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USING COMPUTER PROGRAMS TO TEST LINGUISTIC MODELS: AN ATTEMPT AT A MODAL ALGORITHM

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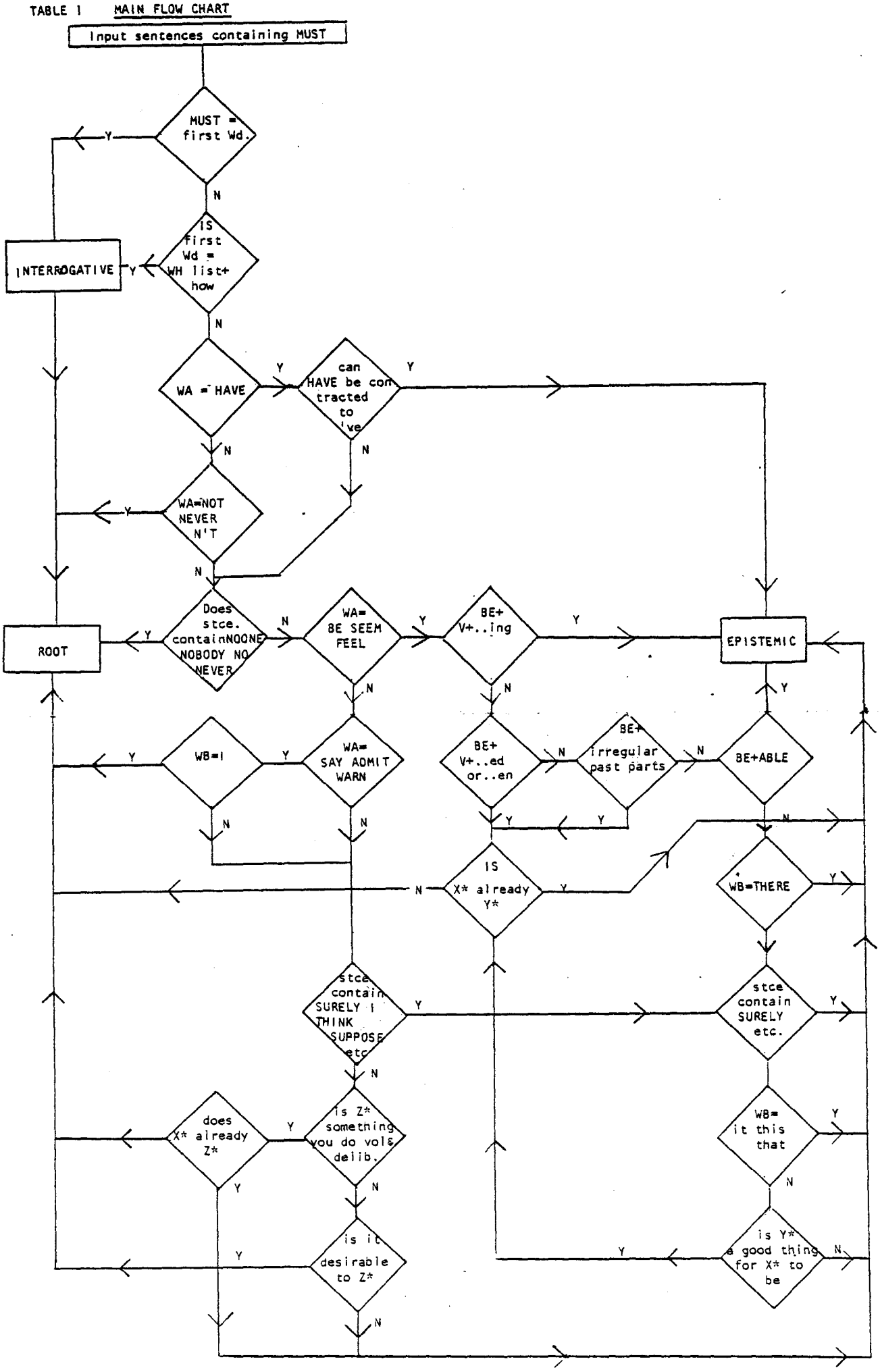
1. Neither models which assume discrete categories, nor those which assume fuzziness, are wholly satisfactory for an analysis of modal meaning. On the one hand, it appears that the root/epistemic distinction is a discrete one and this claim is supported by (i) the existence of ambiguous cases, where the two meanings are in an either/or relationship; (ii) the co-occurrence of the two categories, root and epistemic, with distinct syntactic and semantic features, such as negation, aspect, etc.; (iii) the possibility of distinct paraphrases. On the other hand, it seems that the root category is fuzzy: that is, it typically exhibits gradience, with cases being assignable to one end or other of a cline, or to some intermediate point. Examination of corpus data confirms this view (Coates and Leech, 1979), and the analysis of this data has led to the conclusion that a correct description of modal meaning must reconcile categorical and non-categorical approaches (Leech and Coates, 1980).

2.1 As an exercise in clarifying these ideas, it was decided to try and get this fuzzy-cum-discrete model down on paper. Here we will discuss the algorithm we worked on for MUST. MUST has the advantage of involving only two meanings, root and epistemic, unlike, for example, SHOULD, which can be used as a quasi-subjunctive and as a first-person variant of WOULD, besides its root and epistemic meanings. Once we felt this algorithm was in a reasonable state, the flow chart was drawn (see Table 1). This assumes an input to sentences containing MUST, which will be assigned to one of the two end-points, ROOT and EPISTEMIC. The sentence is then processed by the relevant paraphrase subroutine and output in its new form.

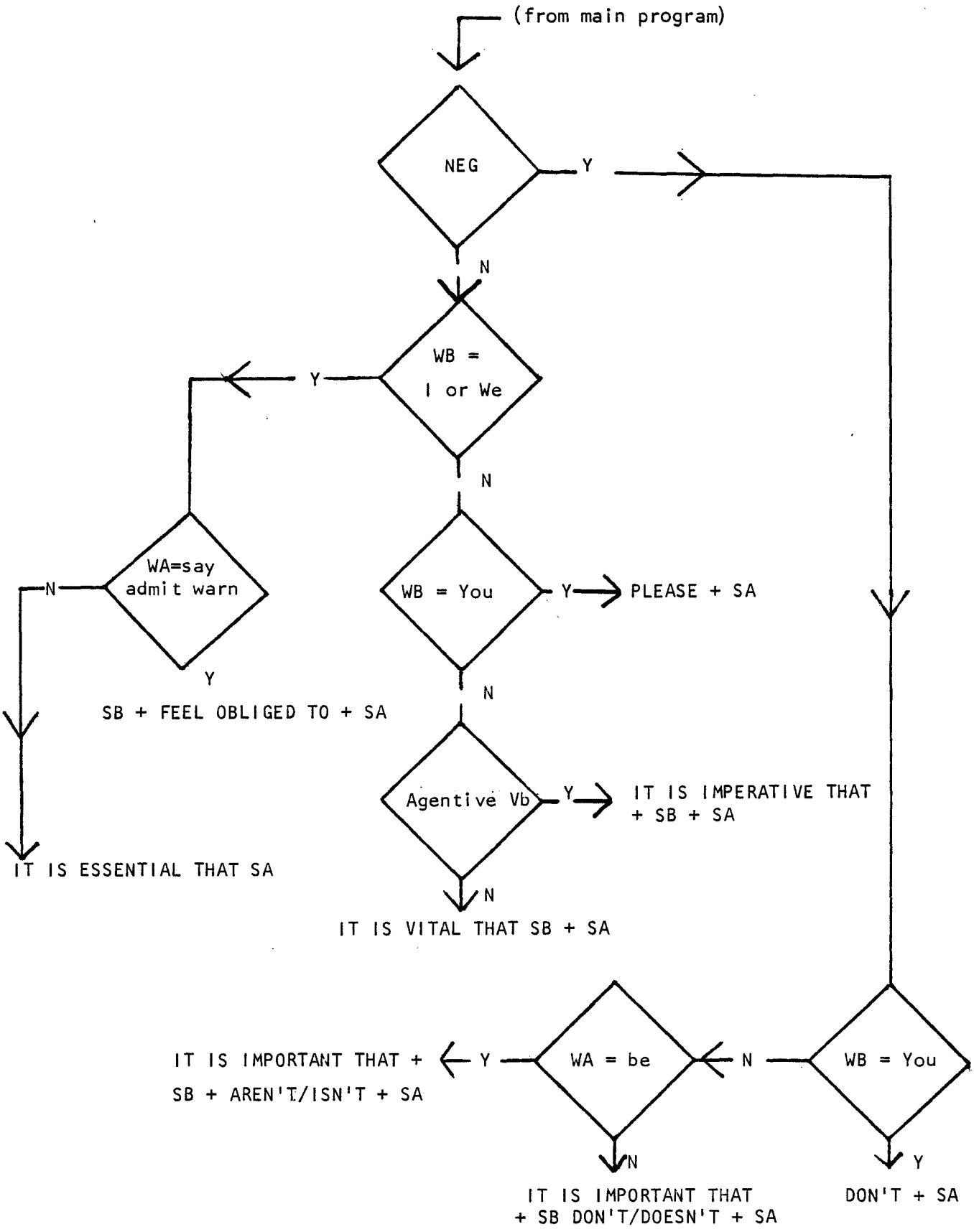
2.2 As anyone familiar with flow charts will see, the output is not arrived at automatically in all cases. Because the program lacks knowledge of the English language and knowledge of the world, it will sometimes need to ask for extra information in order to interpret MUST. This will involve interacting with the user (the person inputting the sentence) via the video screen (see 3.1 below). For example, the decision point 'is Z = string after MUST something you do voluntarily and deliberately?' is designed to elicit from the user whether an agentive verb is present. If the user responds with 'Yes', then the string Z is stored as data for future reference; that is, to a certain limited extent, our program is heuristic. This leads to greater efficiency, as the next time MUST + Z is input, the program will be able to deal with this decision point without consulting the user. (It is therefore necessary at this point in the program to avoid storing words, such as KNOW, HAVE, REMEMBER, which can be used both as statives and as agentives.)

TABLE 1 MAIN FLOW CHART



*X=string before MUST,Y=string after MUST BE,Z=string after MUST, WA=word after MUST,WB=word before MUST.

Table 2 ROOT PARAPHRASE



SB = STRING BEFORE MUST
SA = STRING AFTER MUST
WB = WORD BEFORE MUST

This interactive element can be further illustrated by looking at cases where MUST is followed by HAVE. The program will 'ask': 'Can HAVE be contracted to 'VE?' This question is designed to elicit from the user phonological information which will enable the program to interpret HAVE as an auxiliary or a full verb. If the user answers 'yes', or if the sentence is input in the form MUST'VE, then the word following HAVE/'VE is stored. In this way a list of past participles is built up which enables the program subsequently to interpret MUST HAVE without interaction with the user, because MUST + HAVE + past participle is perfective and therefore epistemic.

This heuristic element has other advantages. The program is able to generalise its knowledge of past participles and apply it to an interpretation of passives. For example, the interactive decision-point 'Is X already Y?' (where X = string before MUST, and Y = string after MUST BE) is designed to distinguish between passives (BE + past participle) and copulatives (BE + adjective). However, if the string following MUST BE had already been stored by the program as a past participle, then this decision-point can be passed without involving the user. The program needs to check its store of past participles against the set of ambiguous words (such as TIRED, WORN (OUT), etc.) which function both as past participles and as adjectives.

2.3 To illustrate the working of the flow-chart, let us take the following input sentence:

(1) <u>You must get ready for school</u>

and monitor its progress through the flow-chart, taking one decision-point (diamond) at a time.

i) First word = MUST? No.
ii) First word = WH-word? No.
(i and ii identify interrogative sentences, see 2.6.2)
iii) WA (word after) = HAVE? No.
(Preparatory question in identifying perfective aspect)
iv) WA = NOT, N'T, NEVER? No.
v) Sentence contains NO ONE, NOBODY, NO etc? No.
vi) WA = BE, SEEM, FEEL? No.
(Identifies the most common copulas)
vii) WA = SAY, ADMIT, WARN? No.
(Picks up expressions of the type "Well, I must say ...")
viii) Sentence contains SURELY, I THINK, I SUPPOSE etc? No.
(Identifies words/strings associated with epistemic usage, see 2.6.1)
ix) 'Is <u>get ready for school</u> something you do voluntarily and deliberately? Yes.
(This question will appear on the screen and the user will type in the appropriate response)

x) 'Are you getting ready for school at the moment of speaking?' No.
xi) ROOT end point.

The sentence is now paraphrased and the output will be:

(1a) A paraphrase for this sentence would be Please get ready for school.

2.4 One of the things this algorithm claims to model is the discrete nature of the root/epistemic distinction. It will interpret every sentence input as either root or epistemic, and will therefore fail to detect ambiguity. Its ability to distinguish root and epistemic usage is demonstrated by its handling of Halliday's (1970) miminal pair:

You must be very careful
You must be very careless

Examples from this point onwards will monitor the progress of a sentence through the flow-chart. Comments will be added as necessary in square brackets.

(2) Pet: Type in a sentence containing MUST
User: You must be very careful
This sentence will reach the decision-point 'Word after = BE?', which it will pass, then fail at all decision-points until:
Pet: Is very careful a good thing for you to be?
User: Yes
Pet: Are you already very careful?
User: No
Note that this question relates to the speakers world-view at the moment of speaking, not to any absolute truth. The command You must be very careful can only be given if the speaker believes that the subject is not yet careful.
Pet: A paraphrase for this sentence would be Please be very careful.

(3) Pet: Type in a sentence containing MUST
User: You must be very careless
Pet: Is very careless a good thing for you to be?
User: No
Pet: A possible paraphrase would be I think it is certain that you are very careless.

2.5 The other aspect of modal meaning which this algorithm claims to model is the fuzziness of the root category. Sentences containing root MUST can be plotted on a gradient from strong obligation, which can be paraphrased with an imperative form (see examples (1) and (4), through less strong cases, typically passive (5) or self-exhortation (6), to weak obligation, which can be paraphrased by 'it is important that' (7). The flow-chart for ROOT paraphrase

(see Table 2) shows how we have attempted to incorporate fuzziness into the model. Although it works surprisingly well, it is crude in that it is restricted to using clues from the immediate syntactic environment. Examples (4) to (7) below illustrate the program's sensitivity to gradience:

(4) Input: You mustn't interrupt me
Output: Don't interrupt me

(5) Input: We must offer homes to the boat people.
Output: It is essential that we offer homes to the boat people.

(6) Input: Heat must be added at the moment of highest pressure.
Output: It is imperative that heat be added at the moment of highest pressure.

(7) Input: Zookeepers must realise that animals are tricky (and must not feel sentimental about tarantulas and lynxes).
Output: It is important that zookeepers realise that animals are tricky.

2.6.1 There are many other aspects of the program which deserve comment. For example, the other words in the input sentence are scanned and compared with a list of words/strings associated with epistemic usage, e.g. I think, I mean, presum, sure, assum. The incomplete strings allow the program to interpret either presume or presumably, or assume or assumption as relevant. Example (8) illustrates this, together with the facility for deleting tag questions:

(8) Input: I think this must be the place, mustn't it.
Output: I think it's certain that this is the place.
Note: the program deletes initial I think before assigning a paraphrase, to prevent repetition.

2.6.2 Interrogative sentences containing MUST are picked up by the first decision-point in the flow-chart, which tests for wh-question words at the beginning of the sentence, or for MUST occurring initially.

(9) Input: Must you make such a row?
Output: Is it absolutely necessary for you to make such a row?

2.6.3 Finally, for cosmetic reasons, a great deal of effort has been put into making sure the paraphrases are grammatically correct, in particular checking for concord between subject noun and verb. This aspect of the program is trivial in that it is irrelevant as far as testing the model is concerned. However, it should not be passed over entirely without mention, and the following examples illustrate one of the more elegant of these features, the ability of the

program to interpret compound noun phrases of the Jack and Jill type as plural.

(10) Input: John and Sarah must be coming by car.
Output: I think it's certain that John and Sarah are coming by car.

(11) Input: You and I must meet again soon.
Output: It is essential that we meet again soon.

3.1 The program itself is structured into three main blocks: the main program, epistemic paraphrase and root paraphrase. The program is written in Microsoft (C) Basic and runs in 10-12K. It was developed on a Commodore Pet micro-computer belonging to Liverpool Polytechnic Department of Architecture. (Note 1)

The Commodore Pet in its stand-alone form has a video screen, a keyboard and a cassette recorder for recording programs and data. The program as written uses the screen to display the dialogue between program and user, the keyboard for input of data and the cassette for storing the program itself and data built up during a run of the program.

3.2 The program was written from the flow-chart downwards, but the sort of tests that are included in the flow chart were influenced by the possibilities of the language, in particular, the fact that Basic is efficient at: string matching (whole strings), and sub string matching (left, right or mid segments).

In Microsoft Basic, string variables can be unsubscripted (0 to 255 characters) or subscripted (as many sets of 255 characters as defined in the DIMension statement). Thus WORD$ can be used to hold 255 characters and WORD$ (10) will hold 11 (0-10) sets of 255 characters. (Note 2) This means that you can refer to one of many sets of strings (ADJ$(n) - the n^{th} 'set' in the subscripted variable ADJ$), or, using the functions Left$, Right$ and Mid$, individual characters or groups of characters can be examined from text variables:

```
If T$ = 'STRING', then
Left$ (T$, 2) will give 'ST'
Right$ (T$, 2) will give 'NG'
Mid$ (T$, 2) will give 'TRING' (all characters from 2 to end)
Mid$ (T$, 2, 2) will give 'RI'
Len$ (T$) will give 6 (number of characters)
and if
A$ = Mid$ (T$, 2, 1) + Mid$ (T$, 4, 1) + Mid$ (T$, 3)
then A$ contains 'TIRING'
```

3.3 One interesting aspect of the program is that no attempt is made to break the input sentence up into 'words' in the first instance, but instead the sentence is divided into three parts: all the characters to the left of the word MUST, MUST itself, and all the characters to the right of

MUST. If at any time a word needs to be isolated from the first or last of these strings, then it is picked off as needed. This reflects the strategy of the flow-chart which works outwards from MUST. In many cases, then, a solution can be found (that is, a paraphrase can be assigned to an input sentence) by looking only at a small central portion of the input string.

3.4 The main part of the program occupies lines 0 - 999. The routines used by the program are as follows:

Line nos.	
1000 - 1250	Root Paraphrase
2000 - 2440	Epistemic Paraphrase
3000 - 3130	Identifies and deletes any sub-strings associated with modal usage (see 2.6.1)
4000 - 4070	'Word after'
5000 - 5070	'Word before'
6000 - 6100	Sets flag for pronouns and/or plural (see 2.6.1)
9000 - 9230	Data input
10000 - 10300	Output sentence (after paraphrase)
10300 - 10360	Output formatting (avoids words being split up)
10500 - 10540	Deletes tag questions (see 2.6.1)
11111 - 11180	Data output

Lines 500-570 can also be identified as a separate routine, though used only once, for putting the correct suffix on a word when forming a participle.

Copies of the program are available and can be obtained from the authors on request. (Note 3)

4. Programming is a discipline which quickly reveals unclear thinking. It is all too easy when theorising in verbal terms to imagine you have been explicit when you have not. The program described here is an exercise in being explicit, and was designed specifically to test a model of modal meaning. It should be noted that we do not claim that this program is a model of (part of) the human language faculty. Like Winograd's (1972) blocks program, it works by interpreting words and the relationships between them; it is a syntax-based program. It seems to us that programs which concentrate on meaning rather than words, such as those formulated by Schank (Schank and Colby, 1973) and Wilks (1972), come closer to modelling the understanding of natural language. What we do claim is that insofar as our program succeeds or fails, it is a rigorous test of our theoretical intuitions about our understanding of the modal auxiliaries in English.

NOTES

1. We would like to thank Liverpool Polytechnic Department of Architecture for their generosity in giving us so much time on the Pet micro-computer, even to the extent of letting us take it home with us at weekends!

2. The dollar sign, $, is used in Basic to indicate character strings and distinguish them from numerical variables. (Eds.)

3. Please send a blank, high-quality cassette tape with any request for the program.

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SOME COMMENTS ON THE FUNCTION OF SENTENCES IN DISCOURSE

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Sinclair and Coulthard (1975) present a model for describing the structure of spoken interaction. This article develops a similar model, but starts with the assumption that the presence of sentences in spoken conversation is of structural importance. A distinction between syntactic contributions and nonsyntactic contributions is used to analyse a sample text into component moves. Decisions made in this analysis are justified by reference to properties of naturally-occurring conversation, properties of structure at higher ranks in the theoretical model, and a property of language arising from the interaction of function and form.

Recent work in linguistics has stressed the need to look beyond the level of the sentence in order to account for meaningful linguistic patterning: work on intonation (Brazil, 1977), on supra-sentential structure (Sinclair & Coulthard, 1975), on turn-taking (Sacks, Schegloff & Jefferson, 1974), and on cohesion (Halliday & Hasan, 1976), has all taken text or discourse as its starting point, characteristically working with naturally-occurring data. This sets such work apart from sentence-linguistics and linguistics based on hypothetical examples, for instance, in the Chomskyan tradition.

The present article, based on some of the ideas developed in my MA thesis (Richardson, 1978), is a contribution to research in the discourse tradition. It is most clearly related to the work on discourse structure initiated by the book: Towards an Analysis of Discourse: the English Used by Teachers and Pupils (Sinclair & Coulthard, 1975). One issue for that research (p. 23) was the relation between syntactic structures and discourse structures. I am addressing this issue at a very basic level, by trying to discover where, in the structure of discourse, syntactic structures occur. It is appropriate to begin this discussion by introducing some of the basic assumptions of the earlier work.

Sinclair and Coulthard are following in the British functionalist tradition, whose most eminent representatives are J.R. Firth (e.g. 1957) and M.A.K. Halliday (e.g. Kress, 1976). They adopt Halliday's general framework, as represented in Halliday (1961). One of the main formal notions in this framework is the rank scale. In a rank scale, a unit at a given rank is made up of one or more units of the rank below, and (excepting cases of rankshift) combines with other units of the same rank to form a unit of the rank above. The rank scale devised by Sinclair and Coulthard had five ranks: act, move, exchange, transaction,

and lesson. (The data were classroom interaction, so the rank 'lesson' may be situation-specific.) The act was the smallest discourse unit, the lesson was the largest. They also claimed that this rank scale overlapped with the grammatical rank scale, whose ranks, from lowest to highest, were morpheme, word, group, clause and sentence. Grammar and discourse were thus distinct levels of analysis, although a grammatical clause could realise a discourse act.

It is one thing to argue for the discontinuity of levels between grammar and discourse: it is another thing to assume that sentences have no relevance in a description of discourse. In Sinclair and Coulthard's description, items of the lowest discourse rank are sometimes realized by items which would traditionally be called 'sentences', sometimes not. For example (p. 41):

directive	(d)	Realized by imperative. Its function is to request a non-linguistic response.
bid	(b)	Realized by a closed class of verbal and non-verbal items - 'Sir', 'Miss', teacher's name, raised hand, heavy breathing, finger-clicking. Its function is to signal a desire to contribute to the discourse.

Since this is the case, it would appear that, for Sinclair and Coulthard, 'sentences' as such have no privileged status in discourse description. Indeed, they apparently believe that the category 'sentence' is only relevant in descriptions of written text, not in spoken language:

> 'The shadowy syntactic unit sentence is worth consideration; never adequately defined even in written language (Fries, 1957), it is capable of wide stylistic variation and seems virtually irrelevant in speech'. (p. 120, my emphasis)

My own position is simply that the unit sentence is not irrelevant in speech, but that sentences, or syntactic contributions, are as important as nonsyntactic contributions (like some of the linguistic items which realize 'bid' above), and that these two contrasting types of utterance have different jobs to perform in the discourse. I conceive of a syntactic contribution as one which is structured around a finite verb. This understanding is at odds with some versions of syntactic theory, such as that which underlies the descriptive grammar of Sinclair (1972). Sinclair employs a category of 'moodless' sentence (pp. 19-20). It is not the case that his 'moodless sentences' correspond exactly with the present category of 'nonsyntactic contributions', however many of the items which I have so classified would be termed 'moodless sentences' when described by this grammar. On the other hand, some elliptical forms, with the verb 'missing',

which would be understood as moodless sentences by Sinclair, are here counted as a subcategory of syntactic contribution.

Syntactic and nonsyntactic contributions are on the lowest rank in this description of discourse, which, like Sinclair and Coulthard's, is a hierarchical, rank scale model, developed in samples of talk which took place in a Teachers' Centre one day in September 1977. One of these samples is included as an appendix to this paper. I will not go into great detail about the properties of the model, since the purpose of the present paper is to develop and motivate the distinction between syntactic and nonsyntactic utterances. Detailed exposition is given in Richardson (1978).

These two types of utterance, as well as contrasting in internal structure, also have different functions to perform in the discourse, as the rest of this article will illustrate.

Contributions of both kinds combine with one another in structural patterns to form moves. There are two types of move, syntactic and nonsyntactic. A well-formed nonsyntactic move consists of <u>at least one</u> nonysyntactic contribution. A well-formed syntactic move consists of <u>one and only one</u> syntactic contribution plus (optionally) nonsyntactic contributions before and/or after. For example:

(1) A: mm

(2) C: now/we didn't know which would come out the best, either with it altered like that * * or whether * * with a piece of paper stuck over it like that

Notational conventions

The text in the appendix, and the sections from it which are quoted in this paper, have been analysed into component moves and contributions using the following notational conventions:

1. Syntactic contributions are underlined.
2. Interrupting nonsyntactic contributions are bracketed.
3. Framing contributions are marked off by slashes.
4. Question-marks within brackets indicate untranscribable talk.
5. Asterisks represent pauses, measured in rhythmic beats (one asterisk to each beat).
6. Each new move begins on a new line.

The speakers are designated 'A' and 'C' because this was how I arbitrarily represented them in the original thesis.

In (1) above, A utters a nonsyntactic move consisting of one nonsyntactic contribution. In (2), C utters a syntactic move, consisting of an initial nonsyntactic frame (the optional element) followed by a syntactic head (the obligatory element). A framing utterance may consist of more than one nonsyntactic contribution; for example:

(3) A: mm, yes/that would probably be better

Some of the classification decisions made in connection with the appended transcription are not self-evidently correct, and some may even seem counterintuitive. They raise specific questions, for which I believe that answers are possible:

1. Why is 'hello' a nonsyntactic move on its own and not a nonsyntactic utterance acting as a frame to the syntactic head 'I'm sorry ...' etc?

2. What kind of item is 'uh' when it occurs in the middle of a syntactic utterance?

3. Why has 'I see' been analysed as a nonsyntactic utterance when it appears to have the syntactic structure SP, with the subject realized by the pronoun 'I' and the predicate realized by the verb 'see' in the present tense? (The item 'you know' raises the same question.)

4. What are the phonological differences between:

(4) A: mm, yes/that would probably be better

and

(5) C: mm.
now/are you open at the dinnertime

to justify, in the first case, treating the two nonsyntactic utterances as belonging together within one move, and in the second case, treating them as belonging to separate moves?

To justify the decisions which I have made I want to argue the importance of the following facts: first, that spontaneous conversation is characteristically composed in 'real time', unlike written language which can be worked over many times before it reaches a final form; second, some units enter into the discourse from the higher ranks of exchange and transaction - the distribution of syntactic and nonsyntactic utterances can differentiate types of exchange and transaction as well as types of move; third, the function of a unit (its position in a higher-rank structure) can sometimes override its internal structure (its composition in terms of lower-rank units) as a criterion for classification. For example, certain apparently

syntactic utterances are best seen as 'honorary' non-syntactic utterances under certain circumstances. This can be compared with the situation in syntax glossed by Berry (1975:77) as 'the relationship between type of item and element of structure'. She points out that items can be divided into classes 'on the basis of their likeness in potentiality for representing a certain element or elements in structure' (p. 76), or into types 'on the basis of their own structure' and that these two classifications are unlikely to be isomorphic. In these terms, then, discourse has items whose class-classification does not correspond to a type-classification; this point will become clearer below.

To take the first point. From a common-sense point of view it makes sense that 'hesitation phenomena' should occur when a speaker is constrained to produce a sentence 'on the spot', as in the following example:

(6) C: I'm sorry about want always wanting things in a rush but its (uh) * really not our fault not in the office anyway.

The hierarchical model, however, specifies that nonsyntactic utterances frame syntactic ones, that is, stand on either side of them. This need not be a contradiction if we assume that nonsyntactic contributions like 'uh' which disrupt a flow of syntax are not entering into a structural relationship with that syntactic structure. The speaker can, and frequently does, carry on from where s/he left off in the sentence before the disruption took place. This also illustrates that understanding syntax is a process of continuous classification. A hearer does not need to hear to the end of a sentence to know that it is a sentence which s/he must decode. Given that s/he has heard a set of sounds as contributing to a potential sentence, the hearer will be able to classify all subsequent sounds as to whether they are structural contributions to the sentence or not. S/he is also able to monitor for possible completion parts for that ongoing sentence. I suggest therefore that in (6), 'uh' will be heard as not contributing to the syntactic structure of this sentence, but that neither will it be heard as preventing that sentence from being completed. The same is true of short pauses, which are less disruptive than non-syntactic contributions of this kind.

Intonation can operate in a similar way to help determine where move and utterance boundaries are to be located:

(4) A: mm, yes/that would probably be better

(5) C: mm.
now/are you open at the dinnertime

In the first of these two examples, the whole sequence is incorporated into one tone group. In the second example, 'mm' has an intonation contour of its own, so there are two tone groups here, one for 'mm' and one for 'now/are you open at the dinnertime'. 'Mm' must therefore also be seen as the nuclear syllable of the tone group, whereas in (4), 'mm' forms part of the pretonic, and the tonic eventually falls on 'better'.

Moving to the second point, this concerns the higher-rank structures of the hierarchical model. The rank above the move is the exchange, a structure which is constructed by the collaborative efforts of a pair of speakers, rather than by a single speaker as in the case of a move. It is useful to regard an exchange as a two-part structure which has to begin with a syntactic move from the first speaker. Example (5) featured a move boundary located between 'mm' and 'now'. This was justified by reference to intonation. Another justification is that 'mm' is appropriate in terms of exchange structure. The previous move, from A, went like this:

(7) A: mm, yes, all right, well/I'll (um) * I'll mention it and (uh) mr Ri and mr (er) * Cade when he comes in

This can be seen as the first move of an exchange, which makes possible, as a response, an acknowledgement from the other speaker. And it is perfectly acceptable to characterize C's 'mm' as providing that response. 'Are you open at the dinnertime' is clearly initiating a new exchange: this leaves 'now' which belongs either to the response or to the initiator, and the meaning of this item makes it more plausible as a frame than as part of a response move.

Above the rank exchange is the rank transaction. Transaction can consist of any number of interlocking exchanges: and exchanges interlock whenever the response move takes the form of a syntactic move rather than a nonsyntactic move, since anything syntactic predicts a following response from the other speaker. For example:

(8) C: I'm sorry about want always wanting things in a rush but its (uh) * really not our fault not in the office anyway

A: oh, I see, mm/this the headed paper

C: yes, um **/it's the headed paper

If A had used a nonsyntactic move, C would be obliged to initiate a new transaction, since the sequence of interlocking exchanges would have failed. So transactions end

on nonsyntactic moves, and begin, like exchanges, on syntactic moves. There is one exception to this rule, which differentiates transactions which open and close conversations from those which occur between opening and closing transactions. Opening transactions begin with nonsyntactic moves like 'Hello', 'hi', 'good morning'. In principle, they should be reciprocated in some way, but in practice the first speaker (like C in this piece of interaction - see appendix) often moves straight into the first conversational transaction, initiated with a syntactic move. Closing transactions begin with nonsyntactic moves like 'bye', 'cheerio', etc. (Schegloff & Sacks, 1973, have dealt very nicely with the question of 'closings', although operating within a different theoretical framework.)

The third point of detail that I wish to take up, concerns the classification of 'I see' and 'you know' as nonsyntactic contributions. In spite of the syntactic structure which both items appear to possess, they enter the discourse at the structural places normally occupied by nonsyntactic utterances. For example:

(9) A: well/the only thing is (um) * * you'll probably get a * (you know) there'll be a little mark

Here 'you know' interrupts the ongoing syntactic structure. It is interesting that when the speaker gets back to her sentence, she goes right back to 'the only thing is', thus eliminating or ignoring not only 'you know' but also everything else that occurred between 'is' and 'there'll', which includes another interrupting nonsyntactic contribution and two pauses, as well as the syntactically coherent series 'you'll probably get a'.

In this tiny sample, both 'you see' and 'I see' occur in framing contributions:

(10) A: oh, I see, mm/this the headed paper?

C: you see/th' it's because we've had a new telephone number.

I would like to concentrate for a moment on the question: how could syntactic formulae have become functionally equivalent to nonsyntactic expressions? This is what seems to have happened. Perhaps once the syntax of 'I see' was important, say, in a response move within an exchange. If so, why would <u>that</u> lexicogrammatical pattern be chosen rather than any other? Common sense tells us that it would be metaphorical for 'yes, I understand/accept what you say', or something like that, because that is often what a hearer is supposed to do when given information by a speaker. In other words it was never, in this context,

literally about 'seeing'. Now it happens that any utterance, from the co-participating speaker, after a piece of information from the first speaker, will seem to carry that 'I accept what you say' message. (A statement like 'I don't understand you' accepts without understanding. To accept a piece of information is simply to acknowledge that you have heard it.) But an utterance like 'yes' carries that meaning more transparently than others because it carries no other meaning on top of that. A questioning response obviously has more work to do, for example 'I've just come from the doctor' - 'What did he say?'. Does 'I see' do any more than that? I think this formula has behaved in a way that is characteristic of metaphors; if used often enough to do a particular job, the motivation for picking upon it as a suitable metaphor becomes forgotten. It is irrelevant, now, that 'to see' literally refers to operations of the optical apparatus, for, in this context, the words scarcely evoke their literal meaning. 'I see' is a metaphor for its function in the discourse, but it is questionable whether the metaphorical part of the utterance is still active.

The frame of reference developed here allows us to ask 'Why choose a syntactic move rather than a nonsyntactic move?' and vice versa. All choices are context-dependent, and I think it can be shown that the motivation for a choice sometimes concerns the giving or withholding of information (where one speaker knows something that the other does not); the manifesting of closeness or distance in the interpersonal relationship; the current set of constraints imposed by the discourse; the stylistic effects produced by choosing the option which is not the one that the discourse constraints would have predicted. These points cannot be developed in the present argument, but they produce evidence for the greater range of meaning potential which syntactic utterances have when compared with nonsyntactic utterances.

The arguments presented in this article are not based solely on this single text, but are the results of close analysis of a corpus which, although small (30 minutes) produced abundant examples of all these phenomena.

APPENDIX

(The notational conventions are described above.)

C: hello

I'm sorry about want always wanting things in a rush but its (uh) * really not our fault not in the office anyway

A: oh, I see, mm/this the headed paper

C: yes, um **/it's the headed paper

you see/th', it's because we've had a new telephone number

A: oh, I see, mm

C: now/we didn't know which would come out the best either with it altered like that * * or whether * * with a piece of paper stuck over it like that.

A: mm * * * *

well/the only thing is (um) * * you'll probably get a * (you know) there'll be a little mark (?)

C: well/that's what I thought

I think that's better

A: mm, yes/that would probably be better

C: And could we have two skins while we're about it

A: mm, yes, all right, well/I'll (um) * I'll mention it and (uh) Mr Ri and Mr (er) Cade when he comes in

C: mm

now/are you open at the dinnertime

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TOPIC INITIATION - ONE STEP OR TWO: SOME FACTORS INVOLVED IN MOTHER-CHILD INTERACTION AT THE PRELINGUISTIC STAGE

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The problems of constructing adequate dynamic models of conversation are not new to researchers in discourse analysis. The large degree of variation in human interaction, which is due to the complex interrelations of numerous constraining factors, makes such models notoriously elusive. Predictions of what a speaker will do at any given point in an interaction, or even specifications of the options he chooses from, consciously or unconsciously, are extremely difficult. Often only the broadest, and therefore the least useful, specifications are possible. Various models have been proposed which attempt, with varying degrees of success, to overcome these problems. The analysis of conversational exchange structure by the Birmingham English Language Research group, for instance, (Coulthard and Brazil, 1979) offers a model which defines the restrictions on the sequencing of the formal and functional units of discourse. The analysis of side sequences by Jefferson (1972), and of replies and responses by Goffman (1976), are further examples, as is the work of Labov and Fanshel (1977) on the therapeutic interview.

In investigating topic initiation in young children, a particularly useful model is that presented by Keenan and Schieffelin (1976). This is a model which sets out to specify what the speaker must do in order to initiate a topic. It is framed in terms of the steps the speaker must take in order to be successful. In what follows I shall outline their model, and then present evidence to show that various factors are involved in whether the 'speaker' realises these steps as a single unit or separately. I shall show that while the content of the steps they outline is clearly involved, they do not necessarily have to be realised as separate activities (a fact of which Keenan and Schieffelin are also aware), and that they rarely are in the case of pre- and early linguistic infants in interaction with mother. Moreover, even when they are realised formally as two steps, there is a sense in which they function as one. I am concerned in this paper with whether, in the turn which opens the topic initiation, children do or do not combine the behaviours involved in gaining attention to themselves, with the behaviours involved in identifying the discourse referent (directing attention to the new topic). This is irrespective of whether the mother immediately interprets the child correctly, or whether several turns occur before the topic is successfully established or the attempt is abandoned.

Prerequisites for establishing a discourse topic

Keenan and Schieffelin detail the following steps which represent the prerequisites for establishing a discourse topic - what the speaker must do in order to initiate a topic:

Step 1: The speaker must secure the attention of the listener.

Step 2: The speaker must articulate his utterance clearly.

Step 3: The speaker must provide sufficient information for the listener to identify objects, etc., included in the discourse topic.

Step 4: The speaker must provide sufficient information for the listener to reconstruct the semantic relations obtaining between referents in the discourse topic.

Keenan and Schieffelin's model is based on data from verbal children and adults, but, as I shall attempt to show, the descriptions of the steps can, with only slight modification, be applied to preverbal infants and to the very earliest stages of language development. The first two steps, taken together, are general requirements on successful communication, but in the context of topic initiation, they mean that the child must ensure that the conversational partner (in the data to be discussed, the mother), is aware that he is attempting to initiate a topic. The child is referred to as 'he' in general references of this kind simply as a convenient means of distinguishing child from mother.

Step 1 involves either a check that mother is attending, or some kind of active attention-getting device, or the assumption by the child that he has his mother's attention. Step 2 can be rephrased for prelinguistic discourse as 'the child must articulate clearly his non-verbal behaviour, movement and vocalisation', Steps 3 and 4 cover the means by which the child succeeds in directing attention to the new topic, by identifying the new discourse referent (step 3) and precisely what he intends to convey about that referent (step 4). It should be noted that these steps do not themselves ensure that a topic is actually established, since, as in all interaction, success depends on co-operation. Particularly in immature communication, mother's willingness to interpret and respond to a young child's attempts to communicate is as crucial as the child's skills in making his intention clear.

I shall try to demonstrate in this paper that the means by which the child gets and directs attention, and whether attention-getting and attention-directing is a one or two-step process, depends on the type of topic to be initiated, the stage of development of discourse skills of the child, and the particular intimacy of participants in mother-child

interaction. Before turning to discussion of these issues I shall briefly describe the study and data used in this presentation.

The Study

The study was carried out with five mother-child pairs. The data is in the form of video-taped interactions collected in the home. Each pair was filmed over two one-week periods, the weeks being separated by an interval of six months. At the first set of recordings the children were aged 0;1, 0;5, 0;9, 1;3 and 1;11. At the second set of recordings the children were, of course, all correspondingly six months older. The study is therefore based on ten ages spanning the first two-and-a-half years of life. For each pair, one hour's tape was collected over each period (except for the youngest child at 0;1 of whom only one half-hour was collected). The total amount of tape data analysed was therefore nine-and-a-half hours.

All the data was collected without constraining the situation beyond what was inevitable due to the invasion of the families' privacy by myself and my equipment. All the data was transcribed and analysed. The major concern of the analysis was to isolate the topic initiation sequences and then to examine: (a) which channels of communication were used (vocal, gaze and movement - gesture and other conversationally relevant movements); (b) how the channels were being used at each age; and (c) whether there were any observable preferences for particular channel combinations at particular ages. The data was examined in terms of a model of conversation, based on that proposed by Keenan and Schieffelin (1976), which clearly separates attention-getting and attention-directing, and it was in applying such a model to the data that the concern of this paper became a sufficiently crucial issue to lead me to examine just how frequently the two types of behaviour were distinct in the topic initiation, and whether the facts could be explained by reference to other features of the topic initiation and the type of interaction generally.

Attention-getting, attention-directing and topic type

The most common means of getting attention to a topic which is being initiated, in both mature and immature discourse, is by some vocal utterance, though non-vocal means can also be used. (McTear, 1977, discusses a wide variety of means of getting attention.) In the data from prelinguistic children, the most frequently used attention-getting device was found to be some kind of cry, usually a central vowel fret cry, rather than a genuine distress cry. Greater variety was found in the means of identifying the discourse referent: pointing at, gazing at, crawling towards an object, for instance. However, all these behaviours are means of identifying something in the real world, the child's

physical environment, and are therefore only appropriate if the topic to be initiated is concerned with something in the environment. If the topic to be initiated is concerned with some internal state of the child or some abstract topic, such as a story, fantasy or whatever, then obviously such means of identifying the discourse referent are inappropriate, except in cases involving comparison with something in the environment here and now. One of the factors constraining the means of initiating a topic is therefore the type of topic to be initiated. A brief discussion of topic type in prelinguistic discourse is in order here.

In analysing the topic initiation data of 0-2½ year-olds I found it sufficient to make the distinction into the three types of topic already mentioned. Firstly there are the 'self' topics when the child attracts attention to himself as an object or person: his physical appearance, body posture, internal needs such as hunger, tiredness, needing a nappy changed and so on. The second type of topic is the 'environmental' topic where the concern is something in the child's physical environment: toys, food, mother and so on. The third type is the 'abstract' topic: defined as those topics which have to do with things not in the immediate physical world of the child. Thus it covers stories about past events, hypotheses about future events and discussion about abstract qualities or properties. The distinction between 'abstract' and 'environmental' topics is not always easy to draw. For example, Ross (2;6) points to a chair and says <u>That's Mummy's chair</u>. This clearly exhibits a degree of abstraction beyond simply identifying the object as a chair, but it is still based, in one sense, in the here and now. Clearer examples of 'abstract' topics are such things as Ross (2;6) saying, <u>Ross have toast</u>, interpreted by mother as referring to the fact that his grandmother had given him toast for breakfast when he had stayed with her. Doubtless as children develop linguistically, much finer distinctions within the category of 'abstract' would need to be drawn. Despite the problems already mentioned, however, for the period of the first emergence of such topics, the cover term of 'abstract' was found to be adequate for the purposes of the study. All the topic types were identified on the basis of observational and functional criteria: what mother interpreted her child as being interested in, coupled with the child's reaction to the interpretation and supported by my own assessment of what the child seemed to be communicating.

To return to the relationship between topic type and the means by which they are initiated, 'environmental' topics require some kind of behaviour which identifies a particular aspect of the environment. These were found to range from simply gazing at the object (the least efficient means of ensuring success), through pointing or reaching in the appropriate direction, to naming or otherwise linguistically identifying the topic. A combination of linguistic and gestural identification is the most efficient means available to the child beginning to acquire language. 'Abstract'

topics require a more precise linguistic deixis, for example when Ross at 2;6 says I run around in the dark, while 'self' topics can depend either on linguistic means such as saying I'm hungry, if this is within the capabilities of the child or, before this stage, some means of attracting attention to his needs, for example a hunger or pain cry, or the central vowel vocalisation. Whatever he does, he does not need to redirect attention from himself to something other than himself. In the data I studied there were no cases of linguistic identification of a 'self' topic, all being initiated by a one-step attention-getting device. There is obviously a problem of circular definition here since it may be that both mother and I interpreted attention-getting behaviour in the absence of other cues as 'self' topics. I can only say that in all cases the child seemed content with the interpretation, though the reasons for this may be more complex than simply that the interpretation was correct. Because all the 'self' topics were one-step, the rest of this paper will be concerned with 'environmental' and 'abstract' topic initiations.

Isolating attention-getting strategies

Before discussing some examples of topic initiations from the data, it is necessary to examine the problem of how to distinguish attention-getting as opposed to attention-directing behaviours in analysis. This is not as straightforward as it might seem, and appears to have led to some problems for investigators. Atkinson (1974), for instance, argues for a functional definition, such that even if an utterance contains a word with a clear referent it can be regarded simply as an attention-getting device if that function overrides it. He gives an example of what he calls an attention-getting utterance when a child, having seen a 'mini-car' go by in the street, shouts Mini repeatedly until he receives some acknowledgement that it is indeed a 'Mini' and then says Car. Clearly the utterance Car is step 4 in the Keenan and Schieffelin framework, but Atkinson claims that the utterance Mini - word and paralinguistic gesture - is being used as an attention-getting device. I suggest, however, that it is only the paralinguistic gesture that is the attention-getting device (steps 1 and 2). The actual word used, Mini, must still refer to the object, must identify the discourse topic, and as such be an attention-directing strategy (step 3). This indeed seems to be an example of attention-getting and step 3 of attention-directing being accomplished in a single step.

Much of the data from prelinguistic infants presents problems due to the lack of language and of an agreed symbolic system with stable referents. However, it is possible to employ a pragmatic/functional method in making the distinction between attention-getting and -directing behaviours. This involves identifying firstly those behaviours which clearly identify the discourse referents, and then classifying the remaining behaviours in the communication as functioning to get atten-

tion. Obviously it would be more satisfactory if it were always possible to assign behaviours to the attention-getting category positively. Sometimes it is, as in the case of a scream or a word such as Hey, but not always. On the other hand it is possible in most cases to be fairly certain which behaviours pertain to the topic: hence the logic of the analysis. Such a method of analysis can also be justified on the basis that the mother can plausibly be seen as operating with similar interpretative procedures in understanding the child's communication. Whatever the child actually 'intended' his behaviours to mean, the mother can only respond to what she sees and hears, and relate it to what she knows of the child's communicative system.

One step or two?

Having made the distinction just described, I then proceeded to see how frequently there was a clear two-step initiation observable in the data. In all but a handful of cases it seems that the two goals of getting and directing attention are achieved in a single move or behaviour cluster. I shall discuss some examples of one and two step initiations of 'environmental' and 'abstract' topics and attempt to show that it is not the immediate demands of the conversation in terms of the mother's gaze/attention that determines the form of the initiation, as might be expected, but an inter-relation of the degree of intimacy of the participants coupled with the stage of communicative development of the child. First though, here is an example of a one step initiation of a 'self' topic for comparison purposes:

Kate at 1;10

Mother and child are in the kitchen. Mother is preparing food.

C. climbing to a standing position on a chair + gaze at mother + cry

M. Yes I'll be with you in a minute Kate love.

The following are some examples of one-step initiations of 'environmental' topics:

Nicholas at 0;9

It is meal time. Nicholas is being fed with a spoon. Having just fed him a spoonful, mother pauses with the next full spoonful in hand.

M. makes a palatal clicking noise + gazes at child's cup and the bowl of food on his tray.

C. gazes at spoon of food in mother's hand.

C. gazes at cup + /mm/ + hand out in grasp position to the cup and back. Then gazes away to the tray of his highchair and the spoon in mother's hand.

M. gazes at child + Another drink? Then: gives him a drink.

In this case both the attention-getting behaviour (the /mm/, and we can count the fact of the hand movement as attracting attention) and the attention-directing behaviour (gazing at the cup and the hand movement to the cup) occur together. Mother is not gazing at Nicholas at the time of the topic initiation so a separate strategy to get her to attend to him might have been appropriate. It does not occur and she gazes at him only after he has initiated the topic. The initiation probably succeeds because she happened to be looking at the topic, though Nicholas must be unaware of this.

Russell at 0;11

Mother and child are playing together with a Mickey Mouse toy.

C. releases the toy + turns towards the cat + gaze at the cat + /ə/

M. /Oh/

C. /ə/

M. It's more interesting (clearly refers to his new interest.)

Because mother and child are already sharing attention, the child has no reason to gain mother's attention before directing it. The one-step is therefore to be expected. We can view the abrupt movement (turning away) and the vocalising, as getting attention. The direction of the movement and the direction of gaze identify the cat as referent.

Kate at 1;3

Mother and child are playing together with a posting box. During this interaction Kate has begun to show interest in a book close to her. She has been distracted from it by mother and has returned to playing with the posting box. Mother and child are gazing at each other.

C. /bəwɚ/ + gazes at book + lifts book up and down.

M. (laugh)

M. hand out takes book from child + <u>You want the book instead do you</u>?

C. gazes at mother.

Kate already knows mother is attending to her; she does not therefore need the attention-getting strategy (/bəwæ/) that she uses. This case is actually rather problematic for, though /bəwæ/ does not obviously identify the referent, we might still not want to say it is an attention-getting stragegy. It is not a recognisable adult word, however, and must therefore be treated as serving to get attention, but we should beware of making assumptions about first words which might be dependent on the degree of phonetic similarity with, or difference from, adult word forms. Despite its lack of similarity with an appropriate adult word in this context, /bəwæ/ may still be a referring expression in Kate's system. It is worth discussing this point in a little more detail as it seems crucial to the analysis of child discourse.

Many of the topic initiations found in the data from the second year involve what appear to be phonetically stable forms occurring in functionally similar slots in the interactions. One particularly characteristic, though clearly idiosyncratic, sound of Kate's is /gæ/ (usually occurring in this form, though occasionally as /gʌ/ or something very similar). As it occurs so frequently in the data it is necessary to try and decide how it functions. Take the following example:

Kate at 1;3

Mother and child are playing with a toy duck. Mother is gazing at Kate and Kate is gazing at the duck.

C. gazes at elephant + /gæ/ + points at the elephant. Then: continues pointing at elephant + gazes away + /gæ/. Then hand down.

M. gazes where Kate points.

M. <u>What (do) you see</u>?

C. points to elephant + /gæ/. Then: continues pointing + gaze at mother + /gæ/

M. <u>Yes it's elephant isn't it there</u>?

The question for consideration here is whether the /gæ/ is an attention-getting vocalisation on a par with <u>Hey</u> or <u>Look</u> in adult speech or whether it is to be regarded as a deictic pronoun such as <u>There</u> or <u>That</u> and therefore be a candidate for classification as attention-directing (depending on how we regard such deictics in adult speech - identifying loca-

tion specifically or drawing attention to location). If we postulated a shift in the place of articulation from velar to alveolar, and eventually to labio-dental, we could suggest more forcefully that /gæ/ is a precursor of the deictic pronouns, fitting into the pattern which Carter (1978) postulates for these words. I see no adequate way of deciding how to categorise such early utterences with certainty, but the attempt raises the important question of how we recognise first words and on what basis.

To return to the main concern of this paper: when we look at the 'abstract' topic initiations we find that sometimes there is an attention-getting word preceding the utterance which identifies the topic, that is, there are formally two steps. However, in none of the cases found in the data did the child pause and check the effect of his attention-getting device before going on to identify the discourse referent. For example, at 2;6 Ross claims that his cold cheese is hot: Oh cheese /hæʌ bɪg əʊ²/ hot. (This is categorised as an 'abstract' topic because he is fantasising. We cannot rule out the possibility that he is simply using the word Hot inappropriately, though this seems unlikely in view of the Ow which precedes it.) Ross gazes at his mother after the attention-getting Oh at the beginning of the utterance but does not pause before identifying the discourse referent. She does not look at him until he says Hot at the end of the utterance. Similarly, take the following example which must be categorised as two steps though they do not seem to function as two.

Ross at 2;6

Mother and child are having lunch.

M. puts piece of apple on Ross's plate and returns to eating and gazing at her own food.

C. picks up apple + gaze at apple + screams.

M. gazes at C.

C. Hey. Then: Bitten it + gaze at M. + extends piece to M.

Here, while he uses what can clearly be seen formally as an attention-getting strategy followed by identification of the discourse referent, Ross does not check the effect of the attention-getting strategy - he does not look at mother after the scream, or pause after Hey, because, I suggest, he can assume that mother is attending to him. Also he is already identifying the referent non-verbally by handling the apple. I suggest that both examples should be seen formally as two-step initiations functioning as one-step initiations. The child demonstrates that he can get and direct attention as separate activities, but the particular

attentional characteristics of mother-child interaction are such that they do not need to be executed as two separate steps, as I would expect to be required in situations where the participants were less intimate.

Let us look now at two two-step initiations of 'environmental' topics. The following example involves an ordering of behaviours which suggests a two-step process:

Lauren at 0;7

> Lauren is in a baby-bouncer suspended from the door frame. Mother and child are gazing at each other. Lauren has a toy duck in her hand.
>
> C. gazes away and down + /ə²æʰ/. Then drops the duck in her hand + gazes at the duck.
>
> M. Oh, you dropped that one again (tut) I don't know.

Here we are dealing with what appears to be a two-step initiation, but in order to be confident in classifying it as such, we must be certain that the behaviour categorised as attention-getting is in fact part of the communication. We need to ask if /ə²æʰ/ is actually part of the topic initiation. If Lauren had gazed at her mother at the same time or immediately after this vocalisation, as Ross did in the previous example, we could be fairly confident in saying that it is an attention-getting device. However, children of this age, under 9 or 10 months, rarely do check mother's attention in this way, this skill coming into operation towards the end of the first year, (see Trevarthen, 1977, on the emergence of secondary intersubjectivity). Because of this, we might expect that children in their first year would rarely use two-step initiations. However, if the development of this particular skill were the only factor involved, we would expect older children to use two-step initiations fairly frequently and this does not seem to be the case.

The following is another example of a two-step initiation but again, as with the 'abstract' topic examples above, Kate does not check attention after gaining it.

Kate at 1;3

> Mother and child are playing a game balancing a brick on Kate's head. Mother and child are gazing at each other. Mother holds Kate's hand as she helps balance the brick.
>
> C. screams + pulls her hand away from mother's + gazes at toy roundabout on the mantlepiece.

M. releases Kate's hand + No

C. continues to gaze at the roundabout + moves towards it + /urəe² ərurəe/

M. What d'you want?

C. /eɪreə/ + hand out open to roundabout. Then: gaze at mother.

Clearly the scream is functioning as a separate attention-getting strategy since, while she also gazes at the new topic, she does not actively attempt to identify it with the skills available at this age. It is not until she moves towards the roundabout that she starts to identify the referent. As with some of the cases discussed above, the use of the attention-getting device is actually unnecessary since Kate already knows mother is attending to her.

Conclusions

The occurrence or lack of occurrence of two-step initiations seems not to be dependent on any simple measure of the immediate state of attention of the interactional partner. The stage of development of the child's conversational skills, particularly the ability to monitor the mother's attention, does however seem to be involved and would seem to account for the lack of two-step initiations during the first year.

Also involved is the type of topic to be initiated. Perhaps the single most important factor, however, is the knowledge and expectations which the participants have of each other and the style of the interaction. Mother-child interaction is always either actually or potentially in progress. There may be suspensions of interaction but no great effort is required to resume it. This fact seems to explain why even when two steps occur they still function as one unit.

In this paper I have examined just some of the factors involved in determining how discourse is actually realised. There may be several other factors involved: certainly individual differences, such as Kate's /gæ/ discussed above, must be looked at in more detail. Adequate models of discourse can only result from the detailed analysis of a large amount of varied data.

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QUANTITATIVE ANALYSIS OF SYNTACTIC CHANGE

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Syntactic change of a purely quantitative nature has received comparatively little attention from linguists in recent years (Note 1). In the present paper, however, a method of analysis will be described whose purpose is to identify and classify such changes. Its application will be illustrated with reference to diachronic English positional syntax, the area of grammar concerned with the sequential arrangement of constituents. The paper is intended primarily as a contribution to the methodology of historical linguistics, but will also include discussion of some pertinent theoretical issues.

The method of analysis in question has been applied by the author (Connolly, 1977) to the evolving clause-rank positional syntax of the Middle English period, using a corpus of three early and three late ME texts, as follows (Note 2):

Early ME Texts	Late ME Texts
Hali Meidenhad (H)	Mirk's Festial (M)
Sawles Warde (S)	Royal Sermons (R)
Trinity Homilies (T)	Wyclif's English Homilies (W)

In order that the two groups of texts should be comparable, and to ensure as far as possible that the only difference between the two groups should be in respect of their dates, the corpus was selected on the basis of maximum internal homogeneity, given the limited availability of ME data. Thus, all six texts are prose, all are homiletic in character, and all emanate from the southern half of England. Further details may be found in Connolly (1977: 129-47), and a review of related research on diachronic English positional syntax is to be found in Chapter I of the same work.

Three hundred main clauses from each of the six texts were analysed syntactically, employing a three-level mode of grammatical analysis (Connolly, 1977: 189-275). Counts were then made of a variety of syntactic patterns, and, with the help of a computer, a large number of tables were obtained relating to the grammatical features of the texts. Four of these tables are reproduced here.

Table 1 indicates the frequency-of-occurrence of the contiguous and non-contiguous arrangements of predicator and following major element within declarative affirmative

	H	S	T	M	R	W
Non-contiguous	29	29	17	14	29	23
Contiguous	129	168	158	159	180	195
	158	197	175	173	209	218

	Group A: ave. %	Group B: ave. %
Non-contiguous	14.2	11.0
Contiguous	85.8	89.0

	χ^2	Degrees of Freedom	Probability
Within Group A	5.2	2	> 0.05
Within Group B	3.3	2	> 0.05
Between Groups	2.3	1	> 0.05

Interpretation: no evidence of change

Table 1. Contiguity of predicator and following major element in declarative affirmative clauses.

clauses in each of the six texts. Major elements include subjects, objects, complements, and, of course, predicators themselves. In the contiguous arrangement, the predicator is immediately followed by the next major element, while in the non-contiguous arrangement, the predicator is separated from the next major element by an intervening minor element (in practice, usually an adverbial). The table naturally does not include those clauses where the predicator is not followed by a major element at all. It will be observed that among the earlier group of texts (henceforth group A), the contiguous arrangement exhibits an average frequency-of-occurrence of 85.8%, whereas among the later group (henceforth group B), the average incidence of the contiguous arrangement is 89%. This immediately suggested the hypothesis that a quantitative change may have taken place in the syntax of homiletic prose between the two periods represented by groups A and B respectively.

In order to evaluate this hypotheis, use was made of statistical methods, in the form of the well-known χ^2 test. (For a description of this test, see, for example, Connolly and Sluckin, 1971: 125-36, or Moroney, 1965: 246-69.) The test was first applied to the figures for group A and group B separately. In the case of group A,

χ^2 was not significant, even at the 5% level, and neither was the χ^2 value associated with group B. This indicated that the variation from one text to another within either group could not be safely attributed to any factor other than chance. It might well have arisen merely through the fact that the three texts of either group constitute different samples, drawn from the wider universe of homiletic prose at their respective periods.

So far, it has been established that the level of variation within both groups of texts is non-significant. In other words, both groups are, from the statistical point of view, internally homogeneous. This makes it possible to pool the figures within either group, to obtain Table 1a, which indicates the overall incidence of the contiguous and non-contiguous arrangements for groups A and B. For example,

	Group A	Group B
Total non-contiguous	75 (=29+29+17)	66 (=14+29+23)
Total contiguous	455 (=129+168+158)	534 (=159+180+195)

Table 1a. Totals for groups A and B, obtained from Table 1.

the figures in the top row of group A in Table 1 are 29, 29 and 17; added together, these come to 75, which is the top-row entry for group A in Table 1a. A χ^2 test was now applied to this table, and again the result was not significant. This value is recorded as the 'between groups' figure in the bottom line of Table 1. It indicated that the level of variation between groups A and B could, like that within either group, also be plausibly attributed to chance. There is, therefore, no evidence that the difference between groups A and B is due to any factor other than chance; and in particular, there is no evidence that the difference is due to any real change in the language of homiletic prose between the periods represented by the respective groups of texts. Thus, Table 1 offers no evidence of a genuine syntactic change.

The situation is rather different, however, in respect of Table 2, which gives the figures relating to the relative position of predicator and direct object in declarative affirmative clauses. In group A, the order predicator-object exhibits an average frequency-of-occurrence of 85.2%, while in group B the figure rises to 95.9%. Now, there is again no evidence of significant variation within

	H	S	T	M	R	W
PO	69	91	76	128	103	117
OP	10	16	15	3	4	8
	79	107	91	131	107	125

	Group A: ave. %	Group B: ave. %
PO	85.2	95.9
OP	14.8	4.1

	χ^2	Degrees of Freedom	Probability
Within Group A	0.5	2	> 0.05
Within Group B	(2.8)	2	> 0.05
Between Groups	21.1	1	< 0.001

Interpretation: shift

Table 2. Relative position of predicator and direct object in declarative affirmative clauses.

either group. Since the level of variation, then, within either group was not shown to be significant, the figures in the rows within either group were pooled as before, and a further χ^2 test applied, comparing the overall frequencies for the two groups. This second test proved significant, indicating that the distribution of the pooled frequencies was unlikely to have arisen by chance. Indeed, the probability of such a distribution arising by chance is less than one in a thousand. The distribution of the pooled frequencies must, therefore, almost certainly be due to a real difference in the language of the texts in Group A compared with that of the texts in Group B. Thus, Table 2 provides evidence of a genuine syntactic change between the two periods represented by the respective groups of texts. The particular type of change involved, namely a change from one statistically homogeneous state to another may be termed a shift; and this is the type of change which is presented as the interpretation of Table 2.

Admittedly, a certain tentativeness must attach to this and to the other findings reported here, for the following reasons. Although every effort was made to eliminate synchronic variation among the texts, apart from that due to

differences of authorship, it was not possible to find a complete set of texts all of which originated from precisely the same geographical location; it is probable, in fact, that the geographical scatter in the later group is greater than in the earlier group, since H and S are thought to belong fairly closely together. The last-mentioned texts also show traces of the old alliterative prose style; however, the influence of this appears to be rather small (cf. Wilson, 1959: 487). Latin influence on the texts cannot be ruled out, although any obvious translation was omitted from the corpus. It is also possible that the printed editions of the texts that were used contain certain transcriptional inaccuracies, though it is doubtful whether these would have a marked effect on clause-rank syntax. Again, because the exact dates of the texts are not known, the periods represented by the two groups cannot be stated precisely, though at least they do not overlap, the early ME texts being no later than the early thirteenth century, while the late ME texts date from the late fourteenth and early fifteenth centuries. The limitations in the availability of data also made it impossible to employ standard sampling methods, which means that the representativeness of the corpus cannot be estimated with the usual degree of precision. But in spite of these reservations, the most salient difference between the texts of groups A and B is the fact that they belong to different historical periods, so that at least the most obvious interpretation of any difference between them is that it reflects a real linguistic change.

	H	S	T	M	R	W
Non-contiguous	16	27	9	4	10	5
Contiguous	124	155	149	179	201	203
	140	182	158	183	211	208

	Group A: ave. %	Group B: ave. %
Non-contiguous	10.8	3.2
Contiguous	89.2	96.8

	χ^2	Degrees of Freedom	Probability
Within Group A	7.4	2	< 0.01
Within Group B	2.7	2	> 0.05

Interpretation: convergence

Table 3. Contiguity of subject and predicator in declarative affirmative clauses.

Table 3, which shows the incidence of the contiguous and non-contiguous arrangements of subject and predicator in declarative affirmative clauses, illustrates a situation of a different kind from those represented in Tables 1 and 2. Here, although group B appears to be statistically homogeneous, among the texts of group A there is a significant level of variation. In this case, the probability of such a distribution of frequencies arising by chance is less than one in a hundred. In Table 4, which indicates the incidence of inversion of the subject after an introductory adverbial in declarative affirmative clauses, the opposite situation holds: this time, it is group A which is internally homogeneous and group B which displays a significant level of variation. In these two tables, it

	H	S	T	M	R	W
No Inversion	27	34	34	109	61	49
Inversion	11	16	14	27	11	29
	38	50	48	136	72	78

	Group A: ave. %	Group B: ave. %
Inversion	69.9	76.6
No Inversion	30.1	23.4

	χ^2	Degrees of Freedom	Probability
Within Group A	0.1	2	> 0.05
Within Group B	11.9	2	< 0.01

Interpretation: divergence

Table 4. Inversion of the subject and verb after an introductory adverbial in declarative affirmative clauses.

is not possible to pool the figures for each group, since the two groups are internally dissimilar. Nevertheless, it can be said that Tables 3 and 4 represent genuine syntactic changes, though of a different kind from that suggested by Table 2. Table 3 would indicate a change from a situation of synchronic heterogeneity to one of synchronic homogeneity. A change of this type may be called a convergence. The opposite type of change, suggested by Table 4, from a situation of synchronic homogeneity to one

of synchronic heterogeneity, may be called a divergence. These two types of change have been presented as the interpretations of the respective tables.

A method of analysis has thus been developed which differentiates between three distinct types of change: shift, convergence and divergence. Moreover, the analysis of the corpus revealed a number of examples of shifts and several examples of divergences and convergences, apart from those illustrated here.

Let us refer again to Table 2, which concerns the relative position of predicator and direct object. In both groups of texts, the normal order of these two elements is the same; predicator precedes object. Moreover, the factors which give rise to exceptions to the normal order are also the same in both groups of texts: basically, the object precedes the predicator for the sake of emphasis or for the purpose of connectivity with what has gone before. Consequently, the shift suggested by Table 2 must be seen as a purely quantitative change. It follows that any theory which is to account for such a phenomenon must be able to accommodate change of a purely quantitative nature. Moreover, if a theory is to cope with divergences, the theory must not assume a homogeneous language community (cf. Weinreich, Labov & Herzog, 1968: 188). Clearly a theory which could be applied only to homogeneous communities could not handle changes involving significant increases or decreases in the level of quantitative synchronic variation.

Shifts, convergences and divergences, then, are quantitative changes in the grammars of language communities. The question now arises of how these changes relate to the competence-performance distinction. Clearly, they are detected by measuring actual data, so that changes at the level of performance are certainly involved. But are these performance changes associated with corresponding changes at the level of competence?

Chomsky (1965: 4) defines linguistic competence as 'the speaker-hearer's knowledge of his language', but this definition is based on the notion of an idealised speaker-hearer functioning in a completely homogeneous language-community (1965: 3). Such a view of competence is, therefore, not applicable in the present context. Certain other linguists, however, have developed alternative views of competence, views which do provide a suitable framework for discussing the status of the above-mentioned changes. In particular, Hymes (1972: 281-6), rejecting Chomsky's idealisations, has proposed the concept of communicative competence to refer to an individual's linguistic capabilities in a much broader sense than is covered by Chomsky's term linguistic competence. Communicative competence encompasses knowledge not only of what constitutes a grammatically well-formed sentence in the speaker's language, but also whether, and to what degree, particular

linguistic forms are feasible, appropriate in specific contexts, and (most importantly here) actually occur (note 3).

Hymes' notion of communicative competence is very useful in the present context in helping to clarify the status of the types of change with which this paper is concerned. It will be recalled that in a shift, the grammar of a particular variety of language at one period is characterised by a particular incidence of some syntactic feature, and by a non-significant level of variation in respect of the frequency-of-occurrence of the feature in question; a change then takes place, with the result that at a later period, the grammar of the same variety of language is characterised by a significantly different incidence of the syntactic feature, the level of synchronic variation still being non-significant. In a convergence, the grammar of a given variety at one period is characterised by a significant level of synchronic variation in the frequency-of-occurrence of some syntactic feature; a change then occurs, with the result that at a later period, the level of synchronic variation in the incidence of that feature has decreased to the extent that it is no longer significant. A divergence represents the opposite process to a convergence. Thus, the changes in question do not normally constitute changes in well-formedness conditions; that is to say, these quantitative changes do not generally produce a situation whereby a pattern which is grammatical at the earlier of two periods under investigation becomes ungrammatical at the later period, or vice versa. (A possible exception would be the case where a particular syntactic feature shifted from a positive to a zero incidence or from a zero to a positive incidence; but ungrammaticality and non-occurrence, though not totally unconnected, do not always go hand in hand (cf. Chomsky, 1957: 15-17). Nor do the above changes always involve the passage of a pattern from normal to marked status or vice versa. But despite the fact that they do not necessarily involve qualitative alterations to the grammar, to describe them as purely performance changes may be misleading. The relatively low level of inter-text variability in Table 2 (3.8% among the earlier texts and 4.1% among the later ones) indicates a high degree of regularity in performance among the authors within the respective groups, and as Cedergren and Sankoff (1974: 333-4) argue, it is difficult to avoid the conclusion that systematic features of performance, such as these texts appear to manifest, are reflections of competence. Of course, it is most unlikely that speakers are unconsciously aware of the exact incidence of any given syntactic feature within any particular variety, down to a fraction of a percent. But the statistical evidence quoted above does suggest that, within a particular variety of language, an average frequency-of-occurrence for certain syntactic features is systematically maintained within fairly narrow limits, and that changes in that average are readily measurable. Moreover, it is reasonable to suppose that the synchronic similarity in performance

exhibited by different speakers/writers, such as the authors of the above texts, is not mere coincidence, but is due to their underlying knowledge of the approximate incidence of particular syntactic features in a given variety of language. Such knowledge, insofar as it is possessed by a particular individual, constitutes part of that individual's communicative competence. Of course, the constraints that it imposes on performance are not so severe as to preclude characteristic individual differences or to prevent change. Moreover, when change does occur, it may take the form of a shift in the average incidence of some feature or of an alteration in the level of tolerated variation (as happens in the case of a convergence or a divergence). And although such change is actually detected via performance, it is plausible to suppose that it has an analogue at the level of communicative competence, affecting that part of communicative competence which constitutes knowledge of the extent to which particular forms of language actually occur. True, this competence-level change cannot be measured directly or precisely, but it can be inferred on the basis of observable change in performance. After all, it would be strange to claim that significant differences in performance between two periods could arise without any corresponding change in underlying competence.

It should be noted that both the performance-level and the competence-level changes of the types suggested here may well be gradual. However, neither level of change is detectable until it has proceeded far enough for significant differences to become apparent between groups of texts representing different periods.

The idea of quantitative changes in grammar is not, of course, new. However, as was implied above, in recent years most of the work on diachronic syntax has been concerned with qualitiative rather than quantitative change. Nevertheless, quantitative changes are not to be ignored. To restrict attention entirely to qualitative changes would be arbitrary and would result in a potential failure to account for significant differences between temporally distinct stages in the evolution of a language.

The method of analysis presented in this paper, with its capacity for distinguishing three different types of quantitative change, could no doubt be applied, with appropriate modifications, to other areas besides positional syntax. For example, it might, perhaps, be applied in other areas of grammar or at other levels of linguistic structure, or to the acquisition or breakdown of language. Even within diachronic positional syntax, however, there is no shortage of potential projects that might be undertaken using the quantitative method of analysis presented here.

FOOTNOTES

1. The helpful advice of Professor D. Crystal, Professor P. H. Matthews and Dr. D.J. Pike in connection with the research on which this paper is based is gratefully acknowledged. None of these is, of course, responsible for any errors contained in the paper.

2. Printed editions were used, and in the case of H, the MS. Bodley version was followed. Where two different editions of the same text existed, both were consulted, any discrepancies fortunately proving irrelevant in the present context.

3. Cf. Cherry (1957: 111), who states that 'We all possess immense mental stores of statistical data against which to judge a text.'

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REVIEW of Jim Schenkein, ed. Studies in the Organization of Conversational Interaction, New York: Academic Press, 1978. Ppxvi + 275.

This volume is a collection of ten papers representing work on conversation by those usually referred to as the conversational analysts or ethnomethodologists. This is not an introduction to conversational analysis (we note that Jim Schenkein has such a book in preparation), but a series of independent studies which share the same basic approach and analytic mentality. Most of the papers are previously unpublished. They openly acknowledge their debt to the teaching and writings of the late Harvey Sacks and more indirectly to Goffman's work on interaction analysis and the ethnomethodological studies of Garfinkel. There is a brief introduction by Schenkein outlining the nature of the type of studies presented here and a most welcome explanation of transcript notation, based mainly on the work of Gail Jefferson.

Two major themes run through these papers. One concerns the 'orderliness' of conversational interaction, the fact that it can be analysed and be shown to exhibit structure. This aspect coincides with the concerns of those linguists who are involved in investigating the structure of informal discourse. The other theme derives from the basic concern with conversation as an interactional activity and seeks to show that the structure which is manifested in conversation is something to which conversational participants orient and achieve as an ongoing process within conversational interaction. Here the interest is not in the structure of conversation but in conversation as a 'technical accomplishment'.

Goldberg's paper 'Amplitude Shift: a mechanism for the affiliation of utterances in conversational interaction' is concerned mainly with structure. She shows how conversation can be divided into sequences according to a speaker's peak amplitude level relative to his own preceding utterances. Sequence-initial utterances are raised in peak amplitude relative to the speaker's own prior utterances but the peak amplitude is decreased over the course of the sequence. Amplitude is seen as a means of affiliating or disaffiliating a turn with preceding turns, where affiliated turns are at a lower and disaffiliated turns, which are sequence-initial, are at a higher amplitude level. It is interesting to note that various embedded sequences such as repairs are treated as affiliates, i.e. related to previous utterances on the basis of their lower peak amplitude level, thus providing one possible solution to the thorny issue of whether to allow embedding in discourse structure. It would be fruitful to consider this approach in conjunction with the work of

David Brazil (1975, 1978) on discourse intonation and how this relates to exchange structure (Coulthard & Brazil, 1979).

The paper by Pomerantz, 'Compliment Responses: notes on the co-operation of multiple constraints', is also concerned with structure and deals with the types of responses or seconds which can follow compliments. Pomerantz claims that there are systems or options available as seconds to compliments such as agreement/disagreement and acceptance/rejection but that various constraints operate on their selection. For example, there is an interaction with a further system which involves the speaker's minimization of self-praise and the conflict can be resolved by selecting a form such as a praise downgrader which exhibits features of both forms. The selection of responses is described in terms of 'preference'. However, this term tends to be used in a confusing way in the literature. Here Pomerantz seems to use it in the sense of 'ideal' as opposed to actual behaviour (p. 80). In other places it seems to have the meaning of 'more frequent' as well as being used in the original sense (see e.g. Sacks & Schegloff, 1974) to describe features of turn organization. Obviously some clarification is needed for this widely used term if misunderstandings are to be avoided.

In his paper 'Identity negotiations in conversation' Schenkein analyses an encounter between salesman and client showing how both official as well as personal identities are revealed and negotiated during the course of the interaction. He then shows how unofficial identities are negotiated within sequences of the type:

> identity rich puzzle - pass - identity rich solution - comment

in which various embeddings are also possible. An 'identity rich puzzle' occurs when a referent is glossed over such that the recipient has to 'pass' or request clarification. Such a sequence seems remarkably close to the more general type of clarification or side sequence discussed elsewhere (e.g. Jefferson, 1972) and so the introduction of new terminology here seems poorly motivated. Indeed the use of the term 'identity', while showing the relation between interactional enterprises discussed in the earlier part of the paper and the structures proposed later, is confusing. Similarly the use of the term 'response-start' (p. 74), which is not explained in the text, but which seems to cover what functions as some sort of counter-formulation.

One of the most interesting papers is Jefferson and Schenkein's 'Some sequential negotiations in conversation: unexpanded and expanded versions of projected action sequences'. It deals with a sales appeal and how recipients pass and avoid the appeal. What is particularly interesting here is that this paper provides a possible way of bringing together the two themes of discourse structure

and interactional activity. On the one hand we have the notion of projected action sequences such as a sales appeal which consists of three moves:

> A : appeal - B : acceptance/rejection - A : acknowledgement

This type of exchange structure is familiar to discourse analysts. However the structure is open to expansion if, for example, the recipient of the appeal, B, passes, either by indicating that he is not an appropriate recipient of the sales appeal or by directing the appeal to a third party. The resulting structure thus allows embedding, with the original component parts maintained in the same order. However, the authors go beyond the discussion of structure to show its relationship to the interactional aims of the participants. For example, they show here how conversationalists orient to the structure by avoiding taking the critical acceptance/rejection slot which would then commit them to further activity. A similar analysis is made of correction sequences. Thus an important link is established between structure on the one hand and the way conversationalists orient to and accomplish this structure as an ongoing process which is determined by their respective interactional goals.

Three papers deal with narrative in conversation. Ryave ('On the achievement of a series of stories') shows how the telling of stories in conversation is an interactionally collaborative achievement, particularly in the case of stories in a series where a subsequent teller has the problem of relating to the preceding story. It is interesting that the data used derive from stories told by mentally retarded conversationalists who display a competence to manage stories in series as a 'situated achievement'. Sacks ('Some technical considerations of a dirty joke') shows how a joke is organized temporally and sequentially and contrasts joke-telling with story-telling. He also shows how a dirty joke can be a means of packaging and transmitting information, for example, in this case concerning daughter-mother relationships, the use of rules, the source and acquisition of information, e.g. about sex and marriage. However, while such information can be gleaned from a detailed analysis of the text, one wonders to what extent such an analysis is purely 'post-hoc'. Sacks claims that the particular components of the story are significant just because the story was told by adolescent girls and that the main effect of the story, the operation of a 'squelch' by one of the daughters in the story on her mother, depends on this. This does not, however, account for the fact that the story could be told by other groups (for example, in my own experience by a male academic in mixed student company - readers might wish to carry out their own experiments here!) and thus an entirely different analysis would be possible.

Finally, Jefferson's paper, 'Sequential aspects of story-telling in conversation', provides an extremely detailed

analysis of how stories emerge from turn-by-turn talk and then re-engage it on completion. Stories are shown to be triggered by preceding talk in which participants align themselves in various ways prior to the story's telling, e.g. by showing tokens of appreciation and understanding if they plan to become story recipients and by competing for turns as subsequent story-tellers. Thus stories are shown to be locally occasioned, but in a methodical way. The paper concludes with a detailed analysis of a story telling; but unfortunately space does not permit an account which would do justice to the detail of this analysis.

Two papers deal almost exclusively with conversation as an accomplishment. The paper by Atkinson, Cuff and Lee, 'The recommencement of a meeting as a member's accomplishment', shows how conversationalists orient to the interactional problems encountered at meetings, especially the problem of recommencing after a pause. They also point to the different possible interpretations of some of the talk which they analyse. This is also the concern of Sharrock and Turner who examine equivocality in 'On a conversational environment for equivocality', showing how participants design their talk to recognize and provide for potential equivocality. For example, in the case of telephoned complaints to the police, callers provide for the reasonableness of the call and foresee and remedy possible imputations that their complaint is malicious or vengeful in their choice of the particular events and persons they refer to and how they do so.

The final paper which I have to discuss is a variant version of the well-known and often cited paper on turn-taking by Sacks, Schegloff and Jefferson, 'A simplest systematics for the organization of turn-taking for conversation'. This paper is less concerned with the actual details of turn-taking (although these are dealt with as illustrations in the notes) than with providing a model to account for the interactional achievement of turn-taking in conversation. The model consists of two components. The first is a turn-constructional component by means of which turns are constructed in such a fashion that their possible completion can be projected by other participants who can then take their turn with a minimum of gap and overlap. The turn-constructional component is explained mainly in terms of syntactic units such as words, phrases and clauses, although the authors suggest that intonation must also play an important role. The second component deals with turn allocation and accounts for selection, or for the case where current speaker continues. The details of this model cannot be presented here and it is not possible without further detail to adequately exemplify the elegance and power of the model. As with several other papers, conversation is shown to be interactionally managed. Each turn is shown to be contingent on preceding contributions where intending speakers have to listen to and analyse preceding talk in order to manage the business of getting a next turn while at the same time displaying in their turn's talk their understanding of preceding turn's talk.

Finally, the authors make the important point that they see conversation as the basic form of speech exchange systems from which other systems derive. In this way they differ from others who study interaction in more restricted environments such as classrooms or interviews. Thus it might make sense to seek a model of interaction based on conversation as a primary form and then relate other forms of interaction to this rather than vice versa.

In summary, this is a useful collection of papers which warrant careful reading. Much of the work is tentative and exploratory and it is impossible to estimate to what extent it will eventually be superseded. Some of the papers provide extremely detailed analyses of talk which can be valuable in themselves, but without providing a more general explanatory account. Others, such as those by Jefferson and Schenkein and by Sacks, Schegloff and Jefferson, provide us with models which enable us to take our analysis of conversation further beyond the mere accumulation of the description of data. What we now await is some attempt to coordinate this enterprise. This is lacking in Schenkein's brief introduction to this collection, but we eagerly await it in his forthcoming introductory volume on conversation analysis.

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REVIEW of Malcolm Coulthard and David Brazil — Exchange Structure, Discourse Analysis Monographs 5, University of Birmingham, English Language Research, 1979, pp.50, £1.

This is one of the latest monographs in the series published by English Language Research at the University of Birmingham. Previous issues have been on discourse intonation (also by Brazil), and scientific and literary texts. The monographs are concerned in general to develop the approach to discourse analysis proposed by Sinclair and Coulthard (1975). In this monograph, Coulthard and Brazil (henceforth C & B) aim to develop considerably the concept of exchange structure proposed for teacher-pupil interaction by Sinclair and Coulthard (1975).

The basic concept underlying their approach to discourse is the concept of continuous classification. Each utterance in a sequence classifies the next one: it sets up predictions and expectations. Any utterance may occur, but whatever does occur is interpreted in the light of what was expected. The aim is therefore to describe the predictive power of the structural frame (pp.2, 15-16) in discourse sequences.

From this general concept of discourse structure, C & B criticise ethnomethodological work on conversation, review a few reasons for regarding discourse as a level of linguistic representation, and summarise some of Brazil's previous work on discourse intonation.

Proposal for exchange structure

The main proposal in the monograph is a structural statement about exchanges, and I shall concentrate on this. An exchange is defined as the basic unit of interaction (p.26), consisting minimally of a contribution from each of two participants: an initiation followed by a response. Exchange is then seen as a rank in the rank scale:

lesson
transaction
exchange
move
act

although C & B admit that the evidence for linguistic structure above the exchange is dubious.

The main proposal about exchange structure is encapsulated in this structural statement (p.46):

(O)I(R/I)R(F)(F)(C)

where I = initiation
R = response
F = follow up
R/I = response/initiation
O = open
C = close
() = optional item

Two features are used to define elements of structure (p.39): whether an item predicts that another item will follow, and whether an item is itself predicted. This gives, logically, a matrix which defines four moves.

	predicting	predicted
I	+	-
R	-	+
F	-	-
R/I	+	+

This is an interesting and precise attempt to define a set of general possibilities for an exchange. The idea is to start from basic interactional features: does anything precede/follow this utterance? And then to define exchanges on this basis. But in C & B's attempt, there appear to be the following problems.

(1) There appears to be no way to define O and C with these feature specifications. O would receive the same specification as I, and C would be the same as F. This implies that O and C are not places in exchange structure. In addition, O and C do not fit into exchange structure, since the sequence

I R/I R F F

predicts the sequence of turn-taking, with different moves being spoken by different speakers. But OI and FC, for example, could be uttered within a single turn. This implies that different things are being confused within a single structure: turn-taking and transmission of knowledge.

Incidentally, there is still no way of distinguishing O from I, and C from F, even if the feature matrix is expanded as I propose below.

(2) One of the most interesting observations which C & B make (p.43) is that as the exchange progresses, the available options decrease. They suggest that eliciting and informing moves characteristically occur only once each and in this sequence:

e1 i1 e2 i2

where e1 = elicitation seeking major information
i1 = inform giving major information
e2 = elicitation seeking polarity information
i2 = inform giving polarity information

Major and polarity information are not closely defined, although it is clear what is meant in general terms, and the observation is intuitively appealing. But the sequence

e1 i1 e2 i2 ack ack

(where ack = acknowledge) which is proposed as the maximum sequence, does not tally with the proposed exchange structure:

I	R/I	R	F	F	
e1	i1	e2	i2	ack	ack
	?	?	?		?

This is a second indication that the exchange structure they propose is wrong as it stands.

(3) R/I is defined as +predicted, yet given as optional in the structural statement. C & B here appear to be treating discourse as product, not process. That is, if, in a given piece of data R/I occurs, then it occurs in response to a preceding I. But it need not have occurred. (C & B previously, p.3, criticise Schegloff for treating discourse as product in his analysis of insertion sequences.) In any case, it is intuitively odd to regard an item as predicted but optional.

One solution would be to add + or -initial to the defining features: R/I could then be defined as -initial and -predicted, but +predicting.

	predicting	predicted	initial
I	+	-	+
R/I	+	-	-
R	-	+	-
F	-	-	-

An alternative proposal for exchange structure

This expanded matrix allows various exchanges, for example, I R, I R/I R, I R F, and so on. And it rules out several combinations, for example: *I R/I. The general possibilities are:

I (R ⟩⟨ R/I R) (F)

where linked brackets (⟩⟨) mean that at least one or both items must occur. The definitions allow for recursion of some moves, so the structure becomes:

$I\ (R \rangle\langle R/I\ R)^{n}\ (F^{n})$

where n means optional recursion.

The revised structure now fits the maximum sequence of elicitations and informs which C & B propose:

I	R	R/I	R	F	F
e1	i1	e2	i2	ack	ack

And the following structures, amongst others, are also allowed:

I	R	or	I	R
e1	i1		e2	i2

I	R/I	R
e1	e2	i2

The revised proposal also fits the following genuine data:

A.	what time is it	I	e1
B.	five fifteen	R	i1
A.	is it	R/I	e2
B.	yes	R	i2
A.	thanks	F	ack
B.	ok	F	ack

Note that this piece of data is a counter-example to C & B's own proposed exchange structure.

If we expand the matrix with the feature + or -initial, then logically we have four further possibilities for combining features:

		predicting	predicted	initial
1.	R2	+	+	-
2.	INF	-	-	+
3.		+	+	+
4.		-	+	+

Possibilities 3 and 4 are logically contradictory: an item cannot be both initial and predicted. Possibility 2 could define an Inform, as in lecturing, where no R is expected: this would in effect allow exchanges with a single item, and the concept of a non-interactive exchange. It would also allow INF (F^n), so the exchange is potentially interactive.

Possibility 1 would define the central move in a three-part exchange, for example, a pupil's response to a teacher's question:

T. what's the capital of France?

P. Paris

T. right.

C & B would analyse this as I R F. I would analyse it as I R2 R.

In exchanges such as

T. what's the capital of France?

P. is it Paris?

T. yes.

C & B analyse this as I R/I R, arguing that the pupil's response explicitly requests a response. But the third move is obligatory in either case. The correct analysis would seem to be to give both exchanges the same structure, and to state separately that syntactic choices between declarative, interrogative and moodless are neutralised in place 2.

These alternative proposals for exchange structure are discussed in more detail in Stubbs (in prep.).

Concluding comments

I have made several criticisms and adaptations of C & B's proposals. But the monograph has the very considerable merit of immediately suggesting such adaptations. The work is precise and suggestive, and immediately leads on to other closely related structural proposals. The monograph is full of insights, only some of which have been mentioned here. There are interesting suggestions about the exchange as a basic unit of information, and about the relation between exchange structure and discourse intonation: both topics where discourse analysis can contribute significantly to central linguistic problems. Such proposals deserve close attention and development by other linguists.

ACKNOWLEDGEMENTS

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