A SYNTACTIC APPROACH TO DISCOURSE SEMANTICS

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ABSTRACT

A correct structural analysis of a discourse is a prerequisite for understanding it. This paper sketches the outline of a discourse grammar which acknowledges several different levels of structure. This grammar, the "Dynamic Discourse Model", uses an Augmented Transition Network parsing mechanism to build a representation of the semantics of a discourse in a stepwise fashion, from left to right, on the basis of the semantic representations of the individual clauses which constitute the discourse. The intermediate states of the parser model the intermediate states of the social situation which generates the discourse.

The paper attempts to demonstrate that a discourse may indeed be viewed as constructed by means of sequencing and recursive nesting of discourse constituents. It gives rather detailed examples of discourse structures at various levels, and shows how these structures are described in the framework proposed here.

I DISCOURSE STRUCTURES AT DIFFERENT LEVELS

If a discourse understanding system is to be able to assemble the meaning of a complex discourse fragment (such as a story or an elaborate description) out of the meanings of the utterances constituting the fragment, it needs a correct structural analysis of it. Such an analysis is also necessary to assign a correct semantic interpretation to clauses as they occur in the discourse; this is seen most easily in cases where this interpretation depends on phenomena such as the discourse scope of temporal and locative adverbials, the movement of the reference time in a narrative, or the interpretation of discourse anaphora.

The Dynamic Discourse Model, outlined in this paper, is a discourse grammar under development which analyses the structure of a discourse in order to be able to deal adequately with its semantic aspects. It should be emphasized at the outset that this system is a formal model of discourse syntax and semantics, but not a computer implementation of such a model.

For a system to be able to understand a discourse, it must be able to analyse it at several different levels.
1. Any piece of talk must be assigned to one Interaction -- i.e., to a socially constructed verbal exchange which has, at any moment, a well-defined set of participants.
2. Virtually every interaction is viewed by its participants as belonging to a particular pre-

defined genre -- be it a doctor-patient interaction, a religious ceremony, or a casual chat. Depending on the genre, certain participants may have specific roles in the verbal exchange, and there may be a predefined agenda specifying consecutive parts of the interaction. An interaction which is socially "interpreted" in such a fashion is called a Speech Event (Hymes,1967,1972).
3. A stretch of talk within one Speech Event may be characterized as dealing with one Topic.
4. Within a Topic, we may find one or more Discourse Units (DU's) -- socially acknowledged units of talk which have a recognizable "point" or purpose, while at the same time displaying a specific syntactic/semantic structure. Clear examples are stories, procedures, descriptions, and jokes.
5. When consecutive clauses are combined into one syntactic/semantic unit, we call this unit a discourse constituent unit (dcu). Examples are: lists, narrative structures, and various binary structures ("A but B", "A because B", etc.).
6. Adjacency Structures may well be viewed as a kind of dcu, but they deserve special mention. They are two or three part conversational routines involving speaker change. The clearest examples are question-answer pairs and exchanges of greetings.
7. The smallest units which we shall deal with at the discourse level are clauses and operators. Operators include "connectors" like "and", "or", "because", as well as "discourse markers" like "well", "so", "incidentally".

The levels of discourse structure just discussed are hierarchically ordered. For instance, any DU must be part of a Speech Event, while it must be built up out of dcu's. The levels may thus be viewed as an expansion of the familiar linguistic hierarchy of phoneme, morpheme, word and clause. This does not mean, however, that every discourse is to be analysed in terms of a five level tree structure, with levels corresponding to dcu, DU, Topic, Speech Event and Interaction.

To be able to describe discourse as it actually occurs, discourse constituents of various types must be allowed to be embedded in constituents of the same and other types. We shall see various examples of this in later sections. It is worth emphasizing here already that "high level constituents" may be embedded in "low level constituents". For instance, a dcu may be interrupted by a clause which initiates another Interaction. Thus, a structural description of the unfolding discourse would include an Interaction as embedded in the dcu. In

this way, we can describe "intrusions", "asides to third parties", and other interruptions of one Interaction by another.

In the description of discourse semantics, the level of the dcu's (including the adjacency structures) plays the most central role: at this level the system defines how the semantic representation of a complex discourse constituent is constructed out of the semantic representations of its parts. The other levels of structure are also of some relevance, however:
- The Discourse Unit establishes higher level semantic coherence. For instance, the semantics of different episodes of one story are integrated at this level.
- The Topic provides a frame which determines the interpretation of many lexical items and descriptions.
- The Speech Event provides a script which describes the conventional development of the discourse, and justifies assumptions about the purposes of discourse participants.
- The Interaction specifies referents for indexicals like "I", "you", "here", "now".

II   THE DYNAMIC DISCOURSE MODEL

Dealing with linguistic structures above the clause level is an enterprise which differs in an essential way from the more common variant of linguistic activity which tries to describe the internal structure of the verbal symbols people exchange. Discourse linguistics does not study static verbal objects, but must be involved with the social process which produces the discourse -- with the ways in which the discourse participants manipulate the obligations and possibilities of the discourse situation, and with the ways in which their talk is constrained and framed by the structure of this discourse situation which they themselves created. The structure one may assign to the text of a discourse is but a reflection of the structure of the process which produced it.

Because of this, the Dynamic Discourse Model that we are developing is only indirectly involved in trying to account for the a posteriori structure of a finished discourse; instead, it tries to trace the relevant states of the social space in terms of which the discourse is constructed. This capability is obviously of crucial importance if the model is to be applied in the construction of computer systems which can enter into actual dialogs.

The Dynamic Discourse Model, therefore, must construct the semantic interpretation of a discourse on a clause by clause basis, from left to right, yielding intermediate semantic representations of unfinished constituents, as well as setting the semantic parameters whose values influence the interpretation of subsequent constituents.

A syntactic/semantic system of this sort may very well be fromulated as an Augmented Transition Network grammar (Woods, 1970), a non-deterministic parsing system specified by a set of transition networks which may call each other recursively. Every Speech Event type, DU type and dcu type is associated with a transition network specifying its internal structure. As a transition network pro-

cesses the consecutive constituents of a discourse segment, it builds up, step by step, a representation of the meaning of the segment. This representation is stored in a register associated with the network. At any stage of the process, this register contains a representation of the meaning of the discourse segment so far.

An ATN parser of this sort models important aspects of the discourse process. After each clause, the system is in a well-defined state, characterized by the stack of active transition networks and, for each of them, the values in its registers and the place where it was interrupted. When we say that discourse participants know "where they are" in a complicated discourse, we mean that they know which discourse constituent is being initiated or continued, as well as which discourse constituents have been interrupted where and in what order -- in other words, they are aware of the embedding structure and other information captured by the ATN configuration.

The meaning of most clause utterances cannot be determined on the basis of the clause alone, but involves register values of the embedding dcu -- as when a question sets up a frame in terms of which its answer is interpreted (cf. Scha, 1983) or when, to determine the temporal reference of a clause in a narrative, one needs a "reference time" which is established by the foregoing part of the narrative (section III B 2). From such examples, we see that the discourse constituent unit serves as a framework for the semantic interpretation of the clauses which constitute the text. By the same token, we see that the semantics of an utterance is not exhaustively described by indicating its illocutionary force and its propositional content. An utterance may also cause an update in one or more semantic registers of the dcu, and thereby influence the semantic interpretation of the following utterances.

This phenomenon also gives us a useful perspective on the notion of interruption which was mentioned before. For instance, we can now see the difference between the case of a story being interrupted by a discussion, and the superficially similar case of a story followed by a discussion which is, in its turn, followed by another story. In the first case, the same dcu is resumed and all its register values are still available; in the second case, the first story has been finished before the discussion and the re-entry into a storyworld is via a different story. The first story has been closed off and its register values are no longer avilable for re-activation; the teller of the second story must re-initialize the variables of time, place and character, even if the events of the second story concern exactly the same characters and situations as the first.

Thus, the notions of interruption and resumption have not only a social reality which is experienced by the interactants involved. They also have semantic consequences for the building and interpretation of texts.

Interruption and resumption are often explicitly signalled by the occurrence of "discourse markers". Interruption is signalled by a PUSH-marker such as "incidentally", "by the way", "you know" or "like". Resumption is signalled by a POP-

-markers such as "O.K.", "well", "so" or "anyway".
(For longer lists of discourse marking devices, and
somewhat more discussion of their functioning, see
Reichman (1981) and Polanyi and Scha(1983b).)

In terms of our ATN description of discourse
structure, the PUSH- and POP-markers do almost ex-
actly what their names suggest. A PUSH-marker sig-
nals the creation of a new embedded discourse con-
stituent, while a POP-marker signals a return to an
embedding constituent (though not necessarily the
immediately embedding one), closing off the cur-
rent constituent and all the intermediate ones. The
fact that one POP-marker may thus create a whole
cascade of discourse-POPs was one of Reichman's
(1981) arguments for rejecting the ATN model of dis-
course structure. We have indicated before, however,
that accommodating this phenomenon is at worst a
matter of minor technical extensions of the ATN for-
malism (Polanyi and Scha, 1983b); in the present
paper, we shall from now on ignore it.

III   DISCOURSE CONSTITUENT UNITS

A. Introduction.

This section reviews some important ways in
which clauses (being our elementary discourse con-
stituent units) can be combined to form complex
discourse constituent units (which, in most cases,
may be further combined to form larger dcu's, by
recursive application of the same mechanisms). For
the moment, we are thus focussing on the basic dis-
course syntactic patterns which make it possible to
construct complex discourses, and on the semantic
interpretation of these patterns. Sections IV and V
will then discuss the higher level structures, where
the interactional perspective on discourse comes
more to the fore.

To be able to focus on discourse level phe-
nomena, we will assume that the material to be dealt
with by the discourse grammar is a sequence con-
sisting of clauses and operators (connectors and
discourse markers). It is assumed that every clause
carries the value it has for features such as speak-
er, clause topic, propositional content (represented
by a formula of a suitable logic), preposed consti-
tuents (with thematic role and semantics), tense,
mood, modality. (The syntactic features we must
include here have semantic consequences which can
not always be dealt with within the meaning of the
clause, since they may involve discourse issues.)

The semantics of a dcu is built up in par-
allel with its syntactic analysis, by the same re-
cursive mechanism. When clauses or dcu's are com-
bined to form a larger dcu, their meanings are com-
bined to form the meaning of this dcu. Along with
registers for storing syntactic features and seman-
tic parameters, each dcu has a register which is
used to build up the logical representation of its
meaning.

Since the syntactic and semantic rules op-
erate in parallel, the syntactic rules have the
possibility of referring to the semantics of the
constituents they work on. This possibility is in
fact used in certain cases. We shall see an example
in section III C 1.

Complex discourse constituent units can be
divided into four structurally different types:

- sequences, which construct a dcu out of arbitrar-
  ily many constituents (e.g.: lists, narratives).
- expansions, consisting of a clause and a subordi-
  nated unit which "expands" on it.
- structures formed by a binary operator, such as
       "A because B", "If A then B".
- adjacency structures, involving speaker change,
  such as question/answer pairs and exchanges of
  greetings.

In the next subsections, III B and III C,
we shall discuss sequences and expansions in more
detail. One general point we should like to make
here already: sequences as well as expansions cor-
respond to extensional semantic operations. The
propositions expressing the meanings of their con-
stituents are evaluated with respect to the same
possible world -- the successive constituents sim-
ply add up to one description. (We may note that
some of the binary structures which we shall not
consider further now, certainly correspond to in-
tensional operations. "If A then B" is a clear ex-
ample.)

Since we will not discuss adjacency struc-
tures in any detail in this paper, the problem of
accommodating speaker change and different illocu-
tionary forces in the discourse semantics will be
left for another occasion.

B. Sequential Structures.

We shall discuss three kinds of sequential
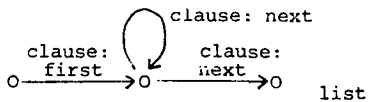structures: lists, narratives, and topic chaining.

1. Lists.

Perhaps the paradigmatic sequential
structure is the list: a series of clauses $C_1, \ldots,$
C_k, which have a semantic structure of the form
     $F(a_1) = v_1, \ldots, F(a_k) = v_k,$
i.e., the clauses express propositions which con-
vey the values which one function has for a series
of alternative arguments. For instance, when asked
to describe the interior of a room, someone may
give an answer structured like this:
   "When I come into the door,
     then I see,
        to the left of me on the wall, a large win-
        dow (...).
        Eh, the wall across from me, there is a eh
        basket chair (...).
        On the right wall is a mm chair (...).
        In the middle of the room there is, from left
        to right, an oblong table, next to that a
        round table, and next to that a tall cabinet.
     Now I think I got everything."
(Transcript by Ehrich and Koster (1983), translated
from Dutch; the constituents we left out, indicated
by parenthesized dots, are subordinated consti-
tuents appended to the NP they follow.)
The list here occurs embedded under the phrase "I
see", and is closed off by the phrase "Now I think
I got everything".

Often, the successive arguments in a
list are mentioned in a non-random order -- in the
above case, for instance, we first get the loca-
tions successively encountered in a "glance tour"
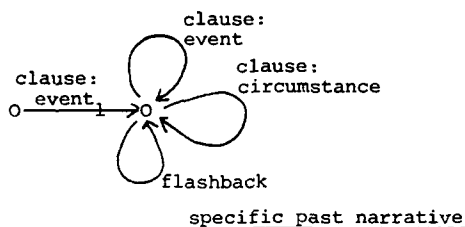from left to right along the walls; then the rest.

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The ATN description of lists is very simple*:

```
              clause: next
              ___
             /   \
clause:     |  ↙  |  clause:
  first      \   /     next
o————————→o————————→o
```
                                    list

Both the first and the next arc parse clauses which
must have the semantic structure F(a) = v. (Whether
a clause can be analysed in this fashion, depends
on surface properties such as stress pattern and
preposing of constituents.) Various registers are
set by the first clause and checked when next
clauses are parsed, in order to enforce agreement
in features such as tense, mood, modality. The se-
mantics of a new clause being parsed is simply
conjoined with the semantics of the list so far.

2. Narratives.

Narratives may be seen as a special case
of lists -- successive event clauses specify what
happens at successive timepoints in the world de-
scribed by the narrative. Narratives are subdivided
into different genres, marked by different tense
and/or person orientation of their main line
clauses: specific past time narratives (marked by
clauses in the simple past, though clauses in the
"historical present" may also occur), generic past
time narratives (marked by the use of "would" and
"used to"), procedural narratives (present tense),
simultaneous reporting (present tense), plans (use
of "will" and "shall"; present tense also occurs).
We shall from now on focus on specific past narra-
tives. The properties of other narratives turn out
to be largely analogous. (Cf. Longacre (1979) who
suggests treating the internal structure of a dis-
course constituent and its "genre specification" as
two independent dimensions.)

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                    clause:
                    event
clause:                       clause:
  event₁                      circumstance
o————————→o
                    flashback
```

specific past narrative

All clause-processing arcs in this network
for "specific past narratives" require that the
tense of the clause be present or simple past. The
event arc and the event₁ arc process clauses with a
non-durative aspect. The circumstance arc processes
clauses with a durative aspect. (The aspectual ca-
tegory of a clause is determined by the semantic
categories of its constituents. Cf. Verkuyl, 1972.)
The event₁ arc is distinguished because it initial-
izes the register settings.

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* Notation: All diagrams in this paper have one ini-
tial state (the leftmost one) and one final state
(the rightmost one). The name of the diagram indi-
cates the category of the constituent it parses.
Arcs have labels of the form "A:B" (or sometimes
just "A"), where A indicates the category of the
constituent which must be parsed to traverse the
arc, and B is a label identifying additional con-
ditions and/or actions.

The specific past narrative network has a
time register containing a formula representing
the current reference time in the progression of
the narrative. When the time register has a value
t, an incoming circumstance clause is evaluated at
t, and it does not change the value of the time re-
gister. An event clause, however, is evaluated with
respect to a later but adjacent interval t', and
resets the time register to an interval t", later
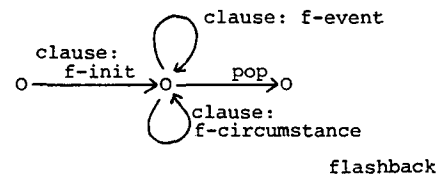than but adjacent to t'. (Cf. Polanyi and Scha, 1981)

To show that this gives us the desired
semantic consequences, we consider an abbreviated
version of a detective story fragment, quoted by
Hinrichs (1981):
(E1) He went to the window
(E2) and pulled aside the soft drapes.
(C1) It was a casement window
(C2) and both panels were cranked down to let in
      the night air.
(E3) "You should keep this window locked," he said.
(E4) "It's dangerous this way."
The E clauses are events, the C clauses are circum-
stances. The events are evaluated at disjoint, suc-
cessively later intervals. The circumstances are
evaluated at the same interval, between E2 and E3.

To appreciate that the simultaneity of
subsequent circumstance clauses in fact is a con-
sequence of aspectual class rather than a matter of
"world knowledge", one may compare the sequence
"He went to the window and pulled aside the soft
drapes" to the corresponding sequence of circum-
stance clauses: "He was going to the window and
was pulling aside the soft drapes". World knowledge
does come in, however, when one has to decide how
much the validity of a circumstance clause extends
beyond the interval in the narrative sequence where
it is explicitly asserted.

Specific past narratives may also con-
tain other constituents than clauses. An important
case in point is the "flashback" -- an embedded nar-
rative which relates events taking place in a peri-
od before the reference time of the main narrative.
A flashback is introduced by a clause in the plu-
perfect; the clauses which continue it may be in
the pluperfect or the simple past.

```
                    clause: f-event
clause:
  f-init              pop
o————————→o————————→o
                  clause:
                  f-circumstance
```

flashback

The first clause in a flashback (f-init)
is an event clause; it initializes register set-
tings. The reference time within a flashback moves
according to the same meachanism sketched above for
the main narrative line.

After the completion of a flashback, the
main narrative line continues where it left off --
i.e., it proceeds from the reference time of the
main narrative. A simple example:

Peter and Mary left the party in a hurry.
   Mary had ran into John
   and she had insulted him.
So they got into the car
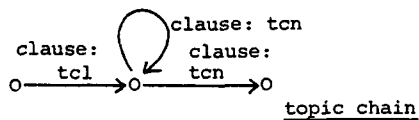and drove down Avenue C.

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3. Topic Chaining

Another sequential structure is the topic chaining structure, where a series of distinct predications about the same argument are listed. A topic chain consists of a series of clauses $C_1, ..., C_k$, with a semantic structure of the form $P_1(a), ..., P_k(a)$, where "a" translates the topic NP's of the clauses. In the first clause of the chain, the topic is expressed by a phrase (either a full NP or a pronoun) which occurs in subject position or as a preposed constituent. In the other clauses, it is usually a pronoun, often in subject position. An example:

Wilbur's book I really liked.
It was on relativity theory
and talks mostly about quarks.
I got it while I was working on the initial part
of my research.
       (Based on Sidner (1983), example D26.)

The topic chain may be defined by a very simple transition network.

topic chain

The network has a topic register, which is set by the first clause (parsed by the tcl arc), which also sets various other registers. The tcn arc tests agreement in the usual way. As for the topic register, we require that the clause being parsed has a constituent which is interpreted as co-referential with the value of this register. The semantics of a topic chain is created by simple conjunction of the semantics of subsequent constituents, as in the case of the list.

Lists, narratives and topic chains differ as to their internal structure, but are distributionally indistinguishable -- they may occur in identical slots within larger discourse constituents. For an elegant formulation of the grammar, it is therefore advantageous to bring them under a common denominator: we define the notion sequence to be the union of list, narrative and topic chain.

C. Expansions.

Under the heading "expansions" we describe two constructions in which a clause is followed by a unit which expands on it, either by elaborating its content ("elaborations") or by describing properties of a referent introduced by the clause ("topic-dominant chaining").
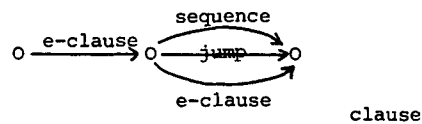
1. Elaborations.

A clause may be followed by a dcu (a clause or clause sequence) which expands on its content, i.e. redescribes it in more detail. For instance, an event clause may be expanded by a mini-narrative which recounts the details of the event. An example:

Pedro dined at Madame Gilbert's.
   First there was an hors d'oeuvre.
   Then the fish.
   After that the butler brought a glazed chicken.
   The repast ended with a flaming dessert...

The discourse syntax perspective suggests that in a case like this, the whole little narrative must be viewed as subordinated to the clause which precedes it. We therefore construct one dcu which consists of the first clause plus the following sequence.

An illustration of the semantic necessity of such structural analyses is provided by the movement of the reference time in narratives. The above example (by H. Kamp) appeared in the context of the discussion about that phenomenon. (Cf. Dowty, 1982) Along with other, similar ones, it was brought up as complicating the idea that every event clause in a narrative moves the reference time to a later interval. We would like to suggest that it is no coincidence that such "problematic" cases involve clause sequences belonging to known paragraph types, and standing in an elaboration relation to the preceding clause. The reason why they interrupt the flow of narrative time is simple enough: their clauses are not direct constituents of the narrative at all, but constitute their own embedded dcu.

To describe elaborations, we redefine the notion of a clause to be either an elementary one or an elaborated one (where the elaboration can be constituted by a sequence or by a single clause).
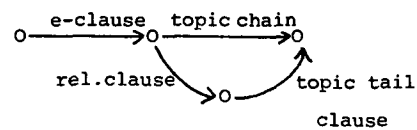

clause

If a clause C is followed by a dcu D, D may be parsed as an elaboration of C, if C and D may be plausibly viewed as describing the same situation. (Note that this is a relation not between the surface forms of C and D, but between their meanings C' and D'.) When constructing the semantics for the complex clause, this semantic coherence must also be made explicit.

2. Topic-Dominant Chaining.

Another phenomenon which gives rise to a similar structure is "topic-dominant chaining". Within a clause with a given topic, certain other constituents may be identified as possibly dominant*. A dominant constituent may become the topic of the next clause or sequence of clauses. We suggest that such a continuation with a new topic be seen as expanding on the clause before the topic-switch, and as syntactically subordinated to this clause. This subordinated constituent may either be a single clause or another topic chain sequence.

Similarly, a clause may be followed by a relative clause, the relative pronoun referring to a dominant constituent of the embedding clause. Also in this case, the relative clause may be the first clause of an embedded topic chain.

clause

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* The notion of dominance links discourse phenomena with extraction phenomena within the sentence. See, e.g., Erteschik-Shir and Lappin (1979).

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(We thus introduce an alternative network for clause into the grammar, in addition to the one given before.)

The dominant constituents of the e-clause are stored in a register; the topic of the topic chain, as well as the relative pronoun of the rel. clause must be interpreted as coreferential with one of those constituents. The topic of topic tail (a "headless" topic chain) must in its turn corefer with the relative pronoun.

The semantics consists of simple conjunction.

Both variants of topic-dominant chaining allowed by the above network are exemplified in the following text (Sidner, 1983; example D26):

(1) Wilbur is a fine scientist and a thoughtful guy.
(2) He gave me a book a while back
(2')   which I really liked.
(3)   It was on relativity theory
(4)   and talks mostly about quarks.
(5)   They are hard to imagine
(6)   because they indicate the need for elementary field theories of a complex nature.
(7)   These theories are absolutely essential to all relativity research.
(8)   Anyway
(8') I got it
(8")   while I was working on the initial part of my research.
(9) He's a really helpful colleague to have thought of giving it to me.

(Indentation indicates subordination with respect to the most recent less indented clause.) This embedding of constituents by means of topic-dominant chaining would explain the "focus-stack" which Sidner (1983) postulates to describe the pronominal reference phenomena in examples like this.
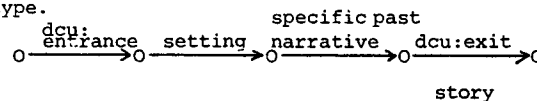
IV DISCOURSE UNITS

We now leave the discussion of the basic syntactic/semantic mechanisms for building discourse out of clauses, and turn to the higher levels of analysis, where considerations involving the goals of the interaction start to come in. First of all, we shall discuss the entities which Wald (1978) calls Discourse Units*, corresponding closely to the entities which Longacre (1983) simply calls "Discourses". Discourse Units (DU's) are socially acknowledged units of talk, which have a recognizable point or purpose, and which are built around one of the sequential dcu's discussed in section III B.

Discourse Unit types which have been investigated include stories (Labov, 1972; Wald, 1978; Polanyi, 1978b), descriptions of various sorts (Linde, 1979; Ehrich and Koster, 1983), procedural discourse and hortatory discourse (see various references in Longacre (1983)).

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* Wald restricts his notion to monologic discourse fragments. It seems reasonable to generalize it to cases where more than one speaker may be involved.

Because of the pragmatic relation between the Discourse Unit and the surrounding talk (specifically, the need to appear "locally occasioned" (Jefferson, 1979) and to make a "point" (Polanyi, 1978b), the central part of the Discourse Unit usually is not a piece of talk standing completely on its own feet, but is supported by one or more stages of preparatory and introductory talk on one end, and by an explicit closure and/or conclusion at the other. This may be illustrated by taking a closer look at conversationally embedded stories -- the paradigmatic, and most widely studied, DU type.

dcu: specific past
   entrance setting narrative dcu:exit
O————→O————→O————→O————→O

story

A typical story is initiated with entrance talk which sets the topic and establishes the relation with the preceding talk. Often we find an abstract, and some kind of negotiation about the actual telling of the story.

Then follows the "setting" which gives the necessary background material for the story*. Then follows the "core": a specific past narrative, relating a sequence of events. The story is concluded with "exit talk" which may formulate the point of the story quite explicitly, connecting the storyworld with more general discourse topics.

For instance, one story in Labov's (1972) collection has as its entrance talk an explicit elicitation and its response to it:
   Q: What was the most important fight that you remember, one that sticks in your mind...
   A: Well, one (I think) was with a girl.
There is an extensive section describing the setting: "Like I was a kid you know. And she was the baddest girl, the baddest girl in the neighborhood. If you didn't bring her candy to school, she would punch you in the mouth; and you had to kiss her when she'd tell you. This girl was only twelve years old, man, but she was a killer. She didn't take no junk; she whupped all her brothers."
Then, the event chain starts, and finally ends: "And I came to school one day and I didn't have any money. (....) And I hit the girl: powwww! and I put something on it. I win the fight."
The story is explicitly closed off: "That was one of the most important."

Not every specific past narrative may be the core of a story. Because of the interactional status of the story (its requirement to be "pointful") there are other properties which are noticeable in the linguistic surface structure -- notably the occurrence of "evaluation" (Polanyi, 1978b) and of a "peak" in the narrative line (Longacre, 1983).
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* That the necessary background material must be given before the actual event sequence, is attested by a slightly complicated storytelling strategy, described in Polanyi (1978a) as the "True Start" repair: the storyteller first plunges right into the event sequence, then breaks off the narrative line and restarts the telling of the story, now with the insertion of the proper background data.

The structural description of stories, given above, should probably be further elaborated to account for the phenomenon of episodes: a story may be built by consecutive pieces of talk which constitute separate narrative dcu's. At the level of the story DU, the meanings of these narratives must be integrated to form a description of one storyworld rather than many.

In English and other Western European languages, the Discourse Unit seems to be a largely interactional notion. Its constituents are pieces of talk defined by the independently motivated dcu-grammar. The DU grammar only imposes constraints on the content-relations between its constituent dcu's; it does not define structures which an adequate dcu grammar would not define already. In other languages of the world, the situation seems to be somewhat different: there are syntactically defined ways for building DU's out of dcu's, which were not already part of the dcu grammar. For details, one should investigate, for instance, the various works referred to in Longacre (1983). Also in this body of work, however, one can find numerous cases where the structural difference between a DU ("Discourse", in Longacre's terms) and the corresponding sequential dcu ("paragraph", in his terms) is not very clear.

V INTERACTIONS AND SPEECH EVENTS

The system we present here is intended to analyze the verbal material occurring in one Interaction. By an Interaction we mean a social situation in which a set of participants is involved in an exchange of talk. Each of the participants knows to be taking part in this situation, and assigns to the others the same awareness. By focussing on one interaction, we single out, from all the talk that may be going on at one place at the same time, the talk which belongs together because it is intended to be part of the same social situation. (Cf. Goffman, 1979)

The set of participants of an Interaction determines the possible speakers and addressees of the talk occurring in it. Similarly, the physical time and place of an interaction provide the referents for indexicals like "now" and "here".
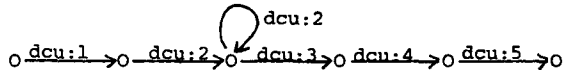
A simple two person Interaction would be described as an exchange of greetings, followed by a piece of talk as defined by a lower level of the grammar, followed by an exchange of farewells. Greetings and farewells are the only kinds of talk which directly engage the Interaction level of description -- they correspond to signing on and signing off to the list of participants.

An "unframed" interaction between "uninterpreted" people is a rare event. People use a refined system of subcategorization to classify the social situations they engage in. These subcategories, which we shall call Speech Event types (cf. Hymes, 1967, 1972), often assign a specific purpose to the interaction, specify roles for the participants, constrain discourse topics and conversational registers, and, in many cases, specify a conventional sequence of component activities.

The most precisely circumscribed kinds of Speech Events are formal rituals. Speech Event types characterized by grammars which are less explicit and less detailed include service encounters (Merritt, 1978), doctor-patient interactions (Byrne and Long, 1976), and casual conversations.

The structure of talk which is exchanged in order to perform a task will follow the structure of some goal/subgoal analysis of this task (Grosz, 1977). In Speech Event types which involve a more or less fixed goal, this often leads to a fixed grammar of subsequent steps taken to attain it. For instance, students looking at transcripts of the ongoings in a Dutch butchershop, consistently found the following sequential structure in the interaction between the butcher and a customer:
1. establishing that it is this customer's turn.
2. the first desired item is ordered, and the order is dealt with,....., the n-th desired item is ordered and the order is dealt with.
3. it is established that the sequence of orders is finished.
4. the bill is dealt with.
5. the interaction is closed off.

$$o \xrightarrow{\text{dcu:1}} o \xrightarrow{\text{dcu:2}} o \xrightarrow{\text{dcu:3}} o \xrightarrow{\text{dcu:4}} o \xrightarrow{\text{dcu:5}} o$$

butchershop interaction

Each of these steps is filled in in a large variety of ways -- either of the parties may take the initiative at each step, question/answer sequences about the available meat, the right way to prepare it, or the exact wishes of the customer may all be embedded in the stage 2 steps, and clarification dialogs of various sorts may occur. In other words, we find the whole repertoire of possibilities admitted by the dcu grammar (particularly, the part dealing with the possible embeddings of adjacency structures within each other).

Thus, we note that the arcs in a Speech Event diagram such as the above do not impose syntactic constraints on the talk they will parse. The labels on the arcs stand for conditions on the content of the talk -- i.e., on the goals and topics that it may be overtly concerned with.

An important Speech Event type with characteristics slightly different from the types mentioned so far, is the "casual conversation". In a casual conversation, all participants have the same role: to be "equals"; no purposes are pre-established; and the range of possible topics is open-ended, although conventionally constrained.

VI INTERRUPTION REVISITED

One Speech Event type may occur embedded in another one. It may occupy a fixed slot in it, as when an official gathering includes an informal prelude or postlude, where people don't act in their official roles but engage in casual conversation. (Goffman, 1979) Or, the embedding may occur at structurally arbitrary points, as when a Service Encounter in a neighborhood shop is interrupted for smalltalk.

The latter case may be described by tacitly adding to each state in the Service Encounter network a looping arc which PUSHes to the Casual

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