promoting this U_i to the locus of maximum preference for searching a sponsor. Should *c* not offer a ratifiable sponsor for an incoming pronoun, the application of further RRs would guarantee, in a principled way, the explorability of the entire tree.

vi. Association domains and accessibility. According to the model proposed by G&S, the discourse entities comprised in a definitively closed DS (e.g., DS_1 in (7a), at the time that *d* is processed) are entities no longer available as sponsors to incoming dependent expressions. At least assuming an orthodox replica of G&S's model, for (7b) the entire sub-tree that has as its DTE the element DS_1 ought as a consequence to be excluded from any processes of anaphoric association. In terms of preferential trees, this constraint can be achieved by coupling the RRs to a simple restriction. This restriction can be stated as follows:

Avoid attributing the DTE to an element DS_i if its corresponding s or w node is immediately dominated by a node which is not on the 'right frontier' of the tree, i.e., the path from the root of the tree to its right-most node.

For (7b), therefore, the selections of a locus of association governed by the application of possible RRS are c , d , and a . Again, given the tree that interprets in Figure 1 the articulation of the fragment abc , the selections are constituted by c , b , and (should neither c nor b offer ratifiable sponsors for a pronoun) by the material dominated by the DS that dominates DS_1 , that is a ⁶.

5. G&S's theory, interruptions, attentional state and discourse layers

In G&S's theory, the basic structuring operation is 'embed'. However, in order to treat discourse phenomena that can not be handled by this operation, G&S resort to the concept of 'interruption' (p. 192ff). An example of what G&S call 'true interruption' – characterized on the basis of one of the two meanings of interruption defined in the theory, that is the 'strong' meaning⁷ – is given in (8).

- (8) D_1 : John came by and left the groceries
 D_2 : *Stop that you kids*
 D_1 : and I put them away after he left

In (8), D_2 is analyzed by G&S as a 'true interruption' that breaks the flow of D_1 . As a consequence, "them in *and I put them away* can not refer to the children [...] but only to the groceries" (p. 194).

As for the processing of true interruptions for the purposes of defining the attentional structure, G&S model these occurrences using a stack in this case as well. Even according to G&S, however, for true interruptions the use of such a data structure is far from adequate. Here is what they write about this highly relevant problem pertaining to their stack-based model of the 'global' focus of attention:

The focusing structure for true interruptions is different from that for the normal embedding of segments, *because the focusing boundary between the interrupted discourse and the interruption is impenetrable*. (p. 193; my emphasis)

This boundary is clearly atypical of stacks. It suggests that ultimately the stack model is not quite what is needed. What structure should replace the stack remains unclear to us. (p. 204; fn. 12)

Now, among many other domains, discontinuous phenomena structurally very similar to the discourse phenomena that G&S define as true interruptions also occur in morphology, phonology and syntax, and on the basis of the classic non-linear approach to some linguistic structures they are often processed with the help of multi-dimensional representations.

In morphology, for example, a phenomenon that in many respects resembles to G&S's 'interruptions' is found in Semitic languages. Here – broadly speaking – the roots are expressed by consonants (e.g., the Arabic *k-t-b*, roughly 'to write') and the various words are formed by varying the vowels (e.g., *kataba* 'he wrote'; *kutiba* 'it was written'; *ka:tib* 'writer'; *kitab* 'book'; etc.). In the model developed by McCarthy (1981), in similar cases morphological articulation is analyzed by utilizing different planes of representation, each of which is equipped with its own principles and Well Formedness Conditions, as well as being bound one to the other by the same 'skeleton'⁸. Again, phonological theories such as Autosegmental Phonology (Goldsmith 1976, 1990) base descriptions, constraints and rules on the presumed existence of different levels or planes, bound one to the other by a skeleton. Finally, as for syntax, this type of multi-dimensional framework is utilized in various domains. Yip et al. (1987), for example, resort to it in order to analyze case assignment. Bobaljik (1999) suggests that Cinque's (1999) analysis must be recast in terms of a multi-dimensional framework. Co-ordination is often seen as involving 'parallel structures' (see, among many others, Goodall 1987). And several authors treat at least part of the so-called 'disjoint constituents' as completely autonomous constituents, expressed in multi-dimensional syntactic structures and interpretable exclusively in terms of principles concerning the articulation of the discourse. Espinal (1991), for example, supplies similar interpretations for discourse adverbials, vocatives, appositive relatives, etc.

Returning now to what G&S call true interruptions, a first hypothesis regarding their representation in terms of preferential trees could simply assume the multi-dimensional point of view that informs the morphological, phonological and syntactic representations I have just mentioned. Therefore, for an example like (8), we could assume the existence of a plane P_1 relative to D_1 , and of a plane

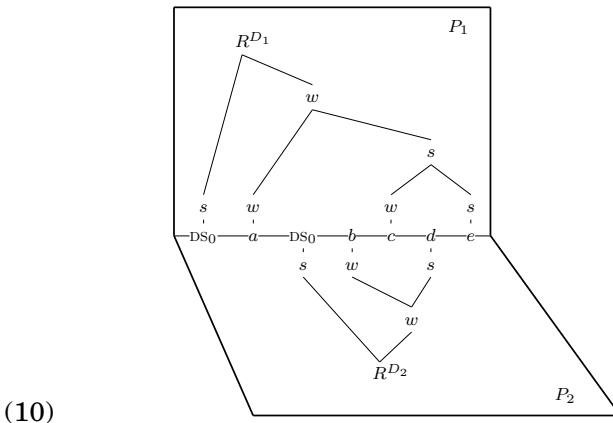
P_2 relative to D_2 , and that P_1 and P_2 are connected exclusively on the basis of the skeleton, i.e., that the terminal elements of the two trees rooted at R^{D1} and R^{D2} are correlated exclusively in terms of precedence in their linear distribution.

However, consider (9), where we find complex anaphoric relations that by virtue of the discontinuity of the sequence $a \dots c$ can not be interpreted on the basis of the ‘typical’ or ‘atypical’ discourse stack model proposed by G&S.

(9) [The example is an idealization of a fragment of a street sales talk – concerning a strange gadget for cleaning – effectively included in a text of my AESS-based corpus (cf. fn. 5). Context: S = the seller; A = the audience; W = a member of the audience; XYZ = a widely known tool for cleaning.]

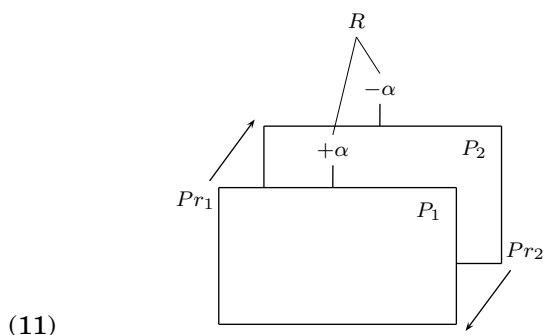
- a. (D_1) [S to A:] “blah blah_i”
- b. (D_2) [S to W:] “Madam, do you have a XYZ_j at home? It’s good... good stuff, hmm?”
- c. (D_1) [S to A:] “blah blah_i”
- d. (D_2) [S to W:] “Get it_j, madam. And shoo! Yes! Shoo! This [= the gadget for cleaning offered to the audience by the seller] is better! Wow!”
- e. (D_1) [S to A:] “blah blah_i”

For (9), we could equally assume a representation in terms of preferential trees arranged on several planes like the one shown in (10), where for the sake of convenience the utterances (9b) and (9d) are represented as single nodes in the tree rooted at R^{D2} .



Conventional, static multi-dimensional representations like (10), however, avoid assigning degrees of preference to possible n planes involved in the discourse. In other words, they do not express the fact that in correspondence with (9d) – as a consequence of various reasons: prosodic, related to the locutive path expressed by the vocative or recoverable from perceptual clues, etc. – a switch occurs regarding the selection of the plane preferred (i.e., ‘foregrounded’) for the interpretation of the pronoun it_j present in the utterance. Hence the decision to adopt – in place of standard, static representations like (10) – representations like (11), where

- a) the planes are arranged like layers in a drawing;
- b) the labels $\pm \alpha$ represent s or w according to the perspective (Pr) utilized to foreground P_1 or P_2 ; therefore, for a pronoun in P_1 we can assume P_1 as plane s for the purposes of selecting a sponsor, and P_2 as plane w ;
- c) the skeleton is constituted by the entire set of terminal elements of the trees present in P_1 and P_2 when P_1 and P_2 are superimposed one over the other, exactly like the layers in a drawing.



With regard to the proposal put forward by G&S to take account of their ‘true interruptions’, the solution shown in (11) appears far simpler and more natural. In fact, it does not make it necessary to resort to ‘atypical stacks’ with impenetrable frontiers (which in any case are not equipped to handle examples like (9)), but analyzes the interweaving of the DSS and the attentional states using layers that dynamically assume s/w values, while it expresses the effective development of the discourse by means of the skeleton.

6. Association domains, quoted speech and a principle

Let's go back to Kameyama's (1998) hypothesis concerning the discourse status of quoted speech. In this regard, reconsider (3), repeated here for convenience as (12).

- (12) [Context: Chief Superintendent Maigret and Judge Comélieau, speaking by telephone.]
- a. Maigret_i said to Comélieau: "I have captured the robber_j in Rue de Panama".
 - b. Comélieau asked him_i: "Did you make him_j say where he has hidden the loot?"

This example – at least assuming an orthodox view of the 'intentional structure' proposed by G&S's theory – illustrates a heterogeneous structure analogous to the one hypothesized by G&S for their 'true interruptions'. Consequently, in following Kameyama's (1998) line of reasoning suggesting that the quoted speech must be treated as a kind of inaccessible 'discourse segment', in order to explain how to *him_j* can co-specify with *robber* it would at least be necessary to postulate the employment of an 'atypical stack' with an impenetrable barrier. But such a move, as already seen in the introductory section, would be in any case inadequate to handle (12), and it seems far more natural to treat examples like (12) as the result of interacting, concurrent processes which display:

- a) their results on the basis of the skeleton, i.e., the effective sequence derived from the processes' interaction;
- b) their different foregrounding degrees on the basis of the *s/w* values assumed by the layers on which the processes can be represented.

On the basis of a representation like (11), for (12) it would therefore be possible to hypothesize:

- i. The presence of a layer for the locutive path that is introduced directly between the 'owner' of the whole discourse ⁹ and the recipient, that is a layer that acts as a support to 'Maigret said to Comélieau' and 'Comélieau asked him'.
- ii. The presence of a layer – connected to the preceding one by the skeleton and by the tree that dynamically defines the *s/w* values of the layers – relative to the locutive path that is introduced between the two individuals who in (12) realize a speech.

As for the assignation to the layers of the *s/w* values – necessary in order to arrive at the correct (*sponsor.pronoun*) pairs – this could be effected by making use of the following principle:

SAME LAYER PRINCIPLE (SLP). Should this be possible, identify the preferred layer for the selection of the sponsor as the same layer in which the pronoun appears.

This principle, which is substantially limited to highlight the centrality – for the purposes of pronominal anaphora interpretation – of the possible co-presence in the discourse of heterogeneous regions, and consequently of various points of situational anchoring (Fillmore 1975; Barwise & Perry 1983), defines the correct associations for (12), i.e., (*Maigret.him_i*) and (*robber.him_j*)¹⁰.

6.1 Notes about the SLP

Despite its absolute simplicity, the SLP allows a reasonable way of tackling at least a subset of pronominal interpretation issues related to the presence of quoted speech in a discourse. Consider, for instance, example (13) (from Simenon 1992:72), where one of the layers does not always appear explicitly¹¹.

- (13) [Context: in *Quai des Orfèvres*, a journalist nicknamed ‘Vicomte’ (*V_i*) and Chief Superintendent Maigret (*M_j*).]
- | | | |
|----|---|---|
| a. | [<i>V_i</i> to <i>M_j</i> :] “Non è stata ancora trovata la testa?” | “Hasn’t the head been found yet?” |
| b. | [<i>M_j</i> to <i>V_i</i> :] “No, che io sappia.” | “No, not as far as I know.” |
| c. | [<i>V_i</i> to <i>M_j</i> :] “Ho appena telefonato a Judel, che ha detto di no. Se sa qualcosa di nuovo, commissario, si ricordi di me.” | “I’ve just called Judel, who said no. If you hear anything new, Superintendent, remember me.” |
| d. | $\emptyset_{i/j}$ Andò a risedersi [...] | (<i>He_{i/j}</i>) went to retake his seat [...] |

In order to be able to properly handle \emptyset in (13d), the first step ought to be constituted by the inferential reconstruction of the part explaining, in brackets, the locutive paths involved in the example¹². In this way \emptyset could find its sponsor in the owner of the quoted speech in (13c) – i.e., the journalist nicknamed ‘Vicomte’ – disregarding whatever potential sponsor evoked in the non-bracketed region. Moreover, in confirmation of the validity of the SLP, the removal of the utterance

(13c), resulting in a discourse containing only (13a), (13b) and (13d), could only lead to the identification of Maigret as the sponsor of \emptyset .

But again, on a more general level, it is important to note that the SLP allows for the redefinition of some default preferences normally assumed for pronominal anaphora interpretation. In Italian, for instance, if a \emptyset -anaphora a) can recruit a sponsorship domain in the material on the right frontier of a discourse tree (acting in this way as a situational anaphora), and b) can co-specify with a NP, then the preferred sponsor is the NP. This point is discussed by Di Eugenio (1989) on the basis of the following example:

- (14) a. Marco è stato espulso da scuola.
 Marco was expelled from school.
 b. i. \emptyset ha reso sua madre infelice.
 He made his mother unhappy.
 ii. Questo ha reso sua madre infelice.
 This made his mother unhappy.

Here follows the relevant part of Di Eugenio's argumentation related to example (14):

\emptyset -anaphora is normally understood as referring to Marco, which is a centered entity, and not to the fact that "Marco was expelled from school"; to achieve this effect, we have to explicitly use *questo*, as in [(14b-ii)]. (Di Eugenio 1989:133-134)

Consider now the following example, from Simenon (1992:96).

- (15) [Context: in a bistrot, an employee (E_i) who works at the luggage check-room of the Gare de l'Est, Maigret, a young man (Y_j) and various other individuals. The young man is suspected of being the man who deposited a suitcase – containing important clues for Maigret's current investigation – in the luggage check-room of the railway station. Maigret asks the employee for the young man's identification.]
 a. [E_i to all:] "Ecco... A vederlo_j così, "Well... From what I can see
 direi [che è lui]_k." of him_j, I'd say [it is he]_k."
 b. [Y_j to all:] " $\emptyset_{*i/k}$ È falso" [...] " $\emptyset_{*i/k}$ is false" [...]

In order to have a chance to fully interpret (15), the first step required, as happens in (13), is the reconstruction of the basic information regarding the speakers involved and their locutive paths. Given such a reconstruction, in (15b) the \emptyset -anaphora has as its possible co-specifiers:

- a) the owner of (15a), that is the employee; in this case the resulting interpretation can be paraphrased as ‘the employee E_i is a false man’;
- b) what the employee says in (all/a part of) his speech; in this case the resulting interpretation is, broadly speaking, ‘(all/a part of) what the employee E_i says in (15a) is false’.

Now, adopting the default preference advocated by Di Eugenio with regards to contexts with no quoted speeches, in (15b) – despite that both the interpretations given above can be licensed by the ratification procedure – the sponsor of the \emptyset -anaphora would be the owner of the quoted speech, that is the employee E_i . In fact, in order to instantiate a discourse entity able to recruit its sponsorship domain starting from the quoted speech in (15a) (or better, from its bracketed indexed part), according to Di Eugenio *questo* must be used (i.e., ‘ \emptyset_i is false’ vs. ‘this_k is false’). However, in (15) the sponsor suggested by Di Eugenio’s pattern of preference, despite its full availability, is the dispreferred one. In fact, an informal test submitted to a dozen native Italian speakers had shown that in (15), for all the people involved in the test, the sponsor of \emptyset must be found *inside* the quoted speech, and not elsewhere. And this is exactly the preference predicted by the SLP application to (15).

In any case, it should be stressed that, in general terms, the SLP application is not dependent from the quoted speech *per se*, but from the accessibility constraints exhibited by the available processes which set up the overall discourse, i.e., a fact which typically appears more evident in correspondence with the asymmetries that may be caused by the insertion of quoted speech into the discourse, or that may appear when the owner of a (stretch of) discourse presents herself or himself under various ‘guises’ (e.g., when, at some point of a narrative discourse, she or he acts as an ‘evaluation’ or ‘orientation’ maker, cf. Labov & Waletzky 1967 and Labov et al. 1968; see also here § 7).

In order to clarify this point, let’s return briefly, one more time, to example (3), repeated here as (16).

- (16) [Context: Chief Superintendent Maigret and Judge Comélieau, speaking by telephone.]
- a. Maigret_i said to Comélieau: “I have captured the robber_j in Rue de Panama”.
 - b. Comélieau asked him_i: “Did you make him_j say where he has hidden the loot?”

(16) is an useful example to give, in a very economical way, a general view of the phenomena which the SLP aims to handle. However, (16) can not be considered a 'simple' example, because in (16b) the interpretation of the pronouns *him_i* and *him_j* relies on a kind of non-accessibility of the robber. In fact, if we look at the same constructed example assuming a different context – i.e., face-to-face dialogue, physical co-presence in the speaking situation, and the presence of the robber in the same place where Maigret and Comélieau are speaking – in a sense something similar to Sidner's (1979:153-155) 'Potential Actor Ambiguity Condition' has to be invoked. The reason has to be found in Comélieau's speech, which contains no vocatives helping us to clarify the Comélieau-to-Maigret locutive path. As a consequence, if the three individuals evoked by the example share the same physical situation, the proper interpretation of *him_i* and *him_j* in (16) – exactly as happens for the examples analyzed by Sidner (1979) in explaining her 'Ambiguity Condition' – requires a lot of knowledge and inferencing.

Let's assume, for instance, that the SLP is applied to the 'physical co-presence' situation just sketched for (16). Now, the SLP states that the (*Maigret.him_i*) association, if no vetoes are given by the ratification procedure, must be preferred to the association (*robber.him_i*), and that (*robber.him_j*), if no vetoes are given by the ratification procedure, must be preferred to (*Maigret.him_j*). In order to check the reliability of these predictions, for (16) a line of reasoning roughly may be sketched as follows: a) in a (highly) prototypical situation, an instance of a Chief Superintendent of the French Police does not hide loot; so, in such a situation, b) (*Maigret.him_j*) can not be licensed by the ratification procedure; as a consequence, c) *him_j* has to take the robber as its sponsor, and *him_i* has to be associated with Maigret. As for (16), in other words, the SLP, despite the 'physical co-presence' situation sketched above, still leads in a natural way to the correct associations.

Nonetheless, as for (16), notice that the tuning of a context in which the previous prototypical situation is discarded – i.e., a context where the (*Maigret.him_j*) and the (*robber.him_i*) interpretations can be the right ones – is straightforward. For example, a context may present Maigret as an accessory in a crime. Given such a context, in (16b), since the locutive path Comélieau-to-robber is accessible as well as the path Comélieau-to-Maigret, the interpretation (*Maigret.him_j*) can not be ruled out by the ratification procedure, and we are faced with a situation which strongly resembles those given by Sidner in explaining the need for her 'Ambiguity Condition' (1979:153-155).

Assuming the last scenario mentioned above, in fact, one of either (*Maigret.him_i*) or the (*robber.him_i*) associations can result, but one can not be sure which. Therefore, if we want to supplement a Sidner-derived system with the SLP, we must add to the focus-tracking machinery a condition able to flag a potential inappropriate use of a pronoun (e.g., if two potential sponsors inhabiting different layers can be licensed by the ratification procedure as the co-specifiers of the same pronoun, assume the preference suggested by the SLP, and flag the resulting (*sponsor.pronoun*) pair as a potential ambiguity). Sidner, in fact, explicitly assumes that a focus-based framework not only “must simulate the hearer’s behaviour in understanding anaphora”, but also “must simulate the hearer’s lack of understanding in certain bizarre cases” (1979:95), i.e., a possibility that, given the last scenario sketched above, may take place during the interpretation of (16).

However, it should also be stressed that whatever context we assume in order to evaluate *him_i* and *him_j* in (16), the distinct processes involved by this example can be represented by means of layers even if the sponsors of *him_i* and *him_j* – as allowed by the last scenario sketched above – may not appear in the same layer inhabited by the two pronouns. In fact, a hypothetical, subsequent situational anaphora (completely ignoring *Maigret said to Comélieau* and *Comélieau asked him*) may take the two quoted speeches as a single recruitment domain to set up its sponsor (e.g., ‘That was said by Maigret and Comélieau with their usual tone of voice’) ¹³.

7. Discourse structure, association domains and layers

Interpreting discourse structure as the result of a bundle of concurrent processes – which, in their turn, can be represented on layers dynamically marked by *s/w* values stating their foregrounding degree – seems an useful choice to supplement a focus model aimed at pronoun interpretation. The framework developed by Sidner, in fact, is not fully equipped to handle examples like (13) or (15). On the contrary, a layered view of discourse and the use of the SLP – when connected to a substantially revised, incremental version of Sidner’s Focus Theory, and to the observation of the changes in setting, tense and aspect – enables the correct interpretation of almost all the pronominal anaphors present in the more formalized texts of my AESS-based corpus ¹⁴.

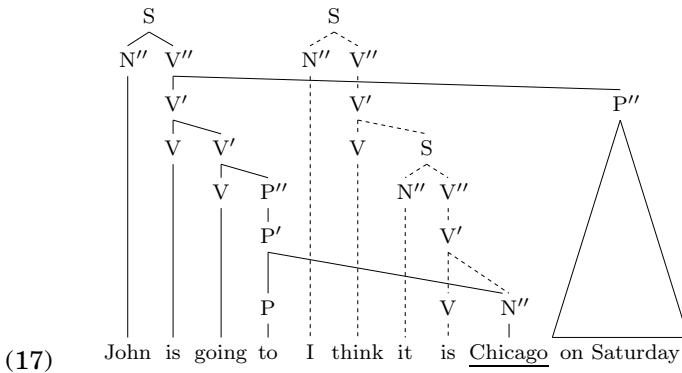
In this section I briefly discuss two further situations which seem to substantiate this ‘multi-dimensional’ nature of discourse structure

and its consequent impact on pronominal anaphora interpretation. In § 7.1 I discuss another aspect of the interaction between pronoun interpretation and quoted speech. In § 7.2 I give an example of a much more complex situation, taken directly from my AESS-based corpus.

7.1. Shared entities

Despite SLP's usefulness in driving the quoted speech and pronoun interpretation interaction, it is pointless to emphasize that it can prove inadequate in a large number of situations. Nevertheless, it should also be noted that at least parts of such situations can be reduced to only two types of occurrences of what here I call a 'shared entity' – i.e., a discourse entity co-specified by two or more linguistic objects which belong to at least two different layers.

These two entity sharing situations, as well as being more complicated to handle, are very different from the anaphoric situations exemplified by (13) or (15), where no shared entities exist. Moreover, they can not fail to bring to mind the 'syntactic amalgams' (Lakoff 1974) of the type represented in (17), where the straight and dashed branches show that the nodes belong to two different 'sentential layers', but where the 'Chicago' element of the skeleton is a shared resource.



And again, it should be stressed that if, in ordinary speech, such 'amalgams' are quite rare and exceptional as a syntactic phenomenon, their appearance seems much more common as a discourse phenomenon (e.g., with discourse entities or 'discourse relations' instead of syntactic objects as nodes), whether such 'discourse amalgams' are related or not to the insertion of quoted speech.

Without claiming to supply even a merely approximate typology of the shared resources which can be identified at the time that quoted speech appears, it is interesting to deal briefly with at least two entity sharing situations that are very diffuse in the personal narratives of my AEISS-based corpus. In fact, despite being very different in their basic nature, these two situations can be handled by a single, G&S machinery-free principle that can not be disregarded in stating sponsors accessibility constraints related to discourse structure. As in the last section, these two sharing situations are presented on the basis of real examples borrowed from Simenon (1992), the written novel which I use here in order to present, in a simple way, some discourse phenomena which occur in my oral AEISS-based corpus.

7.1.1. Type A

In my AEISS-based corpus of oral personal narratives, this first type of entity sharing situation is normally found in passages characterized, in their non-quoted speech part, by the imperfect tense, atelic eventualities, the lack of 'propulsive' verbal selections (i.e., what advances the narrative; Bertinetto 2001:196ff), and by orientational or evaluative discourse functions (Labov & Waletzky 1967; Labov et al. 1968). The owner of what follows the quoted speech may be fully explicit (i.e., the locutive path is simply 'performer-to-audience') or much more opaque, involving the so-called 'private states', etc.

Here follows an example taken from Simenon (1992:14); notice that the information provided by the passage opened by the \emptyset -anaphora is, for the owners of the quoted speeches, fully or at least in part given and shared; on the contrary, such information is not accessible to the recipient of the whole discourse, since the named entity 'Judel' is a first mention.

(18) [Context: Chief Superintendent Maigret (M_i) and Inspector Lucas (L_j).]

- | | | |
|------------------------|---|---|
| a. [M_i to L_j :] | "Chi si sta occupando del caso?" | "Who is on duty there?" |
| b. [L_j to M_i :] | "Judel _k ." | "Judel _k ." |
| c. | \emptyset_k Era un ispettore del X
arrondissement, un giovane
un po' malinconico
ma coscienzioso [...] | (He _k) was an inspector of the
10th arrondissement,
a young man a bit gloomy
but conscientious [...] |

Within the G&S's theory, this type of entity sharing situation can be analyzed as an instance of what, in the domain of interruptions, G&S call "digressions", i.e., "a strong interruption that contains a reference entity that is salient in both the interruption and the interrupted segment" (p. 195). However, if applied to (18), a G&S-based

analysis like ‘interrupted segment + digression’ raises many significant problems. Among these, the following may be mentioned:

- i. G&S “digressions” are defined as extemporaneous materials which do not involve a planned intention to deviate from the ‘interrupted segment’. However, as already pointed out, in my AESS-based corpus of personal narratives G&S’s “digressions” are mostly instances of what Labov and associates call orientation and evaluation sections, that is discourse fragments which have a specific displacement window expressed in a formal way by means of displacement sets and temporal junctures (Labov & Waletzky 1967). Despite this, it should be stressed that G&S’s theory pays no attention to the reasons for which ‘digressions’ may – or even must – be realized at a specific point of the ‘interrupted segment’. And this may cause a lot of problems to the theory. In (18), for instance, the ‘digression’ after the quoted speech seems far from being a fortuitous, extemporaneous, unplanned insertion. In fact, it allocates relevant properties for the named entity ‘Judel’ (e.g., Judel is an inspector of the 10th arrondissement, he is male, he is young), that is a bit of situated knowledge not accessible to the intended recipient of the whole discourse. Of course, because of the overall situation in which Judel is evoked, some of the general properties which characterize Judel may be guessed. Nevertheless, for the recipient of the whole discourse, without the ‘digression’ the example results in a much less intelligible object. Moreover, without the ‘digression’, a more appropriate first mention of Judel may be realized by something like ‘Judel, the/a young, male inspector of the 10th arrondissement’. But such a detailed description makes sense only for the intended recipient of the whole discourse, and not for the two speakers, which are represented in (18) as individuals which share the common ground in which ‘Judel’ and all his relevant properties are already allocated. Therefore, for the two speakers, such a description would be infelicitous, that is redundant, awkward, not desired or even ambiguous (cf. Dale & Reiter 1995; Gardent 2002) ¹⁵.
- ii. Assuming with G&S that discourse segments purposes can be adequately recognized, and that (18a) and (18b) accomplish purposes totally different from that of the ‘digression’ part, a conceptual/terminological problem may arise. Intuitively, in fact, (18c) – which in a sense ‘explains’ something related to the preceding discourse – in some way ‘contributes’ to (18a) and (18b). Moreover, (18b) – because of the (*Judel*.Ø) anaphoric relation – can only ‘precede’ (18c). But if we take, in their proper meaning, the ‘contributes to’ and ‘satisfaction-precedes’ relations posited by G&S, such an intuitive interpretation is far from being equal to that provided by G&S’s theory. Under G&S’s assumptions, in fact, (18c) does not ‘contribute to’ anything,

no 'satisfaction-precedes' relation holds between (18b) and (18c), and our Hobson's choice is to recognize a 'digression' opening. However, it is hard to agree with a picture presenting (18) as the result of an interrupted segment followed by a sort of deviation, as G&S's definition of digressions explicitly assumes. On the contrary, much like Lakoff's amalgams, (18) seems the result of a parallel, synchronized and multifaceted way to give a bundle of complex and different situated information, i.e., a situation determined by the presence of distinct, interacting, highly structured concurrent processes with a) clear-cut situated purposes; b) private data and working domains; and c) selective interfaces which allow for the proper use of the \emptyset -anaphora co-specifying Judel. At least in a very partial way, of course, the G&S's definition of 'digressions' handles this very common kind of entity sharing situation. In fact, for G&S, 'Speaking of x ...' is a sort of discourse marker commonly employed as a digression opener (cf. p. 195). Therefore, one may hypothesize that (18c) is a kind of grammaticalized or genre-related way to express something as 'Speaking of Judel, you [=the recipient of the whole discourse] must know that he_i ...', i.e., a 'digression' in which Judel is re-mentioned using a full definite NP. In no way, however, can this kind of entity sharing situation find its proper place in the G&S's theory. In a sense it re-proposes, in an amplified fashion, the deficiencies which characterize the theory when it is faced with discourse situations like the ones treated here in § 6. Moreover, it seems to add a lot of problems to the proper treatment of the 'intentional structure' upon which G&S's entire theory is built.

Leaving out these problems, which result from the application of a G&S's digression-based analysis to this type of entity sharing, in any case it should be noted that G&S's 'digressions' require the use of an 'atypical stack' equal to that hypothesized for the discourse situations exemplified here by (8), (9) and (12). This fact makes one think that G&S's 'true interruptions' and 'digressions' are, in reality, particular aspects of a more general and pervasive phenomenon. I am alluding to the interweaving of the elements in different layers, i.e., a phenomenon that can also occur in correspondence with the insertion of quoted speech into the discourse.

7.1.2. Type B

In my AESS-based corpus of personal narratives, this second type of discourse entity sharing is normally found in passages characterized, in their non-quoted speech part, by the perfect tense (or by the so-called 'historical present'), telic eventualities, the presence of propulsive verbal selections and by a 'referential' (Labov & Waletzky

1967) function. Quoted speech, moreover, not uncommonly raises expectations in the broad meaning indicated by Webber & Cristea (1997) (e.g., through suggestions), and in these cases the parts containing the pronoun(s) seem to supply satisfaction of expectation.

Here is an example taken from Simenon (1992:35).

- (19) [Context: Chief Superintendent Maigret (M_i) – who is inside the Brasserie Dauphine – and Judel (J_j); they are speaking by telephone.]
- a. [M_i to J_j:] “Tra poco, col referto medico, spero di ricevere [nuovi particolari sul cadavere]_k.” “Shortly, by means of the medical report, I hope to receive [new details about the corpse]_k.”
- b. Ø_i Li_k ricevette per telefono nel suo ufficio, verso le due e mezza. (He_i) received them_k by phone, in his office, round half past two o’clock.

If I properly understand the rather underspecified decisions assumed by G&S in order to split a discourse in ‘discourse segments’, the type of entity sharing situation exemplified by (19) may be analyzed in at least two ways. In the first case, one may consider (19a) and (19b) as members of the same ‘discourse segment’. In the second case, one may consider (19a) as pertaining to a ‘discourse segment’ different from the one containing (19b); in this case, we have a definitely closed segment which contains the quoted speech, that is, a situation analogous to that advocated by Kameyama (1998) for the example given here as (2).

Now, in the first case the sponsors of \emptyset_i ‘he’ and li_k ‘them’ are still on the discourse focus stack. Therefore, no problem arises with respect to the sponsorship accessibility domain. But the procedures hypothesized by G&S in regard to the identification of what they call ‘discourse segment’ rely, *inter alia*, on various types of clues, and in example (19) one can find a lot of relevant clues which prevent considering (19a) and (19b) as members of the same ‘discourse segment’ I am alluding, for example, to the radical change of situation involved (from Brasserie Dauphine to Maigret’s office), to tense and aspect shifts, and to intended recipients.

In the second case, if the ‘discourse segment’ containing the quoted speech is definitively closed (as Kameyama proposes for (2)), and therefore considered inaccessible for the search of the sponsors of \emptyset and *li*, what is the procedure we have to follow in order to interpret these two dependent expressions? In Kameyama’s work nothing is said about situations like (19). And the same holds for Cornish (2002) and Miltsakaki (2003), where similar techniques are suggested.

In any case, it should be noted that sharing situations like (19) constitute a real challenge for G&S's theory. In fact, if the 'global' coherence of a discourse is modeled by G&S through 'discourse segments' and focus spaces, the 'local' coherence and the treatment of pronouns are delegated by G&S to Centering Theory, which in its turn assumes a 'discourse segment' as its maximum working domain.

In order to see how these two theories can work hand-in-hand with respect to (19), let me suppose, on the basis of the lot of relevant cues mentioned above, that a 'discourse segment' boundary exists between (19a) and (19b). Under G&S's assumptions, however, the presence of such a boundary – that is a well grounded boundary, at least from an intuitive point of view – gives a strange result, i.e., that (19) is in some way incoherent or intrinsically not analyzable. In fact, Centering Theory has nothing to say about the two pronouns in (19b), since their sponsors belong to a different 'discourse segment'. And G&S's theory, strictly speaking, has nothing to say about pronoun interpretation, since it limits itself to handling 'global' focus spaces.

If we look at (19) with a cinematographic mind, however, this excerpt, like the type B sharing situations occurring in the oral personal narratives of my AEISS-based corpus, seems the result of a perfect editing operation¹⁶. The ellipsis and the consequent discontinuities between (19a) and (19b) – that is, what intuitively justifies the presence of a 'discourse segment' boundary – in fact do not cause incoherence. On the contrary, the absolute clarity of (19), despite the strong discontinuities that may be found in it, seems to rest precisely on the presence of the two pronouns in (19b), i.e., a glue-like presence which remains inexplicable under G&S's and Centering Theory assumptions, as well as under Kameyama's ones.

On the basis of examples like (19), it is hard to consider G&S's theory as a really useful means to track the 'global' focus of attention, i.e., a theory capable of acting as a proper shell for 'local' frameworks aimed at pronominal anaphora interpretation. In fact, when faced with examples like (19), G&S's 'discourse segments' and the stack of corresponding focus spaces result in being too naive and rough-hewn both to properly model the discourse structure and to state the impact of discourse structure on sponsorship domains. Intuitively, the inadequacies of G&S's theory in determining the 'global' focus of attention inhabited by the available sponsors rest on its poor consideration of the various dimensions exhibited by naturally-occurring discourses, that are not always so 'Flatlandian' as G&S's theory seems to assume. Moreover, judging by the data contained in my AEISS-based corpus, the role of these dimensions has to be parametrized at least on the

basis of the genre or ‘mode’ (Smith 2003) of the (stretch of) discourse under examination, i.e. a critical element to select, at a given processing point, the foregrounding degrees of the layers available for an anaphoric association¹⁷.

7.1.3. Type A and B shared entities: a principle

By viewing discourse as a bundle of interacting concurrent processes, the type A and B sharing situations exemplified above can be explained by a very simple principle which does not exploit G&S’s machinery. This principle, which appears valid for all the personal narratives contained in my AESS-based corpus, can be stated as follows:

A/B PRINCIPLE. If a) an individual *i* is the owner (cf. fn. 9) of a stretch of discourse, and b) if an individual *j* is in his turn the owner of a stretch of discourse quoted within *i*’s discourse, then the discourse entities evoked by *j*’s discourse are accessible – in terms of sponsorship and co-specification – for *i*’s pronouns.

In other words, this G&S machinery-free principle states that a discourse process *i* can intervene in a discourse process *j* launched within *i*’s ownership domain. This asks for the application of one or more RRS to the $\pm\alpha$ labels of the layers on which *i* and *j* can be represented (cf. (11)), i.e., the foregrounding of a layer which shares one or more resources (discourse entities, in this case) with the formerly foregrounded layer.

However, in order to support a flawless discourse, this simple principle has to work together with conditions not directly related to the focus of attention or the accessibility domain of the involved sponsors. I am alluding, for instance, to the relevance of what is inserted (cf. the above discussion about the ‘Judel’ entity) or to the specific genre, ‘mode’ or even the actual presentation modalities of the (stretch of) discourse in which a type A or B sharing situation appears¹⁸.

7.2. Pronouns and associations in a complex interaction: an example

From the above discussion about pronouns, quoted speech and discourse structure, it seems quite obvious to me that discourse offers to language users a set of devices which allow one to build up highly structured discourse models, i.e., repositories able to dynamically handle, as the discourse unfolds, the presence of entities which can be shared, differently situated, perspectivized, etc.

Intuitively, however, the fact that discourse is able to offer to a language user such a richness of devices just to allow his handling of the concurrent processes related to quoted speech or partly similar phenomena (e.g., unattached 'orphans' at syntactic structure; see, inter alia, Espinal 1991, Haegemann 1988, Huddleston & Pullum 2002; cf. also Sells 1985, Webber et al. 2003:552ff) appears quite implausible. So, it seems natural to hypothesize that such a richness is, more simply, a general property of discourse.

In order to substantiate this view, let me close the paper by saying a few words about the selling interactions contained in my AESS-based corpus.

These interactions are far from being equal to the selling negotiations analyzed by Mitchell (1957). In the situations analyzed by Mitchell, in fact, the seller and the potential buyer know exactly the nature of the object for which the negotiation is taking place. Moreover, both of them know exactly how to use the object and in what contexts it can be used. In the street talk of my corpus, on the contrary, the seller offers novelties, unfamiliar objects. As a consequence, the audience has some basic expectations (What is this object? What is its purpose? Why has one to buy it?) that the seller has to satisfy *before* to putting into practice the sale. For that reason, before the sale, the seller has to explain what kind of object he is proposing, what are the procedures to follow in order to assemble and use it, etc. In other words, he has to realize a kind of how-to-do-it, expert-apprentice task-oriented discourse (Grazioli 1992).

In my selling situations, however, the task-oriented thread is only a part of the whole¹⁹. In fact, in order to set up a successful selling interaction, much more information is needed from the sale-ring. I am alluding to the explication of the *raison d'être* of the object on sale (sometimes given by the seller through a comparison with familiar objects), the concrete demonstration that the object is really capable of doing what it is said to do, etc. The task-oriented thread, moreover, may be performed by the seller:

- a) by giving only a visual explanation of the steps to be executed in order to properly assemble and utilize the object on sale;
- b) by saying what a buyer has to do in order to assemble and utilize the object; therefore, in this case, we have one or more verbal instructional sequences of the type: 'in order to assemble the object, do action *a*, and then *b*, etc.; in order to properly utilize the object, do action *x*, and then *y*, etc.';
- c) by mixing these two strategies.

In my corpus, only this third solution occurs. But this solution, for the purposes of the current paper, is also the most interesting one. By mixing the two strategies, in fact, the objects and the situations which should be managed in the course of the task-oriented thread – and therefore by the overall discourse model – are at least two:

- i. a) The object directly manipulated by the seller in order to visually present the object's characteristics, its use, etc., and b) the situation in which this object inhabits, i.e., the situation bounded to the here and now of the selling interaction.
- ii. a) The object that a (still potential) buyer may use when he needs this object to do something, and b) the situation in which this object inhabits, i.e., a 'pure', abstract instructional sequence which is inherently unbounded to any specific time or place, and that can be encapsulated in a time and place bound situation only for the sake of exemplification.

Despite instances of the same entity, the two objects – as happens, in a sense, for the discourse entities involved in some kind of *one*-anaphors, in so-called 'paycheck sentences' (Karttunen 1976; Conte 1988), and in other situations involving 'partial anaphors' (LuperFoy 1991, 1997) – are therefore distinct but in some way inter-related, and the situations onto which these objects are mapped are equally distinct – even if, to some extent, they are conceptually overlapping. Moreover, it should be noted that the sequence of actions mentioned in the course of the task-oriented thread is in various ways interwoven with the sequence of actions performed by the seller during his speech (e.g., the 'visual' explanation), and with what the seller says during the sequence of actions he is actually doing.

Normally, these interwoven threads of differently situated information result in complex shared properties and relations between the discourse entities which inhabit the two co-occurring situations. But again, note that, in these selling interactions, frequently the sharing is not equal to that shown above on the basis of Simenon's novel. As a matter of fact, in the discourse model related to example (18) we have a single 'Judel' entity, and this entity – much like the 'Chicago' node of Lakoff's example given here as (17) – belongs to two distinct layers. In the selling interactions contained in my AESS-based corpus, on the contrary, the sharing may be a matter of complex and subtle interrelationships between distinct discourse entities belonging to distinct layers. In fact we may have a discourse entity for the object which inhabits the abstract instructional sequence, a discourse entity for the object actually used in the here and now

of the interaction, a discourse entity – evoked by a situational anaphora pertaining to the here and now of the interaction – which must be instantiated on the basis of the recruitment of the material on the right frontier of the *s/w* structure related to the abstract instructional sequence, etc.

Here follows an example in which one of such situations appears.

- (20) [The example is an excerpt of a selling interaction recorded in Piazza del Duomo (Milan) in date 12/03/1982 by AESS staff. The seller (S) makes his speech trying to sell to the audience (A) a portable, small VHF/UHF antenna (= type-A antenna) that he claims to be usable in place of a standard, big roof-type VHF/UHF TV antenna (= type-B antenna). The selling-point of type-A antenna put forward by the seller is that type-A antennas allow a potential buyer to use a standard TV in places where no antenna sockets exist (e.g., in one specific room of a house) and in places where no type-B antennas are available (e.g., holiday homes, campers, etc.). At his pitch the seller has, inter alia, a) a portable TV; b) a huge type-B antenna – located at the top of a high post and connected to the portable TV – which stands for a roof-placed antenna; c) a lot of type-A antennas on sale. The seller is explaining to the audience how to unplug from a TV a type-B antenna in order to replace it with a type-A antenna. The symbol ‘†’ in the utterance (b) is a *crux desperationis*.]

- | | | | |
|----|-----------|--|--|
| a. | [S to A:] | Noi a casa giriamo il TV. | At home, let's turn the TV. |
| b. | | E arriviamo († in) un attimo
all'allaccio dell'antenna. | And let's arrive in a moment
at the antenna plug [of the TV]. |
| c. | | Stacciamo il cavo
dell'antenna del TV. | Let's unplug the [type-B]
antenna's cable from the TV. |
| | | [S, executing the action evoked in the preceding line:] | |
| d. | | Guardate quanto Ø è
semplice. | Look how simple Ø
(=it/this/that) is. |

In (20), the first three lines give the instructions that a type-A antenna potential buyer – i.e., the 1st pl. person which in the utterances stands for ‘anyone who wants to use a type-A antenna’ – has to follow in order to unplug a type-B antenna from a TV. Therefore, in terms of the G&S's theory, what is conveyed by (20a) satisfaction-precedes (20b), which in its turn satisfaction-precedes (21c).

(20d), on its part, has three possible interpretations. Ignoring the first one (which can be rendered as ‘look, here and now, how simple it is to execute the action I am doing here and now’), the second interpretation frames (20d) as a further step of the preceding (20a-c) instructional sequence, and the third interpretation frames (20d) as linked to the selling interaction (i.e., ‘look, here and now, how simple

it is to execute the aforementioned step(s) (20c)/(20a-c)', where the choice of the material on the right frontier of the abstract instructional sequence is a matter of the hearer(s)).

However, this third interpretation seems much more plausible than the second. In fact:

- i. (20d) expresses an atelic eventuality. Given the absence of temporal expressions like 'for x time', 'until t ', 'from t_x to t_y ', in a step-by-step instructional sequence the use of such an atelic eventuality appears quite odd.
- ii. (20d) marks a shift in grammatical person, from the 1st pl. appearing in (20a-c) (the 'we' acting as 'anyone who wants to use a type-A antenna') to the 2nd pl. (the audience).

Adopting this third and much more plausible interpretation of (20d), no satisfaction-precedence holds between (20c) and (20d).

Needless to say, in order to support the information available in (20), the discourse model must be radically enriched with non-linguistic entities (see, for instance, the LuperFoy-based choices made by Pflieger 2004 and Wahlster 2003, 2006). In any case, leaving aside this very complex problem, it should be stressed that the \emptyset -anaphora in (20d) – assuming the third interpretation given above – has to recruit its sponsorship domain in a different situated region of the discourse, i.e., the abstract, time unbounded instructional sequence evoked by (20a-c). Therefore, in order to give a proper interpretation of the \emptyset -anaphora, in (20) we have to consider two heterogeneous, interacting, concurrent, and – as happens in fragments containing quoted speech – to some extent 'distributed' processes, which can be at least described (in order to evaluate the possible strategies adopted for pronoun interpretation) by means of layers.

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Notes

- * This article is a slightly revised version of the final sections of Grazioli (1997b), a position paper circulated among the participants of the courses held at Pavia University under the supervision of Professor Maria-Elisabeth Conte in the Academic Year 1996-97. I wish to thank Susann LuperFoy, Kari Fraurud,

Sophie Cormack and Barbara Di Eugenio for having supplied me, at that time, with some hard-to-find unpublished papers. I would also like to thank two anonymous reviewers for their valuable comments on a previous version of the paper. I am profoundly indebted to Professor Maria-Elisabeth Conte (1935-1998) for her helpful criticism as the ideas in the paper were being developed. What may be found to be interesting in the present pages is dedicated to her memory.

¹ I adopt here the terminology introduced by Sidner (1979) and successively utilized by various scholars. In Sidner's view, a speaker 'refers' to something by utterances that 'specify' its corresponding discourse entity. In other words, "referring is what people do with words" (Sidner 1983:269), and "specifying" is what discourses do (Sidner 1979:260-264). In Sidner's computational framework, the entities specified are database items which bear well-structured correspondence to objects in the word.

² Cormack's ratification procedure does or does not license the anaphoric relation between the two elements of an association (*potential-sponsor.anaphora*) on the basis of:

- a) agreement features, and syntactic and semantic standard constraints (see, among many others, Bosch 1983, Carter 1987 and Di Sciullo 2005, 2006);
- b) general inferencing based on a standard knowledge base, i.e., an ontology-based domain model.

³ The stack used by G&S is a data structure also known as 'first-in last-out list'. The operations available in such a kind of structure are a) 'push': add a new element x to the top of the stack; b) 'pop': remove and return an element off the stack; if a specific item x on the stack is 'popped', then all elements above x are deleted from the stack and x is deleted and returned. In linguistics, probably the best known (implicit) use of such a dynamic data structure is that given in Jakobson (1941; see especially Chapter 2).

⁴ The default visiting order of a preferential tree can be stated as follows: if the node n_i which most immediately dominates the current DTE is one of the two reversed nodes already visited by a RR, the RR has to be applied to the node that immediately dominates n_i and its sister node; otherwise, the RR has to be applied to n_i and its sister node. Given the tree in (6), for example, if subsequent applications of RRS come to identify k as the DTE, and k can not be approved by the ratification procedure, the next RR has to be applied to the sister nodes s_2 and w_2 . Again, if all the terminal elements of the sub-tree rooted at s_3 are unable to satisfy the ratification procedure with regard to an incoming pronoun P , a RR $[R[w_3 s_3]] \Rightarrow [R[s_3 w_3]]$ will have the DTE role played by a , and further RRS can be applied in order to evaluate, as potential sponsors of P , the remaining terminal elements of the tree.

⁵ The corpus employed to make this preliminary analysis is composed of a very small subset of the oral texts available from AESS, the archive of the Regione Lombardia which collects Italian documents of ethnographic relevance (see <http://www.aess.regione.lombardia.it>). In particular, the texts composing the corpus may be ascribed to three categories, all accepting a basic Labov-style analysis: a) personal narratives; b) traditional narrative songs very similar to the ones usually named 'ballads' in Anglo-Saxon tradition and 'romances' in Hispanic tradition (cf. Mirrer-Singer 1980); and c) sales street-talk concerning goods at least partially unknown to the potential buyers, i.e., strange gadgets for cleaning, multi-purpose food processors, etc. (cf. Grazioli 1992). Unfortunately, for the specific aims of the present paper, this AESS-based corpus suffers two practical inadequacies. First, all the texts contained in the corpus are orally performed, and, at least in part, they heavily depend on speech/visual situation, gesture, prosody and paralinguistic features. Secondly, the corpus is mostly composed of discourses spoken in vari-

ous Italian dialects characterized by a particularly complex clitic syntax (Poletto 1997). As a result, the use in the paper of examples borrowed from this AESS-based corpus would have required at least: a) the insertion of a lot of information related to prosody, gesture, perceptive context, etc. not really relevant for the specific aims of the present paper, but no doubt relevant in order to fully understand the examples; b) a lot of caveats related to clitic doubling structures. Hence my choice to rule out from the paper, with the exception of one, examples taken from my AESS-based corpus, using instead constructed examples and real examples borrowed from a written novel (Simenon 1992). Notice that this solution is used in the paper exclusively for the sake of clarity, and that all the examples given in the paper have at least one counterpart example in my AESS-based corpus.

⁶ Space unfortunately prevents a discussion of pronominal situational anaphors, which, as mentioned above, are strongly connected to the material on the discourse stack that in G&S models the 'global' focus of attention. In any case, it should be noted that the difficulties which sometimes may be encountered in the delimitation of the recruitment domains of these anaphors are not to be underestimated. Consider, for instance, the following example (from Di Eugenio 1989):

[C_{1.1} We left the city] [C_{1.2} I was born in] [C_{1.3} when I was 15.]
[C₂ This was a deep shock for me.]

Advocating the possibility of a partial recruiting of the elements available in the right frontier of a Webber-based discourse tree representation, Di Eugenio writes:

It is clear that *this* in C₂ refers to "leaving the city I was born in": it seems to me that the temporal clause C_{1.3} "when I was 15" is not included in the reference. (p. 132)

For similar situations related to the proper identification of a situational sponsorship domain see, among others, Fraurud (1992) and Maes (1996), where pronominal anaphora is discussed. For 'encapsulating', full definite NP anaphors – which, though sometimes hypothesized as strongly connected to the notion of focus of attention (e.g., Hitzeman & Poesio 1998), seem to override whatever focus-related phenomenon on the basis of lexical selections and general knowledge – see, among others, D'Addio (1988), Conte (1996) and Consten & Knees (2005).

⁷ "An interruption is a discourse segment whose DSP is not dominated nor satisfaction-preceded by the DSP of any preceding segment" (G&S:192).

⁸ In a standard multi-dimensional representation, different characteristics can be represented on different planes that all converge on a common base; this base is what is called the 'skeleton'. In other terms, each of the various planes can be imagined as being situated on the page of a book, where the skeleton is the spine and where each page is the basis of a representation.

⁹ I use here the term 'owner' to identify the individual who, in a sense, is intended to assume the responsibility for the utterances contained in a discourse. So, if John tells a personal narrative in which at some point appears Mark, who in his turn realizes a speech quoted in John's narrative, Mark is the 'owner' of his own speech, and John is the 'owner' of the whole narrative, comprising Mark's speech. Needless to say, I use here the term 'owner' simply to avoid the complexities of a proper treatment of quoted speech (see, among many others, Wierzbicka 1974).

¹⁰ Notice that this formulation of the SLP is not equipped to handle other well-known 'distributed' discourse situations. I am alluding, for instance, to the co-present foci hypothesized by Sidner to process stretches of discourse containing 'the one ... the other' and 'this (NP) ... that (NP)' (1979:189-217), or the mixing of different discourse segments observed by Rosé (1995; see especially § 1.2). A more elaborated version of the SLP is given in Grazioli (1996). In any case, the partial formulation of the SLP given above is enough for the aims of the current paper.

¹¹ Example (13) and most of the remaining examples in the paper are in Italian. Note that Italian has both null and overt pronouns, and that their use is not always equivalent (see (i) and (ii), from Di Eugenio 1990).

- (i) Quando Carlo_i ha incontrato Mario_j, Ø_{i/lj} non gli_{i/lj} ha nemmeno detto "ciao".
When Carlo_i has met Mario_j, he_{i/lj} not to-him_{i/lj} has even said "hi".
- (ii) Quando Carlo_i ha incontrato Mario_j, lui_{i/lj} non gli_{i/lj} ha nemmeno detto "ciao".
When Carlo_i has met Mario_j, he_{i/lj} not to-him_{i/lj} has even said "hi".

For the characteristics of the Italian pronominal system and for the problems it involves regarding the processing of anaphors see, among others, Calabrese 1986; Di Eugenio 1990, 1998; Not & Zancanaro 1995; Samek-Lodovici 1996; Grimshaw & Samek-Lodovici 1998; Carminati 2002; Buchwald et al. 2002 and Trecci 2003.

¹² This reconstruction is possible thanks to the presence of the quotation marks, to the presence in the situation of only two individuals, and to the possibility of discovering – on the basis of the previous context – the identity of the one who gets the dialogue underway. For some notes related to participants' tracking in quoted dialogues see Grazioli (1995).

¹³ By the way, it may be interesting to note that the disambiguation of *him_i* and *him_j* in (16) can be tackled on the basis of alternative strategies, at least in part depending on the processing framework assumed. For example, an incremental processing approach can identify, in (16b), the utterance *Comélieau asked him* as a proper chunk to feed the focus machinery. In this case – if the SLP is activated – (*Maigret.him_i*) results in the (defeasible) starting choice to interpret (16), i.e., a choice which may be discarded on the basis of information provided later in the text. In any case, notice that nothing similar to the just discussed (*robber.him_i*) association appears in my AESS-based corpus. The ultimate reason of this lack probably has to be found in the following remarks, taken from Carter (1987:17):

It seems plausible that a considerably-written text (i.e., one that is perspicuous and unambiguous, in accordance with Grice's maxim of manner) will normally be constructed in such a way that constraints on interpretation derived from different kinds of knowledge [i.e., linguistic and non-linguistic knowledge; RG] will tend not to conflict but rather to confirm one another and work together to guide the reader towards correct interpretations. Moreover, because language has some degree of redundancy, the same information may often be contained in more than one constraint or prediction. For example, when resolving a pronoun, we might expect that the most focused possible referent will usually also be the one that CSI [Common Sense Inference (processor); RG] suggests is the most plausible.

On the basis of such remarks, and judging by the data contained in my AESS-based corpus, it seems to me that, in order to force a (*robber.him_i*) interpretation like that allowed, in a very specific case, by (16), a speaker/writer must adopt a more perspicuous linguistic formulation. I am alluding, for instance, to the use of a full definite NP instead of *him_i* (see, among many others, Westergaard 1986: § 4.2.4) or the insertion of a vocative (cf. Grazioli 1995) in Comélieau's speech.

¹⁴ I am alluding here to the traditional narrative songs (see fn. 5), which have highly constrained linguistic and discourse structures. Notice that, in the texts of these songs, a lot of puzzling questions related to anaphora interpretation (e.g., discourse discontinuities, tense and aspect shifts, participants' tracking issues, etc.) can find a lot of answers on the basis of:

- a) the structuring of the songs in stanzas, which can be assumed as well-defined building blocks for the construction of the discourse;
- b) the absence of marked prosodic patterns (i.e., one of the factors which may come into play during the selection of a sponsor; see, among many others,

Cantrall 1969, Oherle 1981, Kameyama 1999, De Hoop 2004) because of the association of the text with a tune and a metrical structure (for similar narrative songs pertaining to the Anglo-Saxon tradition see, among others, Kiparsky 2005);

c) the traditional, modular and formulaic mode of oral composition.

For some brief notes about an implemented computer system based on a pronominal anaphora processing framework embodying the ideas presented in the current paper, and capable of handling the pronouns present in the narrative songs of my AEES-based corpus, see Grazioli (1997a:112ff).

¹⁵ With regard to the distinction between dependent expressions realized as pronouns or as full definite NPs, it is interesting to note that this kind of situation is not restricted to (*full-definite-NP.pronoun*) and (*situational-recruitment-domain.pronoun*) pairs, but holds for full definite (*NP.NP*) pairs too. Here is an example, taken from Simenon (1973:16), representative of a situation which is rather common in my AEES-based corpus of personal narratives; in the example, the canonical (*sponsor.anaphora*) pattern (e.g., '[Victor Cadet]_i... Victor_i / Cadet_i', where the dependent expressions contain no information that their sponsor lacks) is reversed, and 'Victor' is a first mention.

[Context: a 'brigadier,' of the French Police, and Victor_j, a diver.]

Le brigadier_j, qui avait demandé un autre numéro, attendait qu'on lui réponde.

- Allô! Victor_j? Je t'éveille? Tu étais déjà à déjeuner? Tant mieux. J'ai du boulot pour toi.

[Victor Cadet]_j n'habitait pas très loin de là, rue du Chemin-Vert, et un mois ne passait rarement sans qu'on fit appel à ses services au Canal Saint-Martin. C'était sans doute l'homme qui avait retiré le plus d'object hétéroclites, y compris des corps humains, de la Seine et des canaux de Paris.

¹⁶ Note that here I adopt a movie-related terminology only for the sake of convenience. In fact the use of similar verbal techniques dates much earlier than filmmaking (see, among others, Hatcher 1942).

¹⁷ It is unclear to me if G&S's theory can be amended in order to handle a multi-dimensional view of discourse structure. Some remarks on this topic, given on the basis of 'discourse segments' representations like (7b), but distributed on different layers similar in spirit to the functional categories used by some syntactic theories, are contained in Grazioli (1996). Here, in defining a kind of possible factoring of discourses in something faintly resembling to G&S's 'discourse segments', a particular attention is given to the co-occurrence of different kinds of discontinuities available along various discourse dimensions of the personal narratives contained in my AEES-based corpus. Of course, the result – no matter how useful it may be, at least from a descriptive point of view – is very different from that produced by a standard G&S's analysis, i.e. a single tree with sharp boundaries between not layerized 'discourse segments'. By the way, in the same paper some remarks are given about the appearance – in the personal narratives of my corpus – of non-active diathesis constructions, i.e., a topic that, although relevant for handling anaphoric relations, both Sidner (1979, 1981, 1983) and G&S ignore. In this regard, consider for instance example (i), taken from Rizzi (2006) with minor notation changes.

(i) [Context: a dialogue between A and B.]

- | | | | |
|-----|-----------|---|--|
| a. | [A to B:] | "Che cosa è successo?" | "What happened?" |
| b. | [B to A:] | "Un camion _i ha tamponato un autobus _j , poi Ø _i è ripartito." | "A truck _i bumped into a bus _j , then (it _i) left." |
| b'. | [B to A:] | "Un autobus _i è stato tamponato da un camion _j , poi Ø _i è ripartito." | "A bus _i was bumped into by a truck _j , then (it _i) left." |

Whatever meaning we associate with canonical thematic roles such as 'theme', 'affected object', 'causer', 'initiator', 'experiencer', etc., Sidner's theory is unable to handle in a transparent way the alternation appearing in (i.b) and (i.b'). Nonetheless, in trying to handle examples like (i), a 'local' framework as Sidner's one can be easily and successfully amended. Despite such a possibility, however, if a 'global' perspective about the appearance of canonical passive, impersonal and so-called 'SI/SE' (cf. Frigeni 2004 and references cited therein) constructions is assumed, 'local' procedures derived from the rearrangement of Sidner's framework seem quite *ad hoc* solutions, no matter of their success in handling examples like (i). In fact, such constructions, albeit their impact on pronoun interpretation is different in type, on a global account seem to act as differently situated processes analogous to those analyzed here by means of layers. This, at least, is what appears on the basis of the personal narratives of my AESS-based corpus. For some general remarks about such constructions and their possible effect on discourse see, among others, Sansò (2006) and the works cited therein about the so-called 'agent-defocusing strategies'.

¹⁸ For instance, if a speaker gives an exegesis of a text, the frequency of the type A shared entities can be very high without making awkward the overall discourse. On the contrary, the same frequency may appear inappropriate in the course of a plain, ordinary personal narrative. Again, note that the genre or the 'mode' of a (stretch of) discourse is a critical element also for a correct application of the SLP. Without the definition of a proper working domain, in fact, the SLP may lead to over-generation (i.e., it allows, if plainly stated as in § 6, for inappropriate possible applications). Some remarks about the domain of the SLP in the personal narratives contained in my AESS-based corpus are given in Grazioli (1996). Here, in overviewing the SLP domains and the processing issues involved by the SLP and the A/B principle applications (quite different in their results), a leading role is given to Labov's 'functions' and to his analysis of the overall structure of a personal narrative. For a more general hypothesis related to problems to some extent similar to that involved with the SLP application see Rosé (1995:61-62), where it is hypothesized that such kind of problems can be treated on the basis of linear models (cf. Walker 2000).

¹⁹ Note that I use here the term 'thread' not in the technical, computational sense (i.e., a lightweight process that shares some system resources, such as a virtual address space, with a group of other processes), but in the ordinary sense utilized by a widespread metaphor (Cardona 1976:210) in order to represent the structure of discourse (e.g., "discourse is structured as a tapestry of interwoven threads", Rosé 1995:1).

Bibliographical References

- ARNOLD Jennifer E. 1998. *Reference Form and Discourse Patterns*. Stanford, CA: Stanford University. PhD dissertation.
- ASHER Nicholas 1993. *Reference to Abstract Objects in Discourse*. Dordrecht: Kluwer.
- AVESANI Cinzia & Mario VAYRA 1992. Discorso, segmenti di discorso e un'ipotesi sull'intonazione. In CRESTI ELENA, NICOLETTA MARASCHIO & LUCA TOSCHI (eds.). *Storia e teoria dell'interpunzione*. Roma: Bulzoni. 355-408.
- AZZAM Saliha 1995. *Traitement informatique des ambiguïtés (Anaphores et Rattachement du syntagme prépositionnel) du langage naturel*. Paris: Université de Paris-Sorbonne (Paris IV). Thèse de Doctorat.

- BARWISE Jon & John PERRY 1983. *Situations and attitudes*. Cambridge, MA: MIT Press.
- BEAVER David I. 2004. The optimization of discourse anaphora. *Linguistics and Philosophy* 27. 3-56.
- BERRETTA Monica 1990. Catene anaforiche in prospettiva funzionale: antecedenti difficili. *Rivista di Linguistica* 2. 91-120.
- BERTINETTO Pier Marco 2001. On a frequent misunderstanding in the temporal-aspectual domain: the 'perfective-telic' confusion. In CECCHETTO Carlo, Gennaro CHIERCHIA & Maria Teresa GUASTI (eds.). *Semantic Interfaces: Reference, Anaphora, Aspect*. Stanford, CA: CSLI. 177-210.
- BOBALJIK Jonathan D. 1999. Adverbs: The hierarchy paradox. *Glot International* 4. 27-28.
- BOSCH Peter 1983. *Agreement and Anaphora: A Study of the Role of Pronouns in Syntax and Discourse*. London: Academic Press.
- BUCHWALD Adam, Oren SCHWARTZ, Amanda SEIDL & Paul SMOLENSKY 2002. Recoverability optimality theory: Discourse anaphora in a bidirectional framework. In BOS Johan, Mary Ellen FOSTER & Colin MATHESON. *Proceedings of the Sixth Workshop on the Semantics and Pragmatics of Dialogue*. Edinburgh: University of Edinburgh. 37-44.
- CALABRESE Andrea 1986. Some properties of the Italian pronominal system. An analysis based on the notion of *theme* as subject of predication. In STAMMERJOHANN Harro (ed.). *Tema-Rema in Italiano / Thema-Rhema im Italienischen*. Tübingen: Gunter Narr Verlag. 25-36.
- CANTRALL William R. 1969. Pitch, stress, and grammatical relations. In *Papers from the 5th Regional Meeting of the Chicago Linguistic Society*. Chicago: Dept. of Linguistics, University of Chicago. 12-24.
- CARDONA Giorgio Raimondo 1976. *Introduzione all'etnolinguistica*. Bologna: Il Mulino.
- CARMINATI Maria Nella 2002. *The Processing of Italian Subject Pronouns*. Amherst: University of Massachusetts. PhD dissertation.
- CARTER David 1987. *Interpreting Anaphors in Natural Language Texts*. Chichester: Ellis Horwood.
- CINQUE Guglielmo 1999. *Adverbs and Functional Heads: A Cross-Linguistics Perspective*. New York: Oxford University Press.
- CONSTEN Manfred & Mareile KNEES 2005. Complex Anaphors in Discourse. In SASSEN Claudia, Anton BENZ & Peter KÜHNLEIN (eds.). *Constraints in Discourse*. Dortmund: Universität Dortmund. 115-120.
- CONTE Maria-Elisabeth 1988. *Condizioni di coerenza. Ricerche di linguistica testuale*. Firenze: La Nuova Italia.
- CONTE Maria-Elisabeth 1996. Anaphoric encapsulation. *Belgian Journal of Linguistics* 10. 1-7.
- CORMACK Sophie 1992. *Focus and Discourse Representation Theory*. Edinburgh: University of Edinburgh. PhD dissertation.
- CORNISH Francis 2002. Anaphora: lexico-textual structure, or means for utterance integration within a discourse? A critique of the Functional Grammar account. *Linguistics* 40. 469-493.
- CRISTEA Dan, Nancy IDE & Laurent ROMARY 1998. Veins theory: A model of global discourse cohesion and coherence. In *Proceedings of the 36th Annual*

- Meeting of the Association for Computational Linguistics and of the 17th International Conference on Computational Linguistics*. Montreal: Université de Montréal. 281-285.
- D'ADDIO Wanda 1988. Nominali anaforici incapsulatori: un aspetto della coesione lessicale. In Tullio DE MAURO, Stefano GENSINI & Maria Emanuela PIEMONTESE (eds.). *Dalla parte del ricevente. Percezione, comprensione, interpretazione. Atti del XIX congresso internazionale della Società di Linguistica Italiana (Roma, 1985)*. Roma: Bulzoni. 143-151.
- DALE Robert & Ehud REITER 1995. Computational interpretations of the Gricean maxims in the generation of referring expressions. *Cognitive Science* 19. 233-263.
- DE HOOP Helen 2004. The interpretation of stressed pronouns. In BLUTNER Reinhard & Henk ZEEVAT (eds.). *Optimality Theory and Pragmatics*. London: Palgrave Macmillan. 25-41.
- DI EUGENIO Barbara 1989. Clausal reference in Italian. *The Penn Review of Linguistics* 13. 122-135.
- DI EUGENIO Barbara 1990. Centering theory and the Italian pronominal system. In *13th International Conference on Computational Linguistics*. Helsinki: University of Helsinki. 270-275.
- DI EUGENIO Barbara 1998. Centering in Italian. In WALKER Marylin, Aravind JOSHI & Ellen PRINCE (eds.). *Centering in Discourse*. Oxford: Clarendon Press. 115-137.
- DI SCIULLO Anna Maria 2005. Handling pronouns intelligently. In FUJITA Harnido & MOHAMED MEJRI (eds.). *New Trends in Software Methodologies, Tools and Techniques - Proceedings of the fourth SoMet_W05*. Amsterdam: IOS Press. 385-416.
- DI SCIULLO Anna Maria 2006. Pronominal anaphora processing. *Proceedings of World Academy of Science, Engineering and Technology* 11. 74-79.
- ECKERT Miriam & Michael STRUBE 2000. Dialogue acts, synchronising units and anaphora resolution. *Journal of Semantics* 17. 51-89.
- ESPINAL Teresa M. 1991. The representation of disjunct constituents. *Language* 67. 726-762.
- FILLMORE Charles J. 1975. *Santa Cruz Lectures on Deixis*. Bloomington: Indiana University Linguistics Club.
- FOX Barbara A. 1987. *Discourse Structure and Anaphora*. Cambridge: Cambridge University Press.
- FRAURUD Kari 1992. *Situation reference (What does 'it' refers to?)*. GAP working paper no. 24, Fachbereich Informatik. Hamburg: Universität Hamburg.
- FRIGENI Chiara 2004. 'How do you miss your external argument?' Non-active voice alternations in Italian. *Toronto Working Papers in Linguistics* 23. 47-94.
- GARDENT Claire 2002. Generating minimal definite descriptions. In *Proceedings of the 40th Annual Meeting of the Association for Computational Linguistics*. Philadelphia: University of Pennsylvania. 96-103.
- GOLDSMITH John A. 1976. *Autosegmental Phonology*. Cambridge, MA: MIT. PhD dissertation. Distributed by Indiana University Linguistic Club.

- GOLDSMITH John A. 1990. *Autosegmental & Metrical Phonology*. Oxford: Blackwell.
- GOODALL Grant 1987. *Parallel Structures in Syntax. Coordination, Causatives and Restructuring*. Cambridge: Cambridge University Press.
- GRAZIOLI Riccardo 1992. Tempo, testo e imbonimenti di dimostrazione. In D'AMADIO Milvia (ed.). *I segni dei mestieri*. Roma: MNATP. 203-214. [Draft: <http://aess-stream.regione.lombardia.it/grazioli/mnatp.pdf>]
- GRAZIOLI Riccardo 1995. Verbal concision in Piedmontese ballad texts: the use of the vocative. In PORTER JAMES (ed.). *Ballads and Boundaries*. Los Angeles: UCLA. 174-187.
- GRAZIOLI Riccardo 1996. Layers. Pavia: Università di Pavia. Ms.
- GRAZIOLI Riccardo 1997a. Performances orales et object d'archives. In VETTRAINO-SOULARD Marie-Claude (ed.). *Séminaire Ecrit, image, oral et nouvelles technologies 1996-1997*. Paris: Publications de l'Université Paris 7 - Denis Diderot. 91-126. [Draft: <http://aess-stream.regione.lombardia.it/grazioli/eiont9697.pdf>]
- GRAZIOLI Riccardo 1997b. Preferential trees and anaphoric associations. Pavia: Università di Pavia. Ms.
- GRIMSHAW Jane & Vieri SAMEK-LODOVICI 1998. Optimal subjects and subject universals. In BARBOSA Pilar, Danny FOX, Paul HAGSTROM, Martha MCGINNIS & David PESETSKY (eds.). *Is the Best Good Enough? Optimality and Competition in Syntax*. Cambridge, MA: MIT Press. 193-220.
- GROSZ Barbara J. 1977. *The representation and use of focus in dialogue understanding*. Technical Report 151. Menlo Park, CA: SRI International.
- GROSZ Barbara J., Aravind K. JOSHI & Scott WEINSTAIN 1995. Centering: A framework for modeling the local coherence of discourse. *Computational Linguistics* 21. 203-225.
- GROSZ Barbara J. & Candace L. SIDNER 1986. Attentions, intentions and the structure of discourse. *Computational Linguistics* 12. 175-204.
- HAEGEMANN Liliane 1988. Parenthetical adverbials: the radical orphanage approach. In CHIBA Shuji, Akira OGAWA, Yasuaki FUIWARA, Norio YAMADA, Osamu KOMA & Takao YAGI (eds.). *Aspects of Modern English Linguistics: Papers Presented to Masatomo Ukaji on his 60th Birthday*. Tokyo: Kaitakushi. 232-254.
- HAJÍČOVÁ Eva 1987. Focussing. A meeting point of linguistics and artificial intelligence. In JORRAND PHILIPPE & VASIL SGUREV (eds.). *Artificial Intelligence II. Methodology, Systems, Applications*. Amsterdam: North-Holland. 311-321.
- HATCHER Anna Granville 1942. Tense-usage in the Roland. *Studies in Philology* XXXIX. 597-624.
- HELLMAN Christina & Östen DAHL 1994. Situational anaphora and the structure of discourse. In BOSCH Peter & Robert VAN DER SANDT (eds.). *Focus and Natural Language Processing*. Heidelberg: Institute for Logic and Linguistics, IBM Deutschland. 467-473.
- HIRSCHBERG Julia & Janet B. PIERREHUMBERT 1986. The intonational structuring of discourse. In *Proceedings of the 24th Annual Meeting of the Association for Computational Linguistics*. New York: Columbia University. 136-144.

- HITZEMAN Janet & Massimo POESIO 1998. Long distance pronominalisation and global focus. In *Proceedings of the 36th Annual Meeting of the Association for Computational Linguistics and of the 17th International Conference on Computational Linguistics*. Montreal: Université de Montréal. 550-556.
- HUDDLESTON Rodney & Geoffrey K. PULLUM 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.
- JAKOBSON Roman 1941. *Kindersprache, Aphasie und allgemeine Lautgesetze*. Uppsala: Almqvist.
- JOSHI Aravind K., Rashmi PRASAD & Eleni MILTSAKAKI 2006. Anaphora resolution: Centering theory approach. In BROWN KEITH (ed.). *Encyclopedia of Language & Linguistics*. Oxford: Elsevier. 223-230.
- KAMEYAMA Megumi 1998. Intracentential centering: A case study. In WALKER Marilyn, Aravind JOSHI & Ellen PRINCE (eds.). *Centering Theory in Discourse*. Oxford: Clarendon Press. 89-112.
- KAMEYAMA Megumi 1999. Stressed and unstressed pronouns: complementary preferences. In BOSCH P. & R. VAN DER SANDT (eds.). *Focus: Linguistic, Cognitive, and Computational Perspective*. Cambridge: Cambridge University Press. 306-321.
- KARTTUNEN Lauri 1976. Discourse referents. In MCCAWLEY JAMES (ed.). *Syntax and Semantics 7: Notes from the Linguistic Underground*. New York: Academic Press. 363-385.
- KEHLER Andrew 2002. *Coherence, Reference, and the Theory of Grammar*. Stanford, CA: CSLI.
- KIPARSKY Paul 2005. Where stochastic OT fails: a discrete model of metrical variation. In *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* (BLS 31). Berkeley: Berkeley Linguistics Society.
- KRULJFF-KORBAYOVÁ Ivana & Eva HAJIČOVÁ 1997. Topics and centers: a comparison of the salience-based approach and the Centering theory. *The Prague Bulletin of Mathematical Linguistics* 67. 25-50.
- LABOV William & Joshua WALETZKY 1967. Narrative analysis: Oral version of personal experience. In HELM JUNE (ed.). *Essays on the Verbal and Visual Arts: Proceedings of the 1966 Annual Spring Meeting of the American Ethnological Society*. Seattle: University of Washington. 12-44.
- LABOV William, Paul COHEN, Clarence ROBINS & John LEWIS 1968. *A Study of the Non-Standard English of Negro and Puerto Rican Speakers in New York City*. Vol 2. Washington, D.C.: Office of Education, U. S. Department of Health, Education and Welfare.
- LAKOFF George 1974. Syntactic amalgams. In *Papers from the 10th Regional Meeting of the Chicago Linguistic Society*. Chicago: Dept. of Linguistics, University of Chicago. 321-344.
- LIBERMAN Mark Y. 1975. *The Intonational System of English*. Cambridge, MA: MIT. PhD dissertation. Distributed by Indiana University Linguistic Club.
- LIBERMAN Mark Y. & Alan S. PRINCE 1977. On stress and linguistic rhythm. *Linguistic Inquiry* 8. 249-336.
- LUPERFOY Susann 1991. *Discourse Pegs: A Computational Analysis of Context-Dependent Referring Expressions*. Austin: The University of Texas. PhD dissertation.

- LUPERFOY Susann 1997. An implementation of DRT and File Change Semantics for interpretation of total and partial anaphora. Paper presented at the Second International Workshop on Computational Semantics (IWCS-II, February 1997). Tilburg. The Netherlands.
- MAES Alfons 1996. The markedness of *abstract-object* anaphors in discourse. *Belgian Journal of Linguistics* 10. 161-183.
- MATTIESSEN Christian & Sandra A. THOMPSON 1988. The structure of discourse and 'subordination'. In HAIMAN JOHN & SANDRA A. THOMPSON (eds.). *Clause Combining in Grammar and Discourse*. Amsterdam & Philadelphia: John Benjamins. 275-329.
- MCCARTHY John J. 1981. A prosodic theory of nonconcatenative morphology. *Linguistic Inquiry* 12. 373-418.
- MILTSAKAKI Eleni 2003. *The Syntax-Discourse Interface: Effects of the Main-Subordinate Distinction on Attentional Structure*. Philadelphia: University of Pennsylvania. PhD dissertation.
- MIRRER-SINGER Luise 1980. *The Language of Evaluation: a Sociolinguistic Approach to Narrative Structure in the 'Romancero del Rey Don Pedro' and in Pero Lopez de Ayala's 'Cronica del Rey Don Pedro'*. Stanford, CA: Stanford University. PhD dissertation.
- MITCHELL Terence F. 1957. The language of buying and selling in Cirenaica: a situational statement. *Hespéris* 44. 31-71. [Repr. in *Principles of Firthian Linguistics*. Longman: London. 1975. 167-200.]
- NOT Elena & Massimo ZANCANARO 1995. *Exploiting the discourse structure for anaphora generation*. Technical Report 9511-22. Povo (Trento): IRST.
- OTHERLE Richard 1981. Common problems in the theory of anaphora and the theory of discourse. In PARRET HERMAN, MARINA SBISA & JEF VERSCHUEREN (eds.). *Possibilities and Limitations of Pragmatics – Proceedings of the Conference on Pragmatics, Urbino, July 8-14, 1979*. Amsterdam: Benjamins. 509-530.
- PFLEGER Norbert 2004. Context based multimodal fusion. In *Proceedings of the Sixth International Conference on Multimodal Interfaces (ICMI'04)*. State College, PA. 265-272.
- PHILLIPS Colin 1996. *Order and Structure*. Cambridge, MA: MIT. PhD dissertation.
- PHILLIPS Colin 2003. Linear order and constituency. *Linguistic Inquiry* 34. 37-90.
- POESIO Massimo, Rosemarie STEVENSON, Barbara DI EUGENIO & Janet HITZEMAN 2004. Centering: a parametric theory and its instantiations. *Computational Linguistics* 30. 309-363.
- POLANYI Livia 1988. A formal model of discourse structure. *Journal of Pragmatics* 12. 601-638.
- POLANYI Livia, Chris CULY, Martin VAN DEN BERG, Gian Lorenzo THIONE & David AHN 2004. *Sentential structure and discourse parsing*. Report FXPAL-PR-285. Palo Alto: FX Palo Alto Laboratory.
- POLETTI Cecilia 1997. Pronominal syntax. In MAIDEN MARTIN & MAIR PARRY (eds.). *The Dialects of Italy*. London & New York: Routledge. 137-144.
- RIZZI Luigi 2006. *Criterial Freezing, EPP and Asymmetries*. Paris: EALing 2006 - École normale supérieure.

- ROSÉ Carolyn Penstein 1995. *The structure of multiple headed negotiations*. Pittsburgh: Computational Linguistics Program - Carnegie Mellon University. Ms.
- SAMEK-LODOVICI Vieri 1996. *Constraints on Subjects. An Optimality Theoretic Analysis*. New Brunswick: Rutgers University. PhD dissertation.
- SANSÒ Andrea 2006. 'Agent defocusing' revisited: Passive and impersonal constructions in some European languages. In ABRAHAM Werner & Larisa LEISIÖ (eds.), *Passivization and Typology - Form and Function*. Amsterdam & Philadelphia: Benjamins. 232-273.
- SCHLENKER Philippe 2005. *Minimize Restrictors!* (Notes on definite descriptions, Condition C and epithets). In MAIER Emar, Corien BARY & Janneke HUITINK (eds.), *Proceedings of SuB9*. Nijmegen: Nijmegen Centre of Semantics. 385-416.
- SELLS Peter 1985. *Restrictive and non-restrictive modification*. Technical Report CSLI-85-28. Stanford, CA: Center for the Study of Language and Information.
- SIDNER Candace L. 1979. *Towards a Computational Theory of Definite Anaphora Comprehension in English Discourse*. Cambridge, MA: MIT. PhD dissertation [MIT AI Technical Report 537].
- SIDNER Candace L. 1981. Focusing for interpretation of pronouns. *American Journal of Computational Linguistics* 7. 217-231.
- SIDNER Candace L. 1983. Focusing in the comprehension of definite anaphora. In BRADY MICHAEL & ROBERT C. BERWICK (eds.), *Computational Models of Discourse*. Cambridge, MA: MIT Press. 267-330.
- SIMENON Georges 1973. *Maigret et le corps sans tête*. Paris: Presses de la Cité.
- SIMENON Georges 1992. *Maigret e l'uomo senza testa*. Milano: Mondadori.
- SMITH Carlota S. 2003. *Modes of Discourse - The Local Structure of Texts*. Cambridge: Cambridge University Press.
- SURI Linda Z. 1992. *Using local focus to correct illegal NP omission*. Technical Report. Newark, DE: Dept. of Computer and Information Sciences, University of Delaware.
- TRECCI Alessandra 2003. *Distribuzione e referenza del pronome soggetto in italiano*. Roma: Università degli Studi di Roma Tre. Tesi di dottorato.
- VAN HOEK Karen 1995. Conceptual reference points: A cognitive grammar account of pronominal anaphora constraints. *Language* 71. 310-340.
- VAN HOEK Karen 1997. *Anaphora and Conceptual Structure*. Chicago: University of Chicago Press.
- WAHLSTER Wolfgang 2003. Towards symmetric multimodality: Fusion and fission of speech, gesture and facial expression. In GÜNTHER Andreas, Rudolf KRUSE & Bernd NEUMANN (eds.), *Proceedings of the 26th German Conference on Artificial Intelligence*. Berlin & Heidelberg: Springer. 1-18.
- WAHLSTER Wolfgang (ed.). 2006. *SmartKom: Foundations of Multimodal Dialogue Systems*. Heidelberg: Springer.
- WALKER Marilyn A. 2000. Vers un modèle de l'interaction du Centrage avec la structure globale du discours. *Verbum* 22. 31-58.
- WALKER Marilyn A., Aravind K. JOSHI & Ellen F. PRINCE (eds.). 1998. *Centering in Discourse*. Oxford: Clarendon Press.

- WEBBER Bonnie L. 1983. So what can we talk about now? In BRADY Michael & Robert C. BERWICK (eds.). *Computational Models of Discourse*. Cambridge, MA: MIT Press. 331-371.
- WEBBER Bonnie L. 1988. *Discourse deixis and discourse processing*. Technical Report No. MS-CIS-88-75 LINC LAB 133. Philadelphia: Department of Computer and Information Science - School of Engineering and Applied Science, University of Pennsylvania.
- WEBBER Bonnie L. 1991. Structure and ostension in the interpretation of discourse deixis. *Language and Cognitive Processes* 6. 107-135.
- WEBBER Bonnie L. & Dan CRISTEA 1997. Expectations in incremental discourse processing. In *Proceedings of the 35th Annual Meeting of the Association for Computational Linguistics and 8th Conference of the European Chapter of the Association for Computational Linguistics*. Madrid: UNED. 88-95.
- WEBBER Bonnie L., Matthew STONE, Aravind JOSHI & Alistair KNOTT 2003. Anaphora and discourse structure. *Computational Linguistics* 29. 545-587.
- WESTERGAARD Marit R. 1986. *Definite NP Anaphora: A Pragmatic Approach*. Oslo: Norwegian University Press.
- WIERZBICKA Anna 1974. The semantics of direct and indirect discourse. *Papers in Linguistics* 7. 267-308.
- WOLF Florian & Edward GIBSON 2006. *Coherence in Natural Language - Data Structures and Applications*. Cambridge, MA: MIT Press.
- YIP Moira, Joan MAILING & Ray JACKENDOFF 1987. Case in tiers. *Language* 63. 217-250.