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COMPUTATIONAL APPROACHES TO LANGUAGE

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1. Introduction

Language is a very complex phenomenon, and it is therefore reasonable to employ, in the study of language, the best tools available for dealing with complex systems. This leads naturally to the idea of using computers and computing techniques. However, the relationship between computational and theoretical linguistics has altered in various ways over the past thirty years, and it is important, when assessing any computer-based (or computationally-inspired) research into language to take into account the methodological assumptions of that work, since the role of the computer may differ quite radically in different approaches. In this brief review, the emphasis will be on exactly these aspects - what part is played by the computer in the research, and what connection the work has with more conventional theoretical linguistics. There will also be a strong bias, in this survey, towards what is often called 'natural language processing'; that is, the attempts to make computers 'understand' or 'produce' fluent sentences. Thus much of what is called 'computational linguistics' will be dealt with only in a rather sketchy fashion.

2. Machine Translation

When computers first became available, in the early 1950s, there was an assumption that language was relatively simple, and that it would be straightforward (if somewhat tedious) to make the new machines process language in various ways. In particular, machine translation seemed to be an obviously useful application, and the U.S. government put a great amount of funding into research in this area (in fact, Chomsky began his work during this period). There was, however, no detailed, rigorous or adequate theory of language (either syntax or semantics), and attempts to design translation systems without this basis proved unsuccessful (see Bar-Hillel 1960).

Machine translation went into abeyance in the early 1960s (except in some Eastern European countries, where work continued), but there is now a renewed interest, for various reasons. There are several commercial MT systems available (mainly from North America) which work in various restricted ways. One of the biggest and most widely used ('SYSTRAN' see Toma 1977) is a large, complex, ill-understood piece of

software which has evolved over many years and which is quite difficult to modify or adapt to new material. Some systems need extensive human pre-editing or post-editing, which may not be a major problem if the material is already highly stylised (e.g. technical documents). One large corporation in America now has all its service manuals written in a special simplified form of English, which is amenable to machine translation by existing systems without much pre-editing. (It also, as an added bonus, is much easier for humans to translate when this need arises). The European Community is currently setting up a vast MT project, aimed at building a pan-European automatic translation system, with modules for each language being designed in each home country (see Rolling 1978). This wondrous creation (if it is ever completed) should be able to translate any text in any EC language into any other EC language. Such an aim is, in the current state of knowledge, slightly ambitious.

A later approach to machine translation was put forward by Wilks (1968). Since these ideas are usually discussed in isolation from machine translation (as linguistic proposals in their own right) they will be covered in Section 9 below.

Virtually no MT system uses a linguistic theory as such. Ideas may be borrowed from linguistic research (see section 7 below), but it would not be true to say that any of these systems (or proposed systems) actually implement or depend on any conventional linguistic theory.

3. Text Crunching

A computer is an ideal tool for handling data in vast quantities, and this has naturally led to its use in such tasks as compiling indexes for books, making collocations, determining authorship of historical texts, lexicography, etc. While linguistic theory may provide a framework of categories within which tasks can be defined and organised, this form of 'computational linguistics' is very different from those summarised in Sections 5 - 9 below, in which a complex amount of grammatical information is used by a computer in order to extract some form of 'meaning' from a coherent text (or, in some cases, to create a coherent text on some topic).

There is also a fairly minimal amount of cross-fertilisation here between computer science and linguistic theory - the computer is used as a fairly basic tool, and does not in itself contribute much to our understanding of human language (cf. the claims cited in Section 9 below).

4. Grammar Testers and Support Software

One kind of program which is occasionally written to assist with linguistic research is the grammar-testing program. If a grammar is very large and complex (as the grammar of any reasonable subset of English would be), it is very hard to decide, just by inspecting the grammar, exactly how all the

rules will interact. It is almost impossible to know whether a particular sentence is correctly described, or even described at all, if there are several hundred rules. The obvious answer is to use a computer program to check the grammar, by having it apply all the rules in all the allowable ways, thus constructing a list of the sentences covered by the grammar (together with their grammatical descriptions). This has been tried surprisingly rarely within linguistics, partly because of the historical separation between linguists and computer scientists in the academic world. A more important factor (in impeding the construction of grammar-testers) is the usual lack of precision in linguistic theories. It is very rare for a theoretical linguist to define concepts like 'grammatical rule', 'allowable application of a rule', 'grammatical derivation', etc. in sufficient detail and precision to allow a suitable program to be written. Much of Chomsky's early work on transformational grammar seemed frighteningly mathematical to some linguists, but in fact most of the notions in common usage within transformational grammar in the 1960s had never been fully defined. When Friedman (1971, 1972) designed and implemented a transformational grammar-testing program, it was necessary to fill in many details of the theory first, since the existing 'definitions' left many gaps.

Again, in this kind of work, the computer technology is acting solely as a device to handle complexity, and provides no theoretical novelty (except insofar as it forces the linguist to define his terms properly).

Closely allied to the grammar-tester is general-purpose software for linguistic research. A linguist who is interested in computer-testing of his grammar may find it useful to have various computer facilities available while writing the grammar (e.g. dictionary management, a pattern-matcher for rules). In a sense, such aids would probably only be useful in conjunction with a full grammar-tester, but they are mentioned separately here to emphasise the fact that a computer is not just useful to test a complete end-product; the use of a good interactive software environment can ease grammar-writing greatly.

Recent (and current) work at Edinburgh by Thompson (1981) is a good example of this use of modern software facilities to aid the theoretical linguist. As Thompson's system is designed to allow the construction of parsers for the style of grammars being developed by Gazdar and others (Gazdar 1981a,b), this research might be regarded as an implementation of a linguistic theory (as in Section 8 below), but this is slightly misleading, as Gazdar's theory does not yet make any detailed claims about the parsing component. Hence, Thompson's parser is compatible with Gazdar's theory, rather than embodying the linguistic theory itself.

5. Early Ad hoc Systems

In the early 1960s, a few isolated NLP programs were written (see Feigenbaum and Feldman 1964, Minsky 1968, for the main examples) but there was little coherence or theoretical basis to the field. Most of the NLP programs were intended to carry out some task other than parsing (e.g. problem-solving, question-answering), and in fact did not perform any true 'parsing' of their input sentences. Instead, they employed crude searches for keywords or patterns in the input string. One program from this period which is worth mentioning is the ELIZA system of Weizenbaum (1966, 1967), since it carried the keyword approach to an absurd (but impressive) extreme. It carried on a 'conversation' with a user, via a terminal, about any topic that the human chose, and never seemed lost for a response. The program was based on very simple tricks, and its responses were of two kinds. They were either stock phrases (e.g. 'Why do you think that?') or standard patterns with fragments of a previous input sentence inserted into them (e.g. 'What makes you think that...?', 'Tell me more about...'), with various adjustments (e.g. changing 'my' to 'your').

These techniques (with a few enhancements) produced an amazing level of fluency, but it would be difficult to argue that the program was 'understanding' to any degree. This illustrates the difficulty of judging a program by its output, or of defining 'understanding' in terms of behaviour. Later programs using similar techniques were able to give convincing impressions of a psychotherapist and of a paranoid person (see Boden 1977, chapter 5, for a good discussion of this kind of program). As Wilks (1981) points out, it is slightly ironic that very recent work (by Schank and others), which is supposed to extract the deep meaning of a text, actually relies on key-word based parsing similar to these early techniques.

6. Practical Front-Ends

One obvious use of computer-understanding of natural language is in the construction of better man-machine interfaces. Any computer system that has to be used by people who are not computer-programmers will seem easier to use, and 'friendlier', if it can converse in reasonably fluent English. Various dialogue interfaces have been constructed throughout the years (see Simmons 1965, for summaries of early work), and these have generally had the following characteristics:

(a) The fact that a restricted subject-matter was involved allowed various simplifying assumptions in the grammars.

(b) The need for a practical working system was of greater importance than the desire to explore theoretical aspects of language.

(c) The output performance (sentence generation) often looked impressive but depended on the use of stored phrases, rather than subtle sentence generation.

The LUNAR system (Woods et al. 1972, Woods 1973) is one of the best known question-answering systems of the early 1970s. It contained a data-base of information about moon-rock samples, and could be interrogated by ordinary users (geologists, etc.) in fairly natural English. The grammatical apparatus used was of more theoretical interest than most, since it did at least use a Chomskyan 'deep structure' as an intermediate form (which was then translated into a data-base query in a special-purpose programming language). Woods (1975b) has argued that attempting to solve problems of natural-language understanding from an 'engineering' point of view may throw light on theoretical issues in quite a profound way, for the following reason. If a grammatical technique is devised simply to cover the data in an elegant fashion (as in linguistics), then it has no explanatory value - it has that form because the linguist saw that as the best way to describe things. On the other hand, a solution designed with efficiency in mind (as in engineering) which also happens to cover the data elegantly, offers a certain functional explanation - perhaps the reason that the patterns occur thus is that language has evolved within efficiency constraints. This is an interesting outlook, but there are some dubious aspects to it. In particular, are the efficiency considerations which arise in a practical project with current software for sequential digital computers likely to be similar to the efficiency factors for the human mind?

Leaving aside the question of explanation, there is the interesting point that a long-term engineering approach might benefit from the adoption of some of the methodological criteria applied by theoretical linguists. A conventional grammarian tries to construct descriptions which are as general (in the sense of covering a wide range of data) and as elegant (in the sense of internal coherence and simplicity) as possible. If a computer program for understanding English sentences is to be robust and extensible, these are highly desirable qualities. In fact, generality and elegance are guidelines for good programming in any area - when the topic is grammatical coverage, the goals of the linguist and the long-term interests of the engineer can be seen to converge in this respect.

The idea of using natural language as a medium of communication with machines is perhaps overrated. Natural language is a highly imprecise system, which can be used with great effectiveness by humans because of the large amount of reasoning and world-knowledge which they bring to bear on problems such as disambiguation, filling in unspecified details, etc. Unless the machine with which we are conversing is 'intelligent' enough to perform at human level in these various supporting areas, the communication may be quite confusing. Stylised notations (e.g. programming languages, query languages) may not be quite as 'friendly' as English, but at least they make it easier to be sure of getting across precisely what you mean.

There is still an immense amount of work going on in the U.S.A. on practical front-ends. Many of the systems rely heavily on the point (a) listed above, and build their whole grammar around categories which are specific to the subject-matter involved (e.g. Burton 1976). Others accept the methodological importance of grammatical cleanliness and generality (as commented above) and are working on the development of theoretically respectable parsers. Work at SRI, Stanford, has followed (and is still following) all these possibilities (Hendrix et al. 1978), and sophisticated long-term research is being carried on at Bolt Beranek and Newman (Bobrow and Webber 1980a, b, Brachman 1979).

7. Partial Use of Linguistic Theories

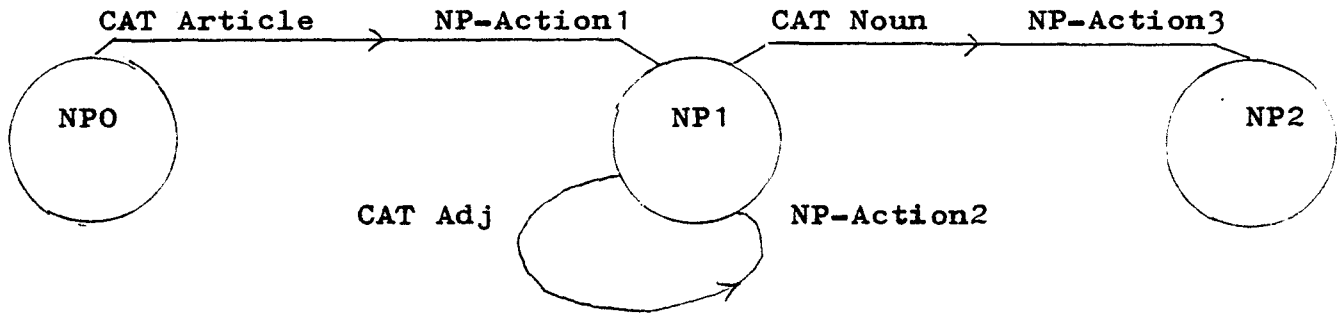
After the early stage mentioned in Section 5 above, it became more common for programmers to take inspiration from, or give credit to, theoretical linguistics. Surprisingly, this sometimes led to confusion and misleading claims.

There were attempts to implement Chomskyan transformational grammar fairly directly in parsing programs, during the 1960s (see Section 8 below), but these were generally not very successful, owing to the computationally impractical nature of transformational grammar as a parsing technique. This led to the use of a much more adequate compromise, whereby Chomskyan deep structure was adopted as the desired output for the parsing program, but with the conversion from input words to deep structure being achieved by any means that was practical, rather than by using transformations in their strict sense (as in the Woods system mentioned in Section 7 above). For example, both the LUNAR system and the project of Thorne et al. (Thorne, Bratley and Dewar 1968, Dewar, Bratley and Thorne 1969) used a very efficient machine implementation of a parsing technique which later came to be known as an 'augmented transition network (ATN)' grammar (see Woods 1970, Ritchie 1978a), and built a labelled tree-structure with markers attached to show both the deep and surface positions of 'moved' constituents.

In an ATN grammar, the possible ways of parsing a sentence are represented as a set of directed labelled networks, which display the possible orderings of constituents in a sentence and the various options the parser will have at any stage in the processing. The parsing program scans the networks as it works through the sentence, making choices and carrying out actions as specified by the networks. The network grammar can be thought of as a highly specialised flow-diagram.

For example, a simple noun phrase could be described by the network:

Noun Phrase:



The circled points in the network are called 'states' and the connecting lines are known as 'arcs'. The interpretation of this network is roughly thus:

> When at state NP0: if the next word is in Category 'Article', perform NP-Action1 and move on to state NP1.
> When at state NP1: if the next word is in Category 'Adj', perform NP-Action2 and return to state NP1;
> if the next word is in Category 'Noun', perform NP-Action3 and move to state NP2.

(The ATN notation can be thought of as an enhanced version of that used for finite-state interpreters). The actions on the arcs can be tree-building operations, or any other actions that the parser designer thinks suitable. The ATN interpreter has several storage locations (usually referred to as 'registers'), which can be used to hold half-built structures, or other working data. This allows the parser the freedom to do any computation at all (not just building a simple tree left-to-right). In particular, constituents can be 'moved' to more suitable places, in a manner reminiscent of a 'reverse transformation'. The tests on the arcs (e.g. CAT) can also be for a specific word (e.g. WRD 'to'), or can refer to a phrase or clause category. This latter facility (known as the PUSH arc) is the way that constituents within constituents can be processed, as follows. As the parser works through the sentence, it is likely to encounter constituents (i.e. phrases or clauses) inside each other. For example:

> 'The man [who you met] gave the daughter [of the host] a present'.

This nesting may occur to some depth:

> 'I told Alf that [you thought that [Bill knew.....]]'.

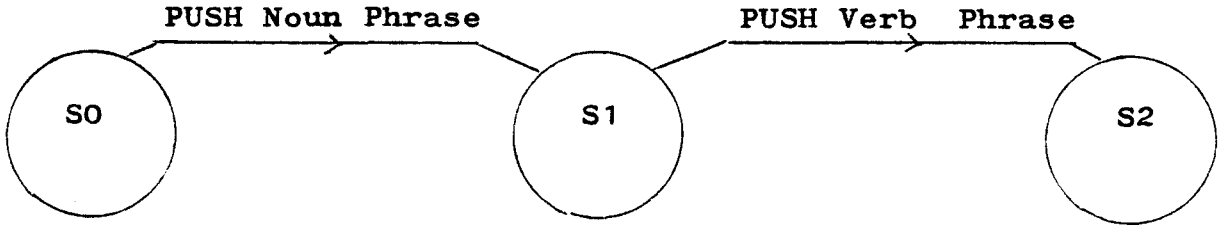
Hence, the parser has to have some way of suspending the constituent it is working on, parsing the inner phrase, and resuming where it left off with the outer phrase. This is achieved in the following way. The parser contains different procedures for parsing different types of constituent, and

these are called by each other (recursively if necessary). Hence, the 'Noun Phrase Procedure' can call the 'Relative Clause Procedure', thereby causing a relative clause to be processed within a noun phrase.

In a simple parser, the tree-building can be directly linked to the flow of control between the different parsing procedures. That is, each procedure can attach its own result (a subtree) to the main tree as it finishes. In this way, the tree will automatically build up, reflecting the way that the parsing procedures were called.

In an ATN grammar, each network can be thought of as a parsing procedure, and the PUSH arc is taken as an invocation of another network. For example, the following network specifies that a Noun Phrase should be sought first, then a Verb Phrase.

Sentence:



The ATN grammar should then contain other networks, labelled 'Noun Phrase' and 'Verb Phrase', which can be scanned by the parser while it is carrying out the PUSH arcs. The temporary use of these other (sub)networks before returning to the S0-S1-S2 network is exactly analogous to the calling of parsing procedures described above.

The parser may find, in some states, that the current input (word or phrase) could match more than one of the outgoing arcs. Even if the sentence is not ambiguous as a whole, it may not be possible for the parser to resolve (locally and immediately) which of the possible paths through the network will eventually be correct. The designer of the ATN interpreter has to allow for these choice-points to be controlled systematically; there are two common ways of doing this:

(a) Depth-first. The parser arbitrarily chooses one of the options and continues. If the chosen option proves incorrect, the parser has to 'backtrack', undoing all the intervening processing and trying another option. This has certain advantages - only one analysis tree needs to be built at a time, and if the parser always 'guesses' correctly it will complete the analysis quickly. On the other hand, wrong guesses lead to gross inefficiency, with work being undone and redone. Also, if the sentence is wholly ambiguous (i.e. there are a few valid meanings for the entire sentence), the only way to find all the meanings is to keep backtracking.

(b) Breadth-first. The parser considers all the options in parallel, building separate trees for each possibility. Failures (i.e. wrong guesses) result in the discarding of the corresponding partial trees. The advantage of this is that it does not use expensive backtracking, and if a sentence is wholly ambiguous, then all the possible analyses will be found as a matter of course. Its main disadvantage is that it entails maintaining several trees at once.

The ATN notation does not itself specify whether a depth-first or a breadth-first search should be used - it is neutral between these.

The famous program of Winograd (1972) used remarkably similar techniques, in that he wrote his parsing rules in a specially developed programming language ('PROGRAMMAR') which provided most of the same facilities as the Woods 'ATN grammar' parser. Winograd did not claim to build a deep structure in the Chomskyan sense, but his trees were in fact a kind of compromise between deep and surface structure, since they were lavishly labelled with syntactic features, some of which furnished information about the 'deep' position of constituents such as 'wh'-phrases. The linguistic credit for Winograd's structures was given to Halliday (1967a, b, 1968), but careful examination of Halliday's work (and the Winograd account) shows that in fact all that was borrowed from Halliday was a descriptive notation ('system networks', which can be used to show how different grammatical categories relate to one another) and the general guideline of using broadly branching ('bushy') syntax trees rather than the narrower trees favoured by transformational grammarians. This program ('SHRDLU'), which had an overwhelming effect on research into natural language processing, was a dialogue system which could converse with a human user about a simple table-top world containing building blocks. The program had a (very crude) simulation of a 'hand' and 'eye' which it could use within the simulated 'BLOCKS world'.

The syntax tree (described above) was acted on by various 'semantic specialists' (LISP procedures) which constructed 'semantic structures', represented as expressions or commands in another special-purpose programming language, Micro-Planner. As in Woods' LUNAR system, the system evaluated the pieces of Micro-Planner program in the computational environment of the BLOCKS database, and this constituted the 'response' to the original input sentence (e.g. examining the world model to find something, or carrying out a command in that world). This arrangement allowed such conversational exchanges as:

pick up a big red block,
OK
grasp the pyramid
I DONT UNDERSTAND WHICH PYRAMID YOU MEAN

what does the box contain?
THE BLUE PYRAMID AND THE BLUE BLOCK
what is the pyramid supported by?
THE BOX
how many blocks are in the box?
FOUR OF THEM

(See Boden 1977, chapter 6, for a brief description). The published account of the SHRDLU program contained a long conversation which Winograd had carried on with the program, annotated with his explanations of what the program was doing as it conversed. The dialogue looked very impressive, and it was largely this which led to the system being hailed as a great breakthrough (despite the lesson of the ELIZA program).

Partial implementation of a linguistic theory often occurs where a programmer requires some ready-defined concept (typically, some variety of syntax tree) which he can use in the design of his program. The necessary structure or concept is borrowed, sometimes without the other components of the linguistic theory, and confusion arises as to how much the implementation actually owes to the original linguistic model. This certainly seems to be what has happened in the case of the two systems described above, since these programs gave rise to a certain puzzlement which Wilks (1975c) sums up thus:

'Consider the following three assertions:

(1) Woods' system is in some sense an implementation of transformational grammar

(2) Winograd's work has shown the irrelevance of transformational grammar for language analysis - a view widely held by reviews of his work

(3) Woods' and Winograd's systems are formally equivalent - a view held by both of them.

There is clearly something of an inconsistent triad amongst those three widely held beliefs'.

Another way in which partial implementation seems to occur is by post hoc rationalisation. Sometimes a computational linguist will construct a program using his own intuitions about language, and then, in an attempt either to justify it on theoretical grounds or simply to explain it to others, he seeks a linguistic theory which seems to match the way in which it works. As computational linguistics has grown in confidence and originality over the years, this subservience to linguistic theory as a justification has largely died out, and workers in artificial intelligence are likely to feel that their methods stand or fall on their own merits (see Section 9 below).

8. Implementation of Linguistic Theories

There have been very few serious attempts to implement the full apparatus of a linguistic theory in a language-understanding program. In the 1960s, some attempts were made (e.g. Zwicky et al. 1965) to design parsers which operated using Chomskyan transformations (see King 1981 for a review), and work on this continued at IBM until the mid-1970s (see Plath 1973, Petrick 1973). The main problem with pure transformational parsing (i.e. using only the Chomskyan mechanism, with no short-cuts) was that attempting to match transformational rules to surface sentences led to a vast 'combinatorial explosion' (i.e. there were a vast number of possibilities to be tried). Transformations (as in 'Aspects') are defined as patterns to be matched against syntax trees, with manipulations on these items. If a sentence is the result of many rules having moved, deleted and appended material to the original deep structure tree, there is no easy way to pick out which rule to apply 'backwards' in order to start 'unwinding' the derivation from surface-to-deep structure.

The program of Davey (1974) might be regarded as an implementation of a linguistic theory. He was attempting to build a systematic model of sentence production, and found transformational grammar, as then formulated, very little help. Having put together a prototype program using various intuitions about the task in hand, he found some similarities to the Halliday-derived systemic grammar of Hudson (1971). The final version of the program was written completely in terms of Hudson's syntactic framework, although Davey was slightly doubtful about the usefulness of some of the constructs in the theory (e.g. those known as 'functions').

Davey's program played a game of noughts-and-crosses with a human (using the numbers 1 to 9 to label the squares of the board), and could give a commentary in fairly fluent (if somewhat cumbersome) English on a complete or partial game. For example:

> The game began with your taking a corner, and I took the middle of an adjacent edge. You threatened me by taking the end of the one adjacent to the corner which you had just taken and to the one which I had just taken the middle of but I blocked that, and you took the square opposite the one which I had just taken.

Sentence generation is a somewhat neglected aspect of natural language processing, and Davey's very impressive work has not been followed by further improvements in this field (but see Goldman 1975 for another major sentence generation program, and Boguraev 1980 for some proposals).

9. Computationally Inspired Theoretical Work

In the early 1970s, natural language processing began to move away from atheoretical implementations, and workers in artificial intelligence started making proposals for concepts and models which, although based on computational ideas, were intended to have theoretical significance. To a large extent, this change in attitude was brought about by the confidence induced by the superficially impressive dialogue produced by the program of Winograd (1972).

One of the most-quoted proposals from this period is the 'conceptual dependency' of Schank (1972). This prototype theory of language was based on the idea that natural language understanding should be viewed as a process in which meaning was central (rather than syntax) and in which the underlying meaning of a sentence could be represented in terms of combinations of a few basic 'primitive' entities and relations. Various programs were written to try out these ideas (see Schank et al. 1975), but none of them shed much light on the syntactic structure of language (not surprisingly, since the denial of the importance of syntax was a basic tenet of the theory). These programs included a few sentence-analysers (Reisbeck 1974, 1975a, b) and a sentence-generator, all of which interacted with a complex memory-and-inference program which manipulated the 'conceptual structures' used by the language processing programs.

The work of Wilks (1973, 1975a, b) is hard to categorise in terms of its methodology. It grew out of a machine-translation project in the mid-to-late 1960s, and so was originally developed as an engineering project (cf. sections 2 and 7 above). However, with the renewed linguistic interest in computational techniques during the 1970s, the ideas were usually discussed as theoretical linguistic proposals (although Wilks usually argued most points on the ground of practical issues arising in translation). It is, therefore, worth mentioning this work here for historical reasons. In Wilks' system semantics was claimed to be a central mechanism, and sentence-analysis was based on matching simple semantic patterns against the input sentence, using the notion of 'preference' between different possible matches (rather than simple outright rejection). The implemented version used a large number (several hundred) of 'primitives', which were atomic symbols such as 'MAN', 'FOLK', 'PART'. These items, when grouped into trees, made 'formulae', and each word-sense had a formula to represent its meaning. Thus, a word with several senses would have several different formulae stored in the dictionary. For example, Wilks (1979) shows two senses of the verb 'grasp' (namely, understanding an idea, and taking hold of a physical object). Each formula has a particular primitive which is its 'head' (usually at the top-right corner of the tree of primitives) and which gives the broad category that the sense falls into (e.g. for the two senses of 'grasp' the heads are 'THINK' and 'SENSE').

The processing rules include 'templates', which are patterns, usually of three primitives. The input sentence is passed through an initial 'fragmenter' which clusters the words into small phrases or groups. A template matcher then tries to find, for each fragment, a template (or several) which will match it, in the sense that three words in the fragment have formulae whose heads match those in the bare template. The resulting structure (i.e. template plus matching formulae) is a 'filled template', and the semantic representation of the string is given, at this stage, by the sequence of filled templates thus constructed. Further routines then try to find links between these filled templates in various ways, using (among other things) rules called 'paraplates' which specify how adjuncts may be fitted into case-slots (to use conventional terminology for a moment).

The essential characteristic of this system (other than its lack of emphasis on syntax) is the use of semantic 'preference'. Whereas many systems (e.g. Winograd 1972) use the linguistic notion of 'selectional restrictions' (Katz and Fodor 1963) to reject semantically anomalous constructions, Wilks' analyser merely prefers some combinations to others. In this way, slightly non-standard subjects and objects may be allowed (e.g. 'My car drinks gasoline'), but ambiguity is resolved by selecting the 'most preferred' reading. This assessment is done after the filled templates have been constructed, by checking how many of the 'preferences' specified in the formulae have been satisfied by the neighbouring items. Boguraev (1980) gives a good description of a program which combines the syntactic parsing techniques used in ATN grammars with the semantic structures of Wilks.

Marcus (1978a, b, 1980) carried out an interesting project to investigate whether English sentences could be parsed by a system which did not incorporate any of the traditional techniques for dealing with multiple analyses (e.g. depth or breadth first searching - see Section 7 above). Marcus' program was claimed to be 'deterministic', in the sense that it maintained only one analysis of the sentence as it scanned the words, and postponed all choices (e.g. concerning possible structural ambiguity) until a point where the 'right' decision could be made. (This is in contrast with what Marcus calls 'non-determinism', where decisions are handled by allowing choices to be made and then later revoked or discarded).

The program is purely a syntactic parser and the structures it builds are fairly conventional surface structure trees, annotated with features. Marcus discusses his system in terms of Chomsky's Extended Standard Theory, but the relationship between the program and EST is not very close. The parser does use surface trees similar to Chomsky's (although not identical), and relies on the notion of a 'trace' (see below) to describe certain phenomena, but this qualifies as (at most) a partial implementation of EST.

The program has a clean modular separation between grammar rules (written in a notation called 'PIDGIN'), and the interpreter which handles these rules. The rules specify how particular input words and phrases are to be used to build syntactic structure, and the interpreter controls the process of parsing, taking in input, matching rules against the input, etc. The rules contain two halves - test-pattern and a list of actions. The idea is that the interpreter keeps a list of 'currently active' rules, and whenever the test-pattern of a 'currently active' rule matches the input, the actions listed in that rule should be carried out. The parser maintains three temporary stores as it processes the string. These are:

(a) the words so far unused in the sentence (the 'input list').

(b) a 'buffer' of fragments (words and phrases) which the grammar rules have to process.

(c) a 'stack' of pieces of the syntax tree so far built.

The grammar rules have their patterns matched against the contents of the buffer, with more input items being taken in from the input list if necessary to fill up the buffer, and structure-building normally takes place on the tree-node which is currently at the top of the stack. The buffer has only 5 slots for items, and the parser can match against only 3 consecutive positions at a time (the 'current window'). Most of the grammar rules, therefore, have patterns which describe 3 items, although some have fewer, and some also describe the required form for the 'current node' (i.e. top of the stack).

The stack is a fairly conventional, last-in-first-out store, although there are certain ways of accessing stacked items other than the topmost (currently active) one. The parser may 'drop' the top item in the stack (the current node) back into the front of the buffer (left end), removing it from the stack as it does so. The next stacked item thus uncovered then becomes the current node. Similarly, the parser may insert lexical items into the buffer at arbitrary positions (e.g. 'to'), to enable certain rules to apply.

As mentioned before, the buffer has 5 cells, but the parser will be focussing on only 3 (the current 'window') at any given moment. Initially, the current window is the leftmost (front) 3 cells, but certain rules may cause, as a side-effect, an 'attention-shift', in which the parser slides its current window to the right. Once such a 'shift' has occurred, the items which are not in the new current window (e.g. the far left item) are not available for pattern-matching, until the window has been restored to a position in which the current window includes them.

The rules are organised into groups called 'packets', and whole packets move on and off the active list together. Each rule has a 'priority', which is a number between 0 and 1000, indicating the order in which rules should be tried. If two active rules match, the one with the lower number is used in preference to the other. For example, here is one of Marcus' rules:

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RULE TO-INFINITIVE IN PARSE-AUX
[=*to, auxverb   tnsless  -->
Label a new aux node inf.
Attach 1st to c as to.
Activate build-aux, cpool ]
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This rule is called 'TO-INFINITIVE' (just for mnemonic purposes), and is in packet PARSE-AUX. It has a pattern which matches the first two items in the buffer, and a list of 3 actions. No priority is specified, so a default value of 10 is assigned (i.e. this is equivalent to 'RULE TO-INFINITIVE PRIORITY:10 IN PARSE-AUX').

In the tree-structure produced by the parser, each node has a list of associated 'features' and also a list of what Marcus calls 'registers', which might be regarded as 'properties' on the nodes (and are not to be confused with ATN registers - see Section 7 above). These are arbitrary appendages (other than the necessary pointers to daughter nodes, parent nodes, etc.), such as miscellaneous information to link related parts of the tree. Although these are used to implement certain particular grammatical analyses, they are not used very often, and most nodes will have no 'registers' on them.

There are special nodes called 'traces', which look like NP nodes in many respects, but which have a 'register' pointing to another NP node (the 'binding' of the trace). This idea (which originates with work by Chomsky and others) is used to give a structure for clauses where there appears to be a 'gap' caused by a missing NP. For example:

'What did you give to Mary?'

In this sentence, the verb 'give' does not have a direct object in the normal position, since the phrase 'what' acts as the object (semantically and syntactically). This can be analysed by having a 'trace' attached as the object of 'give', with a register binding which points to the 'wh' phrase at the start of the clause.

Marcus' program is certainly an elegant and interesting piece of computational linguistics, but his main claim (i.e. that a non-trivial subset of English can be parsed in what he calls a 'deterministic' manner) is so far unproven. The published account of his program gives a list of sentences successfully parsed by his system, but this is not a wide enough range of data to convince a sceptic. Also, it is still unclear how

such a program could successfully parse a sentence which is wholly ambiguous (e.g. 'Visiting relatives can be boring').

Ritchie(1977, 1980) attempted to use some of the ideas that were in widespread use within artificial intelligence as the basis of a computational theory of language. This work was based on the methodology of using parsing programs as easily testable grammars, and showed that various English constructions could be elegantly described in processing terms. This work will continue over the next few years.

For some years (see Kay 1975), Kay has been working (at Xerox Palo Alto Research Centre) on the idea of a theoretically sound grammatical formalism which would allow linguistic grammars to be written in a way which permitted both parsing and generation from the same set of rules (something which existing linguistic formalisms do not normally allow). His current proposal is that syntax trees and lexical entries should be looked upon as lists of 'properties', and the task of parsing then becomes the merging together of the properties from the lexical items in the sentence into constituents, and so on. These structures fit very naturally into a sentence-generation algorithm, but for parsing the grammar has to be pre-processed (compiled) into a decision-network which embodies all the relevant choices for the parsing to proceed. The compilation is very slow, being a complex process, but the resulting parser is extremely fast.

10. The Future

Much of the work reviewed in this article is not recent, and in trying to assess the current relationship between computational and theoretical linguistics it is important to concentrate on the trends within the work of the past five years. As can be seen, there is an increasing desire by workers in the computational field to produce theoretically sound and interesting ideas based on grammars for parsing and generation (e.g. Marcus, Kay). Also, certain aspects of theoretical linguistics (e.g. the Gazdar-Thompson collaboration) show that linguists are moving away from the stance that computational linguists are mere rude mechanicals who must not be trusted with anything intellectually more subtle than a paper tape punch. Both these trends seem likely to benefit the cause of research into natural language.

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Abbreviations used:

IJCAI: International Joint Conference on Artificial Intelligence
AISB: AISB Conference on Artificial Intelligence
TINLAP: Workshop on Theoretical Issues in Natural Language Processing

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CLASSIFIER, NOUN, AND VERB IN THE EXPRESSION OF SPATIOTEMPORAL RELATIONSHIPS IN CANTONESE

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0. Problems connected with noun classification

This paper raises two connected problems which, though not central to the study of classifiers, may throw some light on the subject. These problems, involving the classifier, the noun, and the verb in the expression of spatiotemporal relationships, are the following:

(i) the existence of 'fuzzy sets' comprising words of indeterminate class membership;

(ii) adverbial function arising from the combination of a quantifier with a classifier, noun, or verb.

1. 'Fuzzy sets'

Although most classifiers fall neatly into either a sortal or mensural category (Killingley 1980b), some classifiers seem to belong to both these categories, and it is only in individual noun phrases that it is possible to decide whether such classifiers are being used sortally or mensurally. There remains a degree of movement between the two categories of sortal classifier and mensural classifier, which in other respects are settled and stable classes. Furthermore, although the classifier as a word class is by and large syntactically well-defined (Killingley 1980a), we are still left with borderline cases when we cannot decide whether a word is a classifier or a noun. This problem will be discussed in relation to spatiotemporal words (1.1), the unclassified noun (1.2), and the use of nouns as mensural classifiers (1.2.1.).

1.1 Spatiotemporal words

Spatiotemporal words form a 'fuzzy set' in the study of classifiers, opinion being devided as to whether they should be treated as nouns or classifiers. Their treatment, as Greenberg has shown, must depend on the particular language being studied. Burling (1965:244) had held that many numeral

classifier languages of Southeast Asia did not permit the occurrence of a number without a classifier. But Greenberg rejects this view as one which would lead to too rigid a definition of a numeral classifier language since there are, in certain numeral classifier languages

> particular classes of noun, e.g. measures, units of time, and the word 'time' in such phrases as 'three times' which hardly ever occur with classifiers (Greenberg 1972:5).

As an example of a language with an extensive group of such nouns, Greenberg cites Vietnamese. However, elsewhere, Greenberg (1972:29) supports Burling in treating the spatiotemporal words of another language as classifiers rather than as nouns:

> ...Burling (1961:266) in his grammar of GARO analyses these words [i.e., spatiotemporal words] as classifiers without head words while noting that in previous grammars of the language they had been analyzed as head nouns without classifiers.

So as a language universal, we should not expect one answer as to how potential members of this fuzzy set of nouns/classifiers should be treated. As we have just seen, even in the same language (Garo), different treatments of the same phenomenon have been proposed and presumably found to be acceptable at different times. One explanation for this may be that the members of such a fuzzy set exhibit different syntactic properties at different times, sometimes appearing to be more like classifiers, and at other times appearing to be more like nouns.

In Cantonese, there are two kinds of words referring to time, only one of which need concern us here, although the other kind will be mentioned. They are (i) words which indicate duration of time and (ii) words which identify and indicate points or divisions of time along a time continuum; these divisions could in themselves be periods of time (and therefore durational), seen from another angle, but their main function is that of dividing up time. Examples of (i) are <u>say3</u>[1] 'incarnation', <u>doy4</u> 'dynasty'. Since such time words are members of the fuzzy set of classifiers/nouns, we shall be chiefly concerned with them. Examples of (ii) are <u>jiw1jow2</u> 'morning', <u>maan3hag1</u>, <u>maan3taw5</u> 'dark, night-time'. Unlike the first kind of time word, these time words are clearly time adverbs, and they normally do not occur with quantifiers. However, one or two may occur with the quantifier <u>seng5</u> 'all' or <u>yad1</u> 'one', but then only with durational and deictic, not enumerative, meaning, e.g. <u>seng5 maan3hag1</u> (but not *<u>seng5 maan3taw5</u>) '(during) the/that whole night', <u>yad1 maan3hag1</u> '(on) that night/(on) a certain night' (cf. English '<u>one night</u>, something happened',

in which the adverbial, a seemingly enumerated noun phrase 'one night' has deictic, not enumerative, meaning).

Among category (i) time words, a minority take the classifier go3 and clearly occur as nouns, e.g. ngaan3jaw3 'afternoon', lay3baay3 'week', yued4 'month'. One or two other time words in this category, depending on the speaker, may be used either with or without the classifier go3, e.g., miw4jung1 'second', fan1jung1 'minute'. However, the majority of such time words do not occur with a classifier, and thus may be treated either as special temporal nouns without classifiers or (after Greenberg's preferred treatment of Garo by Burling referred to above) as classifiers without head nouns. Most writers of teaching books and dictionaries do not make a distinction between time words which behave more like nouns and those that could be either nouns or classifiers, labelling them indifferently as nouns. This kind of treatment is seen, for example, in Cowles (1965). Lau (1972a, 1972b, 1977 and 1979), using a slightly different treatment, regards time words which do not take classifiers as nouns without classifiers, as verbs, or as adverbs. At any rate, he does not consider the possibility that they might be classifiers without noun heads. A few others, however, notably Huang (Huang 1970, Huang and Kok 1973), distinguish between time words which are nouns and time words which are classifiers. Furthermore, in Huang (1970), there is an implicit distinction between such words (labelled 'noun' and 'measure' [i.e., classifier]) and our time adverbs referred to above as category (ii) time words. Those time adverbs, which mark points along a time continuum, are labelled by Huang simply as TW's (time words), and not as nouns or measures. Huang's treatment of words referring to time may be exemplified in his labelling of the words lái̍h.baai [lay3baay3] 'week' and yuht [yued4] 'month' as 'nouns' (Huang 1970:415, 459), the words yaht [yad4] 'day' and nìhn, nín [nin5] 'year' as 'measures' i.e., classifiers (Huang 1970:452, 428), and the words gàm.yaht [gam1yad4] 'today', máahn.tauh.hāak [maan3taw5hag1] 'night, evening, night-time' as 'time words' (Huang 1970:385, 419). This seems to be a very sound division of such words, although Huang runs the risk of puzzling his readers by not explaining his criteria. Briefly, the distribution of words denoting time is as follows: the majority of those words which denote duration of time (our category (i) mentioned earlier) occur immediately after the quantifier and are not normally followed by a noun. So instead of the expected structure Q(quantifier) - Cl(assifier) - N(oun) (see Killingley 1980a:1.2), we have a structure which could be interpreted either as Q - N (favoured by people like Lau) or Q - Cl (favoured by people like Huang). However, as we saw above, a minority of these words (e.g. lay3baay3 'week' and yued4 'month') do not occur immediately after the quantifier, as one would expect, but must have the classifier go3 between them and the quantifier (i.e. occurring in a Q - Cl - N structure). Thus we can see

why writers on the subject are undecided about what to do with words denoting duration of time, although it is harder to see why most writers treat them as nouns when only a few of them clearly have the syntactic properties of nouns. For this reason, Huang's treatment of this semantically similar class as two syntactic classes (noun and measure [classifier]) is the better one, although, as we shall see later, there are shared syntactic affinities between them. Also justified is Huang's labelling of our category (ii) words, those denoting points along a time continuum, as 'time words', a separate category from noun and classifier. These words do not share the syntactic features of most of the durational time words. They could in fact be labelled as special unclassified temporal nouns (since they do not take classifiers) which have adverbial function.

Of our category (i) time words denoting duration of time, most of those that occur immediately after the quantifier (i.e. interpreted variously as Q - Cl or Q - N) but not those with an intervening classifier go3 (i.e. obviously with the structure Q - Cl - N) may be used as classifiers[2] in certain constructions which express events measured in periods of time, emphasizing the duration of such events. Examples are 'liong3 nin5 beng4' 'two years of illness', 'ng3 say3 fu2' 'five incarnations of suffering' (i.e. suffering spanning five incarnations). In other words, used in this way, the element which seems to be either a classifier or a noun when it occurs just with a preceding quantifier is clearly a mensural classifier measuring periods of time in which an event occurs. This is one reason why it would be better to treat such words as classifiers rather than nouns. However, one problem is that the few category (i) durational time words which occur with the classifier go3 and which semantically belong to this group of words cannot occur as mensural classifiers in this way. For example, we cannot say '*saam1 yued4 beng4' to express 'an illness lasting three months'; instead, we use a classified noun phrase as a clause adverbial: 'beng4jo2 saam1 go3 yued4' '(somebody) was ill for three months'. The restriction on using yued4 as a mensural classifier could perhaps be explained away by saying that with cardinal numbers up to twelve, this restriction prevents any confusion with the acceptable clause '[koey3] saam1 yued4 beng4' ' he was ill during March (i.e. the third month)'. But this does not explain why we cannot use such time words with cardinal numbers greater than twelve (in the case of yued4 'month') or seven (in the case of lay3baay3 'week'). Another problem is that while the category (i) temporal words occurring immediately after the quantifier may combine with single or consecutive numerals to form adverbial constructions (see section 2), the temporal words with an intervening go3 may not. For example, we can say yad1 ci3 liong3 ci3 'once or twice', yad1 yad4 'one day', but we cannot say *yad1 lay3baay3 liong3 lay3baay3 when we mean '(in) one or two weeks'; we would have to say either 'yad1 liong3 go3 lay3baay3' or 'yad1 go3 lay3baay3 liong3 go3 lay3baay3'. That is to say, with a word like lay3baay3 'week', the sortal classifier go3 must be used, which suggests that words like lay3baay3 are clearly nouns.

In spite of the differences in syntax seen in the two kinds of our category (i) temporal words, their semantic identity in denoting durational time argues strongly for their being considered as members of one large class of special classifiers which normally do not occur with noun heads. We shall call them 'spatiotemporal classifiers'. However, since a few members of this semantic class (e.g. lay3baay3 'week', yued4 'month') behave syntactically as nouns in occurring with the classifier go3, we shall consider the possibility that the members of this special spatiotemporal classifier class are being redistributed into two classes: classifiers and nouns, the majority remaining in the classifier class. One or two members may be in either class, depending on the speaker, as evidenced by free variants like yad1 fan1jung1/yad1 go3 fan1jung1 'one-minute/one-classifier-minute' (a minute). Among those that are in the classifier class are members of a small subclass especially associated with verbs, which normally only appear in the structure Q - Cl (not Q - Cl - N) in adverbial function. These spatiotemporal classifiers are also concerned with time duration, but with the kind of relatively short duration in connection with the performance of single or repeated actions. They are used in the quantification of actions, and will be dealt with in 2.1.2., 2.1.3., and 2.3. It would be interesting to see how our category (ii) time words referring to points on a time continuum fit eventually into this scheme of things.

1.2 The unclassified noun, the confusion of certain numerals with the unclassified noun, and the use of some unclassified nouns as classifiers

Nearly all nouns in Cantonese may be used either with or without classifiers. In general, the classified noun is used to express specific reference while the unclassified noun is used to express generic reference. However, as I have shown elsewhere (Killingley 1980a:1.4), an unclassified noun may express either generic reference or specific reference, depending on the context. For instance, yan5 in the sentence yan5 how2 may refer to men in general or to a particular man, depending on whether the sentence yan5 how2 means 'Man is good' or 'this/that man is good', each meaning being context-bound. Caysac (1926:25) seems to have been thinking of what I here call generic reference in relation to the unclassified Cantonese noun when he says that

> On n'emploie jamais le classificateur quand on parle d'une façon vague, indéterminée ou générale d'un ou plusieurs objets...

However, his examples of the unclassified noun used in speaking in 'une façon vague', could, as in my example yan5 how2, have both a generic and a specific interpretation.

In one example, yan$_1$ yao$_2$ ling$_1$ sing^3 [yan5 yaw3 ling5sing3] 'l'homme est raisonnable', yan5 could be referring to men in general or to a particular man. But in another example, Iou^3 koung^1 king^3 T'in^1 Tchu^2 [yiw3 gung1ging3 tin1jue2] 'il faut honorer Dieu', it seems clear that tin1jue2 has specific (not generic) reference (i.e. 'God' **rather than** 'a god' [in the sense of 'any god']), and is at the same time a very special kind of proper noun. So while the generic/specific distinction can be made in terms of the unclassified/classified noun in general, we must be careful not to make this distinction invariably.

Sometimes a writer will claim that such and such a noun has no classifier, a claim that may be the result of a mistake on the part of the writer concerned. We should, therefore, be careful not to take such a claim seriously, and at any rate should be prepared to check each example given in support of such a claim. One unreliable source is Lau (1973), his listing of nouns without classifiers being rather erratic. For example, in Lau (1973:98), woo^4 jiu^1 fan^2 [wu5jiw1fan2] 'pepper' is so listed, although it takes the generic classifiers did1, jung2 as well as the sortal classifier lab1. However, Lau's listing of certain spatiotemporal words as nouns without classifiers is understandable. In view of what we have been discussing in 1.1. concerning the fuzzy set of classifiers/nouns, it is reasonable that Lau (1973:30) lists nin^4 [nin5] 'year' as a noun without a classifier (although in my treatment nin5 would be a classifier without a noun head).

One puzzling and unjustifiable practice is Lau's inclusion of certain numerals in his list of nouns without classifiers. Thus in Lau (1973:2), baak^3 [baag3] 'hundred' and in Lau (1977:544), maan^6 [maan4] 'myriad' are listed as both adjective and unclassified noun. Leaving aside the mistaken analysis of these words as adjectives[3], since this is not central to our argument here, there can be no justification for treating such words as nouns. There is some justification for Huang's treatment of a word like maan4 as either a numeral or a classifier (Huang and Kok 1973:382), since, as we saw in 1.1., the spatiotemporal words which normally follow such a word (which I would call the numeral) have uncertain classified/noun status. That is to say, in a phrase like cin1 soey3 maan4 soey3 'thousand-ages-myriad-ages' '(in) a thousand or ten thousand years', it could be argued that soey3 is an unclassified noun occurring immediately after the numerals cin1 and maan4. However, soey3 is probably a classifier without a noun since one can say koey3 yaw3 cin1/maan4 soey3 meng4 'he has a thousand/ten thousand years of life'. Furthermore, soey3 patterns with other obvious classifiers like jeg3 (cf. 'gey2 do1 jeg3' 'how many?', 'gey2 do1 soey3' 'how old?'). But however we decide to treat the fuzzy set of spatiotemporal words, a problem gone into in 1.1., as either nouns without classifiers or as classifiers without nouns, it seems clear that the words for 'hundred', 'thousand' and 'ten thousand' should be treated as numerals, not as nouns

(Lau's treatment) and probably not as classifiers either (an option in Huang's treatment). For instead of baag3, cin1 and maan4, any other numeral may be substituted.

In fact, there seem to be very few nouns which never take classifiers, and it is very tempting to think of such nouns as being potentially members of a fuzzy set which might well qualify as classifiers without head nouns. An example is yib4 'page of a book', which is justifiably entered in Lau (1977:931) as an unclassified noun. yib4 does not usually occur with a numeral since it is not the word used when pages are being counted. Thus, although one can use the indefinite numeral gey2 with yib4 in referring to a few pages, one is more likely to find yib4 occurring with a deictic word or a Wh-word, e.g. go2 yib4 'that page', bin1 yib4 'which page?'. In counting pages, another word for 'page', pin1 (homophonous with the sortal classifier for nouns referring to compositions), is used with a numeral. Like yib4, pin1 may also occur with a deictic word or a Wh-word, and like yib4, pin1 does not occur with a classifier. So if we want to regard words like yib4 and pin1 as nouns, we must remember that they are very rare. Are they in fact nouns, are they unstable nouns moving into the classifier class, or can they even be established classifiers without noun heads (like the category (i) time words dealt with in 1.1.)?

1.2.1. Nouns used as mensural classifiers

Perhaps the three alternatives proposed immediately above should be viewed, not as three mutually exclusive states, but as three stages in the development of certain nouns into classifiers. That is to say, perhaps words like yib4 start off by being special nouns not requiring classifiers, then move into a fuzzy set having classifier/noun status, and finally become identified with classifiers not requiring noun heads (i.e. syntactically like the spatiotemporal classifiers denoting time duration dealt with in 1.1.). One reason for considering the possibility of a movement from noun to classifier status in borderline cases like yib4 is that there is already a tendency for certain nouns to be used as if they are mensural classifiers, to express overflowing containment or location. This is comparable to the mensural use of our spatiotemporal classifiers to denote the duration of events, as in 'liong3 nin5 beng4' 'two years of illness' (1.1.). Nouns occurring in this kind of way are restricted in their co-occurrence with premodifiers as well as noun heads. They may be preceded only by the quantifiers yad1 'one', seng5 'all' and a deictic word. Unlike real classifiers, they may not be preceded by numerals greater than one, the indefinite numeral gey2 'a few', or by a Wh-word. Only a restricted class of nouns may be used mensurally, e.g. 'yad1 sam1 si4' 'a heart (full of) anxiety', 'seng5 san1 nay5' '(one's)whole body (stained with) earth', and 'yad1 saan1 mug4' 'a mountain (full of; covered with) trees'.

In fact, Caysac (1926:25) does not distinguish between this kind of structure and what I have elsewhere (Killingley 1980a, 1980b, 1980c) treated as normal mensural classification, e.g. as in yad1 tung2 soey2 'a can of water'. Although there are parallels between nouns being used as mensural classifiers and mensural classifiers proper (we might even consider the one as the historical antecedent of the other), the two categories should be kept distinct at the moment, although later on they may become indistinguishable. One clear syntactic difference between them is that while nouns used as mensural classifiers have very restricted premodification, established mensural classifiers, whether denoting quantity, or (as in 1.1.), duration of an event, may be preceded by the full range of pre-classifier modification.

2. Adverbial function

Certain adverbial phrases and clauses are formed by the combination of the numeral with noun, verb or classifier. The classifier may be an ordinary sortal or mensural classifier, or it may be a member of the special fuzzy set of spatiotemporal classifiers described in 1.1., classifiers denoting duration of time. However, in all the cases involving a spatiotemporal classifier below, that spatiotemporal classifier must be the kind that has more settled classifier status, not the kind that sometimes behaves like a noun by taking the classifier go3. The numeral combines with the noun, verb or classifier in a number of ways to form the following adverbials:

(i) adverbials of frequency of action (2.1.1.-2.1.3.);
(ii) adverbial of isolated or unrepeated action (2.2.);
(iii) adverbials of limited quantity (2.4.1.-2.4.2.);
(iv) adverbial of time as process or duration (2.5.2.-2.5.3.);
(v) adverbial of time as precursor to consecutive action (2.6);
(vi) adverbial of time as location or duration of action (2.7.);
(vii) adverbial of instrument or concomitant cause (2.8.).

2.1. Adverbials of frequency of action

Adverbials of frequency express in approximate or exact terms the number of times an action is repeated. As we can see from (i) above, there are three ways of forming an adverbial of frequency. Since an adverbial of frequency may indicate the first of a series of repetitions of an action (i.e. in a series 'once, twice, etc.'), one must not confuse such an occurrence of an adverbial of frequency with an adverbial of unrepeated action (listed under (ii) above). In the latter case, the action occurs once and for all.

2.1.1. Numeral + agent or instrumental noun

This is a comparatively rare type of adverbial formation,

involving a numeral and a few nouns denoting agents or instruments of action. Semantically, there are similarities between this kind of adverbial and the adverbial of instrument or concomitant cause described in 2.8. Examples of this kind of adverbial are 'koey3 hod3 yad1 seng1' 'he-called-one-voice' (he called once),'dam2 koey3 gey2 coey5' 'hit-him-few-fists' (hit him a few times). This kind of adverbial has been referred to by Greenberg (1972:30) for Mandarin:

> There is also the use of nouns which are neither general for all verbs like 'time' in English nor cognate verbal nouns, e.g. Mandarin kànle liáng-yěn "looked two eyes" 'looked twice'.

However, there is no Cantonese phrase exactly corresponding to the Mandarin one quoted by Greenberg.

2.1.2. Correlated consecutive numerals + certain unrepeated or repeated spatiotemporal classifiers especially associated with verbs

Frequency of action is often expressed in approximate terms by means of two combinations of correlated consecutive numerals with a member of a small subclass of spatiotemporal classifiers which are especially associated with verbs (see 1.1. and Hashimoto's 'verbal classifiers' in 2.3.). The most well-known members of this subclass are haa3[4], baay2 and ci3 (2.3.1.). The two consecutive numerals may occur adjacent to each other to form a disjunctive phrase, immediately followed by a single occurrence of the spatiotemporal classifier, e.g. 'koey3 tiw3 saam1 sey3 haa3' 'he-jump-three-four-haa3' (he jumped three or four times). Alternatively, the spatiotemporal classifier is repeated after each consecutive numeral e.g. 'koey3 tiw3 saam1 haa3 sey3 haa3' 'he-jump-three-haa3-four-haa3' (he jumped three or four times). However, combinations of adjacent consecutive numerals to form disjunctive phrases which are homophonous with other numeral words are avoided. We would say gaw2 baay2 sab4 baay2 'nine-baay2-ten-baay2' for 'nine or ten times' instead of *gaw2 sab4 baay2 'nine-ten-baay2' since the latter sounds like gaw2sab4 baay2 'ninety times', where gaw2sab4 is a word, not a disjunctive phrase. This phonological restriction applies in every case where a disjunctive phrase is formed by the combination of two adjacent consecutive numerals. Furthermore, there are lexical constraints on the occurrence of certain verbs with certain spatiotemporal classifiers. For example, ley5 'come' may not occur with haa3.

2.1.3. Numeral + certain spatiotemporal classifiers especially associated with verbs

Frequency of action may be expressed in exact terms by means of a combination of a simple numeral and a member of the subclass of spatiotemporal classifiers mentioned in the last section, keeping in mind that there are lexical constraints preventing the co-occurrence of certain verbs with certain spatiotemporal classifiers. An example of this kind of adverbial of frequency is 'bey2 ngo3 tay2 yad1 haa3' 'let-me-

look-one-haa3' (let me have a look; let me look once).

2.2. Adverbial of isolated or unrepeated action: yad1 'one' certain unaspected verbs of momentary action following the main verb in a clause: yad1 + haa3

In Cantonese, a common adverbial is the adverbial of isolated or unrepeated action, termed 'temporary action' by Hashimoto (1972:25). However, it is more accurate to label it an adverbial of isolated or unrepeated action since it presupposes an isolated but complete and final action, not a temporary one. Unlike the last construction dealt with in 2.1.3., only the numeral yad1 'one' may occur in construction, and we should distinguish between this construction and the last when yad1 occurs in that construction as part of the meaning of 'once'. In this construction, yad1 occurs with certain unaspected verbs of momentary action or with haa3 to form a phrase which immediately follows the main verb in a clause. We should distinguish between this adverbial phrase and the adverbial clause of time as precursor to consecutive action described in 2.6. In that construction, which is also formed by yad1 as an unaspected verb, the structure is a subordinate clause which is immediately followed by the main clause in the sentence. It does not, as in the present case, form a phrase immediately following the main verb in a one-clause sentence. An example of the adverbial of isolated or unrepeated action is 'tay2 yad1 tay2/haa3' 'look-one-look/haa3' (have a look; look once). Unlike the construction in 2.1.3., combinations of these verbs with numerals greater than one are not possible. Not every verb can combine with yad1 to form an adverbial of isolated or unrepeated action; examples of this lexical restriction are combinations of yad1 with ley5 'come' and hoey3 'go'. But the combinations of these verbs with yad1 to form an adverbial of time as precursor to consecutive action (to express 'as soon as [somebody] came', 'as soon as [somebody] went') is, of course, a different matter.

2.3. The term 'verbal classifier'

The adverbial of frequency of action and the adverbial of isolated or unrepeated action are semantically similar to the Mandarin adverbial referred to by Greenberg involving a numeral and an agent and instrumental noun, together indicating frequency (see 2.1.1.). In Cantonese, however, the combination of a numeral with such a noun results in an adverbial of instrument or concomitant cause, not an adverbial of frequency (see 2.8.). Because in constructions like the ones set out in 2.1.1. and 2.1.2., and in Greenberg's Mandarin example, verbal actions are being quantified in some way, the term 'verbal classifier' has been used by different people, though not always with identical meanings.

Greenberg (1972:30). in referring to the Mandarin adverbial involving the numeral 'two' and the noun 'eyes' following the verb 'looked' to express 'looked twice', suggests that

> The logical possibility exists...that a language might have a system of verbal classifiers each of which would be used with a particular class of verbs and an accompanying numeral.

Hashimoto's treatment of words like haa3 shows that Greenberg's proposed logical possibility is a real possibility in Cantonese and the other Yue dialects described by Hashimoto. Hashimoto (1972:25) uses the term 'verbal classifier' to refer to words like haa3, and although her usage of the term is not exactly the same as Greenberg's, they seem to be thinking basically of the same kind of thing. In Hashimoto's treatment, words like haa3 combine with the numeral yad1 'one' to express what we here call isolated or unrepeated action (Hashimoto's 'temporary action'), and they combine with numerals greater than one to form a 'frequency expression' (Hashimoto 1972:25). Furthermore, Hashimoto refers to haa3 as the 'general verbal classifier', although her reasons for doing so are unclear.

The term 'verbal classifier' is a very useful mnemonic term since it emphasizes the quantification of verbal actions rather than the quantification of nouns. However, as a syntactic term, it should be used as a distribution class label rather than as a word class label since its membership is not limited to the members of just one word class, but is drawn from members of different word classes. In Greenberg's Mandarin example, the verbal classifier is a noun yěn 'eyes'; but with the numeral i1 'one', the verbal classifier could also be a verb, as in k'an4 i1 k'an4 'look-one-look' (have a look; look once). In the case of Cantonese, the verbal classifier could be a member of our special subclass of spatiotemporal classifiers especially associated with verbs (i.e. Hashimoto's 'verbal classifiers', which exclude verbs), or a verb. These members of the two word classes form a distribution class because of their co-occurrence with a numeral to form adverbials of frequency or isolated action. Very rarely, one of these spatiotemporal classifiers occurs as a verbal classifier without an accompanying numeral. This may be explained in terms of numeral deletion. For instance, Hashimoto points out that when the numeral is 'one' and the 'frequency expression' occurs before the object,'the numeral "one" may be elided, leaving the verbal classifier alone in front of the object' (Hashimoto 1972:25-6). However, the numeral yad1 'one' may only be omitted in certain rare cases, Hashimoto's examples ʔhA: [haa3] and ɔts'A:n [jan4] having this possibility, but omission of yad1 before baay2 and ci3 would not be possible. In fact, jan4 is very different

from the other spatiotemporal classifiers which combine with numerals to form adverbials of frequency or isolated action since it may only be preceded by the numeral yad1 'one' (see 2.3.2.). So it seems as if there is room for subdivision among Hashimoto's 'verbal classifiers'. We must not confuse the term 'verbal classifier', which names a distribution class, with the more familiar term 'classifier' (or 'numeral classifier'), which names a word class. Neither must we assume that because classifiers have the syntactic structure Q(quantifier)-Cl(assifier)-N(oun), the verbal classifier has a parallel structure Q-Cl-Verb. Verbal classifiers, whether drawn from verbs or from the subclass of spatiotemporal words associated with verbs, can only have the structure Q-Cl[5]. And sometimes the quantifier can only be yad1 'one'. We shall now look in greater deatil at the subclass of spatiotemporal words associated with verbs (i.e. Hashimoto's 'verbal classifiers') which I treat here as one part of our distribution class of verbal classifiers.

2.3.1. haa3, baay2 and ci3

In our subclass of spatiotemporal classifiers especially associated with verbs forming part of our distribution class of verbal classifiers is a subset consisting of haa3, baay2 and ci3. These spatiotemporal classifiers can all be preceded by any quantifier or disjunctive numeral phrase to form adverbials of frequency expressing in exact or approximate terms the number of times an action has occurred, or the number of occasions on which an action (or event) has occurred. Examples are 'aay3jo2 yad1 haa3/baay2' 'shouted-one-haa3/baay2' (shouted once), 'ngo3dey4 gin3go3 yad1 baay2/ci3' 'we-have met-one-baay2/ci3' (we have met once). It is probably the case that haa3 is only used in adverbials referring to momentary actions (like shouting, falling down, hitting somebody), ci3 is only used in adverbials referring to an enduring action or event (like coming, going, meeting somebody socially), while baay2, overlapping with both haa3 and ci3, is used to refer to actions and events which are either momentary or enduring. These lexico-semantic constraints result in the unacceptability of sentences like '*ley5go3 saam1 haa3' to mean '(somebody) has been three times' (baay2 or ci3 must be used instead of haa3) or '*dam2 koey3 gey2 ci3' to mean 'hit him a few times' (haa3 or baay2 must be used instead).

In 2.2., we saw that the adverbial of isolated or unrepeated action could be formed by combining yad1 'one' either with certain verbs of momentary action or with the spatiotemporal classifer haa3. In other words, as implied in 2.2., those verbs of momentary action which combine with yad1 'one', together with haa3, form a sub-distribution class of verbal classifiers. This sub-distribution class is a smaller class within the distribution class of verbal classifiers

which includes the special spatiotemporal classifiers haa3, baay2, etc., and a subclass of verbs (but not confined to verbs of momentary action).

baay2 and ci3 may also be used with the numeral yad1 'one' to form an adverbial denoting 'once', or 'on one occasion'. But since the numeral in this construction can be potentially greater than one, which is not possible in the above case with haa3 or a verb of momentary action, we do not consider baay2 and ci3 as members of the sub-distribution class.

2.3.2. paay5 and jan4

paay5 overlaps with baay2 and ci3, but not with haa3. paay5 is used in adverbials referring to more enduring lengths of time than adverbials formed with ci3, which refer to an occasion or occasions when something has occurred. However, unlike baay2 and ci3, paay5 does not occur with quantifiers but only with deictic words and Wh-words, e.g. 'yi1 paay5, san1ji2 m5how2' 'this-paay5-health-not good' (recently [i.e., for some time, stretching up to the point when the utterance is made], my health has been bad). This can be contrasted to the less enduring time expressed by using ci3 in 'bin1 ci3 saang1yi3 how2' (on which occasion did my business flourish?).

jan4 overlaps semantically with paay5 but syntactically with haa3, baay2 and ci3. Like paay5, it denotes an enduring length of time, but like haa3, baay2 and ci3, it may be preceded by a numeral. However, that numeral may only be yad1 'one'. In fact, jan4 is very much on its own, although, as we saw in 2.3., it is grouped together with haa3 as a 'verbal classifier' by Hashimoto. jan4 may also occur with yad1 in an unreduplicated form to mean '(in) a while' or in a reduplicated form to mean 'bit by bit', 'little by little' in relation to the passage of time. Examples are 'dang2 yad1 jan4 'wait-one-jan4' (wait a while) (using an unreduplicated form), 'koey3 yad1 jan4 yad1 jan4 seng2wan5' 'he-one-jan4-one-jan4-become conscious' (he became conscious little by little [i.e. as time passed]) (using a reduplicated form).

2.4. Adverbials of limited quantity

Adverbials of limited quantity express the performance of certain actions measured in terms of single units or units made up of small numbers or amounts.

2.4.1. Reduplication of the phrase yad1 'one' + ordinary classifier

Most sortal or mensural classifiers may combine with yad1 'one' in a reduplicated classifier phrase to express the

performance of an action measured in terms of single consecutive units. Examples are 'yad1 go3 yad1 go3 ning1hoey3 cue5fong2' 'one-go3-one-go3-take towards-kitchen' (take [them] one by one to the kitchen), 'go2 po1 sue4 yad1 ceg3 yad1 ceg3 jaam2dow3log4 dey4' 'that-classifier-tree-one-foot-one-foot-cut down towards-ground' (that tree was cut down to the ground foot by foot [i.e. by degrees]). Although most classifiers may enter into this and the next kind of adverbial construction, there are certain lexico-semantic constraints barring certain classifiers from occurring in these constructions. For instance, bung4(B), which classifies coey5 'stench', may not occur in these ways.

2.4.2. Correlated numerals yad1 'one' and liong3 'two' + a repeated ordinary classifier

Most classifiers may occur in this kind of construction, which expresses not only the performance, but the completion and finality of an action[6], measured in small units. This completion and finality are partly expressed in conjunction with the verb, which must be used in the completive aspect with this adverbial, e.g. 'koey3 yad1 go3 liong3 go3 saad3saay3 koey3dey4' 'he-one-go3-two-go3-has completed killing-them' (he killed them all eventually, in small numbers). So although yad1 and liong3 have the lexical meanings 'one' and 'two' respectively, in this adverbial construction, these lexical meanings must not be taken literally. A careful distinction must be made between this kind of adverbial and the limiting phrases yad1 + classifier and liong3 + classifier, which may be followed by a noun head in each case, e.g. 'yad1 go3 [yan5]' 'one-classifier-person' (a person, one person), 'liong3 go3 [yan5]' 'two-classifier-person' (two people). In these phrases, the numerals yad1 and liong3 could be replaced by a Wh-word or a deictic word to give us phrases which mean 'which person?', 'that person', etc. But in the case of the adverbial of limited quantity, no such substitution of the numerals yad1 and liong3 is possible.

2.5. Adverbials of time as process or duration

These adverbials of time express in exact or approximate terms the length of time in which an action takes place. Alternatively, they express the duration of an event. They may be formed by means of various combinations of the quantifier with the spatiotemporal classifier, as shown below.

2.5.1. Quantifier +spatiotemporal classifier

When a quantifier combines with a spatiotemporal classifier, an adverbial of time as process is formed which expresses the exact or approximate length of time in which an action is performed. Whether the length of time is exact or

approximate depends on the quantifier, being exact if the quantifier is a definite numeral and approximate if the quantifier is the indefinite numeral gey2 'a few'. If the quantifier is seng5 'all', the length of time specified may be exact or approximate depending on the context, since seng5 may not always have the literal meaning 'all'; it may be a hyperbole meaning 'a long time' (cf. all in 'don't be all day eating up your greens'). Examples are 'nim4 saam1 yad4 ging1' 'recite-three-days-prayers' (pray for three days), 'koey3 seng5 yad4 ngam5cam5' 'she-whole-day-grumbles' (she grumbles for a whole day; she grumbles all the time [i.e. very often]).

2.5.1.1. Conjoined temporal phrase

The temporal phrases in the last section may be conjoined to express time as process or duration. The quantifier in each conjoining phrase may be the same or they may be different, but if the spatiotemporal classifiers are semantically paired 'opposites' like yad4 'day' and ye4 'night', and jiw1 'morning' and maan3 'night', the quantifier must be the same. Examples are 'sab4 say3 gey2 cin1 doy4 ney3 wuy3 bin3faan1 yan5' 'ten-incarnations-a few-thousand-generations-you-will-change again-person' (in ten incarnations and after a few thousand generations, you will become a human being again), 'haam3jo2 saam1 yad4 saam1 ye4' 'has cried-three-days-three-nights' ([she] has cried for three days and three nights).

2.5.2. Reduplication of the phrase yad1 'one' + spatiotemporal classifier

This temporal phrase expresses time as process in limited stretches of repeated time. In structure it is parallel to the formation of the adverbial of limited quantity described in 2.4.1.; semantically, there are also parallels, except that here, the time in which the action occurs is being measured, not the goal of action. An example is 'yad1 doy4 yad1 doy4 say3gaay3 joen3bow4' 'one-generation-one-generation-world-improve' (the world improves generation by generation).

2.5.3. Correlated consecutive numerals + an unrepeated or repeated spatiotemporal classifier

This temporal phrase expresses time as process or duration in terms of limited stretches of approximate time. In structure, it is parallel to the formation of the adverbial of frequency described in 2.1.2., in which two correlated consecutive numerals combine with certain repeated or unrepeated spatiotemporal classifiers especially associated with verbs. As in that adverbial of frequency, this adverbial of time as process or duration has two possible combinations of correlated numerals with the spatiotemporal classifier,

although this time, the spatiotemporal classifier is not especially associated with verbs. The two consecutive numerals may occur adjacent to each other to form a disjunctive phrase, immediately followed by a single occurrence of the spatiotemporal classifier, e.g. 'yad1 liong3 say3 bin3faan1 si1ji2' 'one-two-incarnations-change back-lion' (in the time spanned by two incarnations/after one or two incarnations [as something else, he] changed into a lion again).

2.6. Adverbial of time as precursor to consecutive action: yad1 'one' + unaspected verb

Unlike the other adverbials that we have been dealing with, this adverbial of time as precursor to consecutive action is an adverbial clause, not an adverbial phrase. The combination yad1 'one' with an unaspected verb is a very productive formation, not only in Cantonese, but in Mandarin and other Chinese languages as well. It acts as a subordinate clause predicating an action which is immediately followed by another action or event predicated in the main clause. Since many verbs are homophonous with classifiers, this construction could affect the syntactic properties of classifiers in the future, especially in the various combinations of the classifier with yad1 'one' in adverbial formation, e.g. 'yad1 coed1, jaw4 m5ho2yi3 yab4faan1maay5ley5' 'one-go out-immediately-unable-come in here again' (as soon as [you] go out, you will not be able to come back in here again). Here, the verb coed1 'go out' is homophonous with the sortal classifier coed1, which classifies nouns referring to films and other forms of drama, such as daay4hey3 'Chinese opera'.

As mentioned in 2.2., the adverbial clause of time as precursor to consecutive action must be distinguished from the adverbial phrase of isolated or unrepeated action, formed by the combination of yad1 'one' with certain unaspected verbs of momentary action, resulting in an adverbial phrase which occurs immediately after the main verb in a one-clause sentence.

2.7. Adverbial of time as location or duration of action: yad1 'one' or seng5 'all' + low4

low4 is a special case of a spatiotemporal classifier belonging to the fuzzy set dealt with in 1.1. exhibiting both the characteristics of classifiers and nouns (but in this study treated as special classifiers without noun heads). Unlike the other members of that fuzzy set, most of which can occur with the full range of quantifiers as well as the Wh-words and the deictic words[7], low4 can only occur with the quantifiers yad1 'one' and seng5 'all' to form an adverbial of time as location or duration of action/event, the action/event being restricted to what takes place on a journey. This low4 has obvious historical and semantic links with the

homophonous and homographic noun low4, which has its own sortal classifier tiw5 (as in yad1 tiw5 low4 'a road'). Examples of the adverbial of time as location or duration are: 'koey3 yad1 low4 siong1sam1' 'he-one-low4-broken-hearted' (he was broken-hearted during his whole journey), 'wo5siong2 seng5 low4 nim5 ging1' 'monk-all-low4-recite-prayer' (the monk recited his prayers all the way), 'seng5 low4 gin3dow2 cag2' 'whole-low4-managed to meet-thieves' (he met thieves all the way). In this last example, seng5 low4 is very similar to the adverbial of time as process or duration dealt with in 2.5.1., seng5 yad4, which can mean literally 'all day, the whole day' or 'very often'. In the example here, seng5 low4 could mean that the person in question met thieves all along the way, or very often, at many points during his journey. However, in the case of the monk reciting his prayers, it is likely that seng5 low4 really does mean 'incessantly during the whole of the journey', since praying during a whole journey is the kind of thing monks can be expected to do. yad1 low4 also occurs with durational time reference in the set phrase 'yad1 low4 soen4 fung1' 'one-low4-smooth-wind' (fair weather all the way; bon voyage), which is used in taking leave of somebody going on a sea-voyage. At the same time, it can also be used in an actual description of a good voyage, as in 'koey3 yad1 low4 soen5 fung1' 'he [had] a calm voyage all the way'.

2.8. Adverbial of instrument or concomitant cause: yad1 + agent or instrumental noun

Semantically and syntactically similar to the adverbial of frequency described in 2.1.1. is the adverbial of instrument or concomitant cause (see Killingley 1980a:1.5. and fn.3). This adverbial involves the combination of yad1 'one' with a slightly larger class of nouns than that involved in the formation of the adverbial of frequency in 2.1.1. These are also nouns denoting the agents or instruments of action, sometimes referring to parts of the human or other animate body. The nouns involved in this kind of adverbial includes the class of agent or instrumental nouns mentioned in 2.1.1. However, not all the nouns involved in this kind of adverbial may be used in the formation of an adverbial of frequency. Examples of the adverbial of instrument or concomitant cause are: yad1 seng1 haag3jaw2 cag2' 'one-voice-frighten away-thief' ([he] frightened the thief away with a shout), 'yad1 dow1 jaw4 bey2 wong3day3 saad3jo2 laa' 'one-knife-immediately-by king-executed-sentence particle' (at a single stroke of the knife, [he] was executed by the king). Sometimes, the adverbial phrase yad1 + noun may be followed by liong3 'two' + the repeated noun to form an instrumental disjunctive phrase to express 'with one or two blows, strokes, etc.', as in the case of the adverbial of limited quantity described in 2.4.2. However, unlike that adverbial, in the adverbial of instrument or concomitant cause, the two numerals yad1 and liong3 do not have the alternative of occurring adjacent

to each other. An example of this rarer type of adverbial of instrument or concomitant cause is 'yad1 saw2 liong3 saw2 jab1maay5 baawfug4' 'one-hand-two-hand-pack completely-luggage' (with a little effort [and in a short time, I] completed packing).

3. Conclusion

This essay has raised several problems arising from the existence of spatiotemporal words which show the properties of nouns and classifiers. These problems, together with those of the unclassified noun and the different kinds of adverbials expressing different aspects of time in relation to the mode, quantification and location of actions and events, are by no means solved here. However, they do reveal the complicated nature of the relationships linking members of fuzzy sets and fully established classifiers, giving us glimpses of possible movements from nouns to classifiers in the past, and providing us with some evidence to suppose that such movements could well spread to other word classes, particularly the verb. Furthermore, it might also be considered that members of the established classifier class could move out of that class into other word classes, depending on how strongly they might be motivated by factors such as homophony and homography with members of other word classes in similar or parallel adverbial formation. All these movements may be affecting not only the grammatical status of whole words, but of parts of words, such as the aspectual affix in the verb (see fn.4).

FOOTNOTES

1. In my romanization, there are five tones, as follows: tone1 high level tone; tone 2 mid-rising tone; tone 3 mid-level tone; tone 4 low level tone; tone 5 very low level tone. Square brackets are used to reduce all the different systems of Cantonese romanizations used by various authors to the more economical system used here. A Cantonese example quoted from another author is followed by a form in square brackets in my romanization.

2. But the spatiotemporal classifiers especially associated with verbs, with the exception of ci3, may not occur in this way. They only occur in a Q-Cl structure.

3. Adjectives in Cantonese are easily defined as words which may receive the comparative suffix -go3.

4. I distinguish this haa3 from the semantically related verbal aspectual affix -haa3, which denotes limited or momentary action. However, its treatment varies from author to author. For example, Meyer and Wempe (1947:101)

label hǎ [haa3] only as a classifier, Lau (1977:312) labels ha^{2} [haa3] only as an aspect marker, Kwok (1971: 114-115) treats hǎa [haa3] and yaat hǎa [yad1 haa3] as stylistic variants of her 'momentaneous aspect', while Hashimoto (see 2.3.) treats them as variants of her 'verbal classifier'.

5. An exception is ci3, which can occur in the construction Q-Cl-N, as in 'gey2 ci3 beng4' 'a few periods of illness' (see 1.1.). We can either consider ci3 as belonging to both the main class of spatiotemporal classifiers and the special subclass especially associated with verbs, or we may consider the two instances of ci3 as two separate lexemes, the result of the splitting up of one lexeme into two.

6. See Kwok (1971:pp.117-9) for a discussion of sāai [-saay3] and māai [-maay4] as part of verbal aspect.

7. jan4 is also an exception (see 2.3.).

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SPACES BETWEEN SILENCES: VERBAL INTERACTION IN QUAKER MEETINGS[1]

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In this paper I address myself to four questions: first, the membership question, how do members indicate membership and how is this recognised; second, the sequencing question, to what extent do individual spoken contributions to a Meeting for Worship belong to the 'same' Meeting for Worship and what linear connection do they show; third, the silence question, what is the relation between the spoken and the silent parts of the Meeting for Worship; and fourth, the question of the addresser-addressee, who in a Meeting for Worship is speaking to whom - and here I do not imply any ontological stance but only the issue of which audience members at Meetings of Worship have in mind, whether they consider there is any displacement at all which brings God in.

I also take up the opposing views put forward by Walker (1952) in an unpublished Ph.D. thesis, University of Edinburgh, on 'The Conception of a Ministry in the Quaker Movement and a Survey of its Development' and Bauman (1974). Walker's view essentially is that the authentic Quaker tradition is for a ministry (i.e. a separated group of ministers). He ends his study thus: 'There has been a conception of the ministry present in Quakerism from the very beginning' (p. 271). Bauman, on the other hand, in a much more sympathetic and subtle study, argues that there has always been a tension in Quakerism between silence (the 'norm' of the worship) and speech (or 'ministry'), that the tension between the natural and the spiritual faculties - between speaking and silence - was a necessary component of the Quaker experience. 'For the Quaker minister...the tension took on an added dimension because the role demanded that the minister depart from absolute silence by speaking in the very conduct of a fundamentally religious exercise' (pp. 159-60). In other words, that the ministry (clergy) was not a necessary part of Quakerism. I hope to show that it was and in a different way still is, that the tension Bauman speaks of is a natural one and is still alive today.

In order to clarify the place of speaking and not speaking in the Quaker tradition I will provide a brief history of Quakerism and a longer discussion of the nature of worship within that history. I then provide illustrative data from five Meetings for Worship, give partial answers to the four questions I began with and conclude by attempting to reconcile the Walker-Bauman positions.

Quakerism grew out of several traditions, one the general Protestant reformation and Puritan revival in western Europe, another the semi-mystical beginning in Germany and the Low Countries in the fourteenth century among the 'Friends of God' who experimented with united silent worship and were influenced by Meister Eckhart. Later, in the fifteenth century, the movements (though hardly institutionalised) of the Familists (Family of Love) and the Seekers developed, the former in the Isle of Ely, the latter in various parts of England. William Penn described them: 'They sometimes met together, not formally to pray or preach, at appointed times and places, in their own wills, as in times past they were accustomed to do, but waited together in silence and as anything rose in any one of their minds that they thought favoured a divine spring, so they sometimes spoke' (Penn 1694). The leaders of the early Quakers, the first Publishers of Truth, as they were later called, were convinced of their own direct revelation, they had experience of mystical revelation themselves and they sought ways of tapping this resource and making it known to others. The best known is George Fox, the founder (or perhaps a founder) of Quakerism, certainly the one who made the organisation of the Society of Friends of Truth (Society of Friends or Quakers) possible and still today very much his creation. Here is a typical description of his experience: 'When all my hopes in men were gone so that I had nothing outwardly to help me, nor could tell what to do, then, O then, I heard a voice which said, "There is one, even Christ Jesus that can speak to thy condition", and when I heard it my heart did leap for joy. I knew experimentally that Jesus Christ enlightens, gives grace and faith and power. I now knew God by revelation, as He who hath the key did open' (Fox 1694). The key word here is <u>experimentally</u> or as we might say experientially, i.e. in the light of one's own experience. Quakerism grew up as an assertion of the centrality of individual experience in the religious life and as continuing evidence of the validity of that experience. It works, was what the Seekers and later the Quakers were saying and what they still say. We may feel that in their emphasis on experience and on the common interpretation of that experience by one another, Quakers were a kind of primitive ethnomethodologists, recognising and interpreting the rules of experience in the process of that experience. Of course, their emphasis on individual experience had its own built-in heresy in that there seemed no way to prove the value or priority of any one's experience, a heresy that the greatest of the Quaker preachers, James Nayler, fell victim to in 1655 in his triumphal entry into Bristol certain of his reincarnation as a second Christ. Nayler was disowned and Fox provided through his hierarchical organisation of the meetings of the Society, that individual experience would always in the future be subject to group doubt and group judgement. Again, the intuition of individual members is only meaningful if it relates to a knowledge shared by other members, a good ethnomethodological precept. In rejecting all outward forms and ceremonies early Quakers ran

the risk (not always avoided, as with Nayler) of extreme nativism or naturalism. Quakerism was not anarchism and it required the sadness and the shock of Nayler's disgrace to make it come to terms with the necessary measures taken.

The full title of Quakerism is the Religious Society of Friends. As with other religious bodies worship is at its heart and the vehicle for worship the religious church service known as the Meeting for Worship. In 1979 there are several traditions of Quakerism across the world in the autonomous Yearly Meetings, in some cases as in the U.S.A. a pastoral ministry replacing the British tradition of the priesthood of all believers; but even the pastoral tradition retains something of the unprogrammed nature of the fully silent meetings, with short periods given over to silence. It is, of course, the silent meeting that is firmly associated with Quakers. Charles Lamb wrote 'although frequently the meeting is broken up without a word having been spoken, ...the mind has been fed. You go away with a sermon not made with hands...you have bathed in silence' (Lamb 1800). But it is not clear that the silent meeting was a deliberate policy: indeed it has been suggested that Quakers stumbled upon it by accident (in that they were <u>waiting</u> on God) and that it is this accident that has really been the only Quaker contribution to worship, i.e. that silence is creative in worship; all else including the belief of that of God in everyone is either normal Christianity or radical puritanism. Certainly silence was at first deeply disturbing and could be used as the engine of revivalism (as no doubt it is when used by charismatic movements today).

One account describes the visit of Thomas Parrish to Leominster in 1655. 'And after some time he spoke "Keep to the Lord's watch". These words being spoke in the power of God had its operation upon all or most of the Meeting so that they felt some great dread or fear upon their spirits... So after a little time he spoke again saying "What I say unto you, I say unto all, Watch", then was silent again' (FPT 1907). And so on. One of the most powerful accounts is that of Richard Davies, a Welsh hatter, who went first to a Quaker meeting in Shrewsbury in 1657. The meeting though 'silent from words' was, said Davies, 'as a hammer and a fire, it was sharper than any two-edged sword, it pierced through our inward parts, it melted and brought us into tears that there was scarcely a dry eye among us, the Lord's blessed power over-shadowed our meeting and I could have said that God alone was master of that assembly' (Davies 1752).

Formalism and spontaneity, tradition and experience vie with one another in religion. Both are necessary but the very nature of custom and the social process is to conventionalise. Quaker Meetings for Worship are not always, not often, spontaneous happenings - but let me compare the ideal and the real views of the Meeting for Worship.

The ideal is that the Meeting for Worship begins as soon as one member is present in the Meeting House, preferably a hollow square arrangement. As other members join in the Meeting for Worship gradually centres down, becomes a 'gathered' meeting, and out of the deep silence will eventually come in spoken contributions, examples of ministry which will be 'in the life' i.e. relevant to that occasion, that meeting, and will speak to the condition of all present. The ministry may be prayer or invocation but will always arise out of the first hand experience of the speakers. Thus the Meeting worships because it has opened itself to God, the speakers are transmitters of God's voice. In this view the Meeting for Worship is an end in itself, a poetic mystic experience that does not lead back into everyday life.

The real view of the Meeting for Worship is that the silence is not always quiet, that the meeting is not always gathered, i.e. become a unity, that for at least part of the meeting there may be small children present who are not primarily interested in silence, that members may not distinguish deep thought from light sleep, that the spoken ministry can be irrelevant to many, sometimes trivial, often repetitive because of the tendency of the same members to minister, and occasionally quite inappropriate, so often beginning in music hall fashion - 'As I was on my way to Meeting this morning', or offensive - (as when one member will address another directly and on a series of occasions in my own meeting accuse him of adultery with the speaker's wife). And when it is acceptable it is often repetitive or narrow. So often the same key words and references are used, triggering off stock responses and indicating the ritual foundation underlying all religious observance. And yet all this may be 'in the life', though what is said may not speak to my condition it may meet someone else's, and though the freedom to minister will sometimes lead to abuse, it is a freedom that is of too great value to limit and rarely if ever leads into anarchy - it is the freedom of the public meeting at which all may speak - and here we must distinguish the two senses of member, the member of that Meeting for Worship, i.e. all present, and the member of the Society of Friends, i.e. those who have actually applied for membership, been accepted and are listed as members. At all Meetings for Worship it is members in the first sense, i.e. the more inclusive sense, who may speak.

And in spite of the noise of reality, the realistic view of the Meeting for Worship says that the end of the Meeting for Worship is always served: its purpose is to reflect life and to relate back to life, 'to make you', as William Penn said 'fit for His service'. The Meeting for Worship is not an end in itself, but a recharge so that all life can be lived as worship. It brings members together in a context where all (note the shaky member distinction here) can agree that the conditions are present for a holy dialogue. And because of the insistence of that of God in everyone there is

nothing special about who or where or indeed God - the only thing special is the readiness for dialogue in a setting of silence. From being an accident the silence has become a discipline that makes worship possible - in Barclay's words 'though there be not a word spoken yet is the true spiritual worship performed, and our souls have been greatly edified and refreshed, and our hearts wonderfully overcome with the secret sense of God's power and Spirit which without words have been ministered from one vessel to another' (Barclay 1676 p.XI.6).

My quotations have all been from the 17th century. Here are two modern ones, if only to show that the tradition continues unchanged. The first is Hubbard (1974) 'Now there is no programme at all for a Quaker Meeting and so there is no guarantee that anything at all will happen. What usually happens is that the silence remains unbroken for some 15 or 20 minutes. Then someone - anyone, for this is unarranged and unpremeditated - stands and speaks for a few minutes and then sits down. The silence continues. After another 10 minutes or so another person may stand and speak and so on. An hour's Meeting without any ministry is unusual, but not unknown; an hour's Meeting in which more than about six people offer ministry for a total time of more than 15 minutes is also unusual but not unknown' (p.189).

The second by Gorman (1973) who makes some suggestions about the 'normal'pattern of a Meeting for Worship and then goes on about the 'problem of writing about the content and timing of spoken contributions in a Meeting for Worship. It is so easy to fall into the trap of appearing to suggest that there is a proper sequence which every Meeting should follow. Because of the essential spontaneity of Quaker worship there can be no such sequence' (p.106).

The Religious Society of Friends has always had a lot to say about ministry. Up till 1924 London Yearly Meeting recognised 'public Friends' or 'Recorded Ministers' i.e. Quakers who were recognised as having a facility for speaking in the ministry but after that date the practice was discontinued, underlining the recognition by modern Quakerism of the importance of spoken contributions and the importance of encouraging as many members as possible to contribute. The 'Advices', a set of recommendations to members, say 'Remember that to everyone is given a share of responsibility for the Meeting for Worship whether the service be in silence or through the spoken word. Do not assume that vocal ministry is never to be your part. If the call to speak comes, do not let the sense of your own unworthiness, or the fear of being unable to find the right words, prevent you from being obedient to the teaching of the Spirit... Pray that your ministry may rise from the place of deep experience, and that you may be restrained from unnecessary and superficial words. Faithfulness and sincerity in speaking, even very briefly, may open the way to fuller ministry from others.

Try to speak audibly and distinctly, with sensitivity to the needs of your fellow worshippers. Wait to be sure of the right moment for giving the message. Beware of making additions towards the end of a Meeting when it was well left before... Receive the ministry of others in a tender and understanding spirit and avoid hurtful criticism... remembering that ministry which to one may seem to have little value, to another may be a direct word from God' (Advices 1964).

L. V. Hodgkin (1919) points to the greater danger of over-speaking, greater than over-silence - 'each Friend who feels called upon to rise and deliver a lengthy discourse might question himself - or herself - most searchingly, as to whether the message could not be more lastingly given in the fewest possible words or even through his or her personality alone, in entire and trustful silence' (p. 77-8).

Of course, as Hubbard wryly suggests, there is lots of material waiting to be incorporated in that to-be-written 'Objections to Quaker Belief', objections from the orthodox that a priest/minister is needed to distinguish God's voice and the devil's, from the man in the street that it is all imagination anyway, and from the psychologist that it is all the subconscious. But these objectives are irrelevant, irrelevant to Quakers who have always avoided talking <u>about</u> belief, avoided theology and talk about religion (notions to Quakers are what theory may be to ethnomethodologists) because belief is second hand, secondary to experience. Irrelevant too to us because we are not in this discussion concerned with whether Quakerism is true or right, only or partially, but only with what its members do; real or fiction the discourse of the Meeting for Worship is something we can observe.

Hubbard (op.cit.) continues about his own handling of the silence 'To seek for the true silence, in which God may be heard, is an intensely personal but not a lonely quest. One is not conscious in the usual sense of other people in Meeting. Their breathing, the odd cough, the rustling in a handbag for a handkerchief, the turning of the pages of a book; these are not noises which disturb. Somehow, as the Meeting centres down, the silence becomes more palpable, so that noises make little impact on it. It is stronger than they are. ...Most of us are agreed that the spoken contribution comes best from resistance overcome; one tries to stay silent but fails' (p. 196). He continues that there is nothing wrong about bringing a text to read as long as one waits for the right moment to read it, a moment which, of course, may not come. 'Sitting quietly, working inwardly to find the centre, the stillness, listening for the voice of God, which may bring a concept into your consciousness either as a thought, a word or a visual symbol, one does not want to speak. Then the idea comes and grows. One has to say something, it must be said. One stands and starts talking. The words seem to arrange themselves; not me, but God in me for a brief while. Then suddenly the idea is

espressed, the words stop, one becomes conscious of oneself again and sits down' (pp.196-7).

Hubbard considers that there is a 'logical and associative' link in the sequence of contributions to ministry, and Gorman agrees 'as a general rule...it is usually helpful if later ministry can build on and develop what has come earlier...if the spoken contributions tend to drift aimlessly over a variety of unconnected topics, then the meeting has not been truly gathered even if each may have been good in itself' (p. 12).

Hubbard has strong feelings against the activity we are presently engaged in: 'it would be wrong to set down a record from an actual Meeting...Ministry is of God, it exists in its proper context, of words before and after and of ready hearers, and should not be transplanted out of that context' (pp. 199-200). I have given prominence to Hubbard because he sees Quakerism as a learner, having become convinced (a 'convinced' Friend is one who joins the Society as an adult) in middle age; he is thus able to objectify his experience and the Society of Friends itself in a satisfying contemporary and accessible way. Two further points from his account are of help here. First he mentions that phenomenon of ministry in which one person's perplexity is answered by another's ministry. Certainly this phenomenon is well attested. The second is the lack of distinction between speech and non-speech. 'It is the essence of the Meeting for Worship that the distinction between spoken ministry and silence is not significant, that the two elements are understood as variations on the same theme, so that we can even speak of silent ministry' (pp. 200-1).

Gorman (op.cit) disputes the significance of physical characteristics such as trepidation, pounding of the heart as being the necessary sign for when to break silence. They can, he argues, be all too often self induced. 'The first Quakers', he points out, 'did not see in this a call to speak, but rather the response to the awesome presence of God' (p. 117). No doubt in all but the most gathered of Meetings there will be some doubt as to when to speak (and certainly disagreement on how long to do so) but in spite of Bauman's argument for a primary tension between speaking and silence I prefer Hubbard's view that there is no distinction between the two. Bauman (1974) is writing of the Quaker minister, a role that no longer exists in British Quakerism. I accept that where there is a professional minister there will be conflict between his job (i.e. to minister) and his purpose (i.e. to deepen the silence). Certainly, as Bauman shows, the early ministers felt that tension (certainly, too, some present-day elders find a similar if less acute tension). But the tension was, of course, (and is) always resolvable, in that the best ministry does lead to more profound silence. Barclay (1676) cuts the knot of tension...'our worship consisteth not in words, so

neither in silence, as silence; but in a holy dependence of the mind upon God; from which dependence silence necessarily follows in the first place, until words can be brought forth, which are from God's Spirit...and there are few meetings that are altogether silent'.

Let me now draw together some of the points about the Meeting for Worship. It is silent, or has a basis of silence. Out of that silence, often after a time for centring down, for becoming gathered, spoken ministry comes, sometimes appropriate and sometimes not (though rarely to no-one), the items of ministry being usually linked one to another, each one taking the dialogue on. With some exceptions the ministry is not prolix and very rarely offensive (again we must be careful with evaluation of this kind since it is possible for what is grossly offensive to be incorporated into the meeting and to be used in the dialogue. Of course, it would be impossible if <u>all</u> ministry was offensive; the occasional non-mentionable can be incorporated but probably no more). As we have seen, a good deal is made in the literature of the uncertainty about signs for recognising the call to the ministry, but common sense suggests that we are no more certain of when to speak in dyadic interaction. Or are we? Perhaps here we have the first major distinction between normal conversation and the Meeting for Worship: in the former it may be normal to speak without giving up the turn or if the turn is given up for another addresser to take it up with minimum pause, i.e. the norm is speech; in the Meeting of Worship, on the other hand, the norm is silence. When dyadic interaction lapses into silence for more than X seconds we have what Schegloff & Sacks (1973) call an 'adjournment'. They say 'What we are really dealing with is the problem of closing a conversation that ends a state of talk. It does not hold for members of a household in their living room, employees who share an office, passengers together in an automobile etc., that is persons who could be said to be in 'a continuing state of incipient talk'. In such circumstances there can be lapses of the operation of what we earlier called the basic features; for example, there can be silence after a speaker's utterance which is neither an attributable silence nor a termination, which is seen as neither the suspension nor the violation of the basic features. These are adjournments and seem to be done in a manner different from closings. Persons in such a continuing state of incipient talk need not close segments with closing sections and terminal exchanges' (p. 262). It is clear, I suggest, that the purpose of gathering for these three exemplar occasions, family in living room, office colleagues, passengers in an automobile, is not primarily to engage in a 'state of talk'. Whether we will accept that the worship or dialogue of the Meeting for Worship constitutes a gathering for engaging in a 'state of talk' remains to be seen.

We are now in a position to argue that the Meeting for Worship has a limited set of degrees of freedom. It is <u>not</u> open ended (it has a fixed termination), it does <u>not</u> encourage frequent speaking in concert or questions requiring answers - or answers to rhetorical

questions in earlier ministry, or many forms of speaking that are entirely normal in other situations. Thus among the non-mentionables are vocative invocation in order e.g. to insult or to make arrangements or propose marriage, and reference to some informational data which do not have overt general significance (thus: 'Civil War began today in Kampala' would even without some relation to life in general or the group in particular be acceptable while 'Cod was cheaper this morning' would probably be as unmentionable as 'This is no longer a one-way street' or 'I've got a puncture in my front tyre'. Or, of course, dyadic asides, e.g. 'What's on TV tonight?'). Of course, these examples are not unmentionable - they are just not among the mentionables - they don't get said. If they did then our normal semantic sponge or one of Grice's maxims of conversation (Grice, 1975) would at once assign meaning to them and accept them as relevant or not to our own condition at that time. Again among the constraints are that the same person does not speak more than once nor does he speak for the whole of the Meeting for Worship.

Among the descriptive categories useful for analysis of our data, we have listed so far mentionables and members. Other items are topic and placement. Let us take each of these in turn:

1. mentionables: what it is legitimate for members to talk about to one another assuming a shared background and an agreement as to present context. 'We may refer', say Schegloff & Sacks, 'to what gets talked about in a conversation as 'mentionables' (p. 242).

2. members: as Turner (1970) tells us 'the sociologist inevitably trades on his members' knowledge in recognising the activities that participants to interaction are engaged in' (p. 204) - for sociologist read observer, analyst. The important point is that members know.

3. topic: given what gets talked about, i.e. mentionables, their sequencing is relevant, and in particular the position of 'first topic' in a single conversation '...making a topic first topic may accord it a special importance on the part of its initiator'. (Schegloff & Sacks, 1973, p. 243 in Turner (ed.) 1974)

4. placement: crucial for certain sequences, e.g. adjacency pairs of utterances, also used to prevent proper closing and to position topics.

Myers (1979) defines conversation in this way:'conversation is verbal and non-verbal interactivity realised by reciprocal behaviour between at least two people who alternate in the roles of addresser and addressee. Talking to oneself would count as conversation if we allow that addresser and addressee are roles that may be played by an externalised self or an

internalised other' (p. 2). Turner (1970, p. 209 in Turner (ed.) 1974) refers to the distribution of speaker's rights in the orderly conduct of conversation, i.e. the notion of utterance sequences, e.g. adjacency pairs. 'Conversations' says Turner (p. 210) can be seen as having sequential properties...thus persons employ opening slots in conversations to bring one another up to date...it is a commonplace experience to look forward to or avoid persons with whom such conversations are to be expected'. Schegloff & Sacks (1973, p. 235 in Turner (ed.) 1974) insist that '...organizing utterances and the speaker turns in which they occur are coterminous with and indeed may be taken as defining conversational activity (though not all talk, not, for example, formal lecturing)'. They emphasise that the two basic features of conversation are 'at least and no more than one party speaks at a time in a single conversation, and speaker change recurs' (p. 236) ...'it is within any current utterance that possible next speaker selection is accomplished, ..we shall speak of this as the transition relevance of possible utterance completion'. Add to this the unifunctional nature of many of the performatives used in ministry such that many may be treated as reports or descriptions, then it becomes unclear to what extent the Meeting for Worship is a conversation. We cannot speak of alternate addresser/addressee, nor of distribution of speaker's rights - unless each item of ministry is treated as a single utterance in terms of challenge and response. That is quite unacceptable on Quaker grounds - a Meeting for Worship is <u>not</u> a debate; sequential properties, yes, ministry does, it is claimed, follow some sequence (and it would be odd if it didn't). But ministry does not seem to allow for turn taking in the formal sense of built-in transition probabilities. What remain are sequence and topic and of course <u>setting</u>.

As well as their pacifism and their silent meetings, Quakers were long associated with distinctive dress and language, in particular the <u>thee</u>/<u>thou</u> usage. This has (almost) disappeared along with the dress, but, as with other groups, some favourite words and phrases remain e.g. no names for days of week and months (1st day 2nd month), no titles (FLN address form), 'see the way clear', 'stop in the mind', 'concern', 'centre down', 'be gathered', 'speaking to my condition', 'a weighty Friend', 'a convinced Friend', 'the sense of the meeting', 'to elder', 'the discipline', 'liberation for service'.

The repetitive ministry is as well known among Quakers as among other sects. This awareness of others' repetitiveness is sometimes matched by self-awareness, as a member made clear to me when he said that he very rarely ministered in Meeting because he knew he always said the same thing. But even this can be regarded as religiously acceptable if each minister is, in fact, rehearsing one or other aspect or voice of God. Even one thing to say is something.

It is not regarded as good form to evaluate the ministry given at a Meeting for Worship. Of course, Quakers do talk about it - it provides a focus for discussing the meeting (like the sermon), so much so that a totally silent meeting leaves nothing to be said afterwards. That may be more 'in the life' in the sense that religion is not - in the classical Quaker view - to be talked about but to be experienced and lived.

I want to look briefly at some of the data

Some 'facts' about my data:

1. I recorded five Meetings for Worship, all in the same place, on five Sundays during the Autumn of 1979. Each Meeting lasted one hour, the typical length.

2. The total number of speakers in all five Meetings was twenty-seven, a mean average of 5.4 per Meeting: the highest number in any one Meeting was seven, the lowest four.

3. The total amount of talk out of 300 minutes (5 x 60) was 74.6 minutes, an average of 45 minutes silence per Meeting.

4. The average length of each spoken contribution was 2.6 minutes, the longest being 8 minutes and the shortest 0.2 minutes or 12 seconds.

5. Of the twenty-seven spoken contributions, eighteen were by men, nine by women, a mean average per Meeting of 3.6 men and 1.8 women. Given the tradition in Quakerism of sex equality, the heavily female biased membership and attendance at Quaker Meetings for Worship (no doubt like other Christian denominations) it is salutary to note that men dominate the public stage in Quakerism as elsewhere.

Spaces between Silences

1	2	3	4	5
0	0	0		0
28 A(6)	30 A(1)	6 A(1)	10 A(5)	11 A(2)
A 34	A 31	A 7	A 15	A 13
39 B(3)	36 B(8)	12 B(5)	33 B(0.2)	18.5 B(1)
B 42	B 44	B 17	B 33.2	B 19.5
47 C(3)	52 C(0.5)	32 C(2)	40 C(3)	22 C(2.5)
C 50	C 52.5	C 34	C 43	C 24.5
53 D(6)	58 D(2)	50 D(2)	48 D(3)	33 D(4)
D 59	D 60	D 52	D 51	D 37
60		55 E(2)	52.5E(1)	42.5 E(3.25)
		E 57	E 53.5	E 45.75
		59 F(0.2)	54.5F(0.75)	48.25F(5.5)
		F 59.2	F 55.25	F 53.75
		60	60	56.25G(2)
				G 58.25
				60

Table I - Contributions to five Meetings for Worship

Note on Table I

> Each Meeting is represented by a separate column of letters and numbers. The letters refer to individual speakers, who are not the same at each Meeting occasion. The numbers refer to time in minutes.

Table 1 gives times for all the five meetings I recorded, thus Meeting 1 begins at 0 minutes and then at 28 minutes into the meeting speaker A begins and speaks for 6 minutes which takes us to 35 minutes into the meeting; there follow 5 minutes silence and then speaker B speaks for 3 minutes. And so on. The Appendix presents data from each of the speakers on three meeting occasions. The numbers down the left hand side in the Appendix are my line numbers.

There are obvious points to make:

1. the language is religious (Crystal & Davy 1969) - 'the interesting thing about the semantic structure of theological language is the way in which there is a clear linguistic centre to which all lexical items can ultimately be referred, namely the term 'God' (p. 165). Admittedly they are writing of written religious texts but they claim (p. 171) 'religious English is formally very different from all other varieties of the language. It is probably the most clearly marked variety of all'. They point to the use of unspecific words - words in the extracts (Appendix) like:

line	unspecifics
7	a light
8	God love
10	message of Christianity
11	compassion
12	compassion God's compassion
13	the other His love fill with love
14	higher things
16	the shaft of light
17	our idea of Christianity
19	spirit of the living God, presence, heart, the living God
22	religious experience, giving
23	reality of the spirit, love, kindness reality of the spirit
24	religious experience
25	great price, carry...pearl
26	glimpse of the whole
27	always, comfort, faith, hope
28	experience, being, kindness, loving, giving
30	meditating

32	bless
35	forgiveness
36	faith, full, abundant living
37	meditation
38	meditate, God, innocence, saints
40	forgiveness
41	absolve, trust
43	meditation, beyond expression
44	transcendental meditation, light of reality, further
45	share, greater light, God
47	life, forgiveness, our first day

2. There is obvious cohesion (e.g. lexical repetition and synonymy and pronominal repetition): cohesion here, of course, across items not within

Such cohesion is apparent in the following examples: the numbers refer to lines in the Excerpts from Three Meetings (see Appendix), and the letters to individual speakers.

3 bombing (A)	15 bombs (D)		
10 failure (B)	16 failing (D)		
11 compassion (B)	12 compassion (C)		
8 God (A)	12 God (C)		
8 love (A)	13 love (C)		
23 love (B)	28 loving (D)		
23 kindness(B)	28 kindness (D)		
4 we (A)	9 our (B)	12 we (C)	17 we (D)
7 violent expression(A)	14 cruelty (D)		
22 experience (B)	24 experience (C)	28 experience(D)	
29 shuffle (A)	46 shuffling (G)		
30 meditating (A)	38 meditate (D)	43 meditation(F)	44meditati (F
30 levitate (A)	39 levitate (D)	43 levitation(F)	
32 child (B)	35 child (C)	38 children (D)	
43 children (F)	47 children (G)		
35 forgiveness (C)	40 forgiveness (E)	47 forgiveness (G)	

In some cases there is whole unit (phrase) repetition:

11 a great deal of compassion (B)	12 a great deal of compassion (C)
4 all be wiped out (A)	15 destroy each other (D)
22 religious experience (B)	24 religious experience (C)

(and in Meeting 4 (not in extracts) 'the still small voice' repeated twice) and notice the reverse repeat:

	32 suffer...children (B)
	39 children suffering (D)
and whole section repetition:	11 we need a great deal of compassion (B)
	12 and we need a great deal of compassion (C)

There is insistence on locality, group belongingness:

in this room (1) the meetinghouse (5) our meetings (6) our view (9) your presence (19) our Quaker meeting (22) we sit down (29) our Meeting for Worship (46)

and time:

40 years ago (1) now (19) a week ago (21) this morning (39) the last week or two (40)

3. There is topic placement and in particular seizure of first topic as a lead into subsequent contributions. A in Meeting 1 leads with a reference to the Second War and, no doubt, given the date of that Meeting, to the Mountbatten killings (war, bombing, violence). This is taken up by B (problems, compassion), and D (cruelty, destroy, bombs).
In Meeting 2 A prays for God's presence, B refers to finding that a week ago (the reality of religious experience), C to the personal experience of God (individual thing) and D takes on the idea of experience.
In Meeting 5 A deliberately talks to the children, (who attend the Meeting for the first 15 minutes) and says that the aim in Meeting is to meditate not levitate. Although he does not mention the word children, his obvious reference is taken up by B and C and (along with meditation) D. Then E takes on the notion of forgiveness introduced by C and F and G relate meditation and children and then children and forgiveness.

4. There is constant bridging of the self and God; thus 21 of the 27 contributions use 1st person singular and at least 2 of the others 1st person plural. Further a number of the extracts relate a personal experience to a belief in God.
There are 23 mentions of God, Jesus, Christianity or light or His, while 6 others use words in a related semantic field, faith, loving, comfort, conscience, proper way etc.

In what sense can the Meeting for Worship be considered a single conversation? The answer is probably that it cannot (no closures, no adjacency pairs, no turn taking sequences, not inexplicit, not random, probably not normal non-fluency). But it is open to all, only one speaks at a time, there is a sequence leading from first topic. (Goffman and others have pointed out that speech is not necessarily central to an event, that there are other arrangements in which for example people who are on easy familiar terms with one another may be engaged together in an ongoing activity and while so engaged occasionally speak aloud). It is a repeated

event in the social process, like family meals, journeys, games, committee meetings on the one hand, and seminars with set papers on the other. Yet it is still special because not made up of single conversations unlike the 1st group (family meals etc.) and it is spontaneous, unlike the 2nd group. Further, and perhaps most important, it contains so much silence. The silence is not that described by Basso (1970) among the Western Apache 'keeping silent among the Western Apache is a response to uncertainty and unpredictability in social relations' (p. 83). It is not that.

Given that the Meeting for Worship is a social occasion the boundaries are presumably social ones e.g. time, arriving, departing, formal ending, announcements, not linguistic ones.

I want to suggest that the Meeting for Worship is both a social occasion and a speech event. Certainly that is how members see it. As in other speech events such as single conversations there are forward and back references (e.g. 'last week in Meeting') but to members a Meeting for Worship is also a social occasion in which ministry is normal and in which items of ministry interrelate. Perhaps a better analogy than a family meal is a performance (music, singing, stories) and there is therefore a strong link with oral narrative.

Now let me come back to my first four questions.

1. How do members recognise one another? - by keeping to the linguistic rules of (a) silence and (b) if ministering, some combination of 'religious' language and first person reference.

2. Are items of ministry ordered sequentially? Yes, as the analysis shows and as the saliency of first topic indicates.

3. What is the function of silence in the Meeting? My answer here is that the Meeting for Worship is normally silent, silence being the preferred means for gaining access to God (<u>the inner light</u>) - as Bauman (op.cit.) shows 'a suppression of the earthly self was required of those who were attentive to the light, and the basic term employed by the Quakers to refer to this suppression of self was silence' (p. 145). Silence is for worship - ministry is a kind of intrusion bringing to the surface what is being said if members listen in the silence.

4. Who speaks to whom in a Meeting for Worship? The answer is already given. God speaks through one member, the others hear, i.e. they may not listen. But in no sense (I think) does this imply a state of trance, nor, indeed, does it imply glossolalic phenomena. (Samarin 1972). Given the Quaker view of the unity of God and man (and world) then speaking about oneself is legitimate, indeed

> recommended (the Fox insistence on experimental religion) as long as it is done with the worship purpose in mind. How to judge that is, of course, very hard, but certainly members do judge and certainly, as I have indicated, ministry can be unacceptable.

Ministry is not ordinary informal conversation nor is it trance or glossolalia, somewhere perhaps in between. Walker's argument already quoted that Quakerism has always had a conception of the (trained) ministry is, I suggest, correct. Ministers are no longer recorded, but it does seem that there is a discourse style that is special to them still, a style which must be learned. There is no problem about that since all members are called to minister and can learn to do so. Bauman's tension view is, I suggest, also correct. There is no conflict between these two views. There is a speaking-silence tension, but this is an ambiguity central to all religious experience in which words are used to speak of the ineffable. And yet Quakers would say - as do other religious groups - we use in worship what we have, what we are.

Although all this may seem to detract from the delightful spontaneity of a Quaker meeting, the premise of open ministry remains - <u>anyone</u> may speak, all may learn. 'Remember that to everyone is given a share of responsibility for the Meeting for Worship, whether that service be in silence, or through the spoken word. Do not assume that vocal ministry is never to be your part' (Advices 1964). Like other forms of discourse it must be learned: 'my understanding became more strengthened to distinguish the language of the pure spirit...and taught me to wait in silence sometimes many weeks together until I felt that rise which prepares the creature to stand like a trumpet, through which the Lord speaks to his flock' (Woolman 1922).

APPENDIX

Excerpts from three Meetings for Worship

Meeting 1

Line

1 A. I've been in this room 40 years ago when war was declared
2 .....the sirens.....middle of the meeting.....
3 harrowing experience.....most of us thought.....bombing
4 .....start up.....we'd all be wiped out pictures
5 .....meeting house collapsing around us
6 others of our meeting.....opposition to violence
7 .....a light.....these forces.....capable of violent expression.....
8 we call God love
9 B. .....the problems.....our view of religion..... the lives of countries
10 and peoples.....the message of Christianity..... one of failure
11 we need a great deal of compassion too
12 C. and we need a great deal of compassion.....God's compassion
13 .....and fill the other person with His love.....
14 D. man is indeed capable of higher things.....cruelty .....
15 selfishness and ignorance.....destroy each other .....make.....bombs.....
16 mankind as failing.....the shaft of light..... true of Christianity.....
17 that very often we fail.....open our idea of Christianity.....includes
18 everybody

Meeting 2

19 A. spirit of the living God.....your presence..... now.....the heart of
20 each person
21 B. roughly a week ago.....I was at Dorchester Meeting .....the.....reality
22 of religious experience.....our Quaker meeting..... in giving
23 the reality of the Spirit.....love.....kindness..... the reality of the Spirit
24 C. religious experience.....such an individual thing
25 I.....think about it.....the pearl of great price .....each one
26 carries.....glimpse of the whole.....stays
27 .....always.....gives.....comfort.....faith .....hope
28 D. .....experience and being.....kindness..... loving.....giving

Meeting 5

Line

29 A. we sit down.....shuffle about.....
30 I like to think.....meditating.....levitate .....quietly.....life.....proper way
32 B. bless the child.....children.....God..... suffer the little children
33 to come to me and forbid them not for
34 of such is my Kingdom
35 C. lest ye become.....little child.....forgiveness .....trust
36 .....faith.....Jesus.....full and abundant living....
37 meditation
38 D. meditate.....children.....God.....innocence .....saints.....
39 levitate.....I heard the news this morning..... children suffering
40 E. .....the last week or two.....forgiveness..... I had to
41 do a lot of typing.....absolve.....trust..... punishment.....
42 relationship
43 F. .....meditation.....children.....beyond expression .....levitation
44 .....transcendental meditation.....light of reality .....further
45 chore.....greater light.....God in as a child
46 G. our meetings for working.....silence.....shuffling .....
47 life.....children.....forgiveness.....our first day.....
48 fit for His service

FOOTNOTE

[1]This paper was first given at the Sociolinguistics Symposium, Walsall, September 1979. A revised version was read to the Linguistics Circle, University of Edinburgh, February 1980.

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REVIEW OF M.A.K. Halliday (1978) Language as Social Semiotic: The Social Interpretation of Language and Meaning
London: Edward Arnold

Since I intend to be critical of certain aspects of this book, let me say at the outset that, as always with Halliday's writing, I find it a veritable storehouse of interesting and insightful ideas.

There are in fact far too many points worthy of attention for me to be able to discuss them all in one article. It will be necessary to be selective. I propose to concentrate my discussion on one particular chapter: Chapter 6. I have chosen Chapter 6: (a) because it is the eponymous chapter of the book; (b) because it is representative of most of the other chapters in that it includes mention of what seem to me to be the most interesting ideas discussed in the other chapters; (c) because it is representative also of Halliday's more detailed work of the period, the discussion of What is a Text? linking it with Halliday and Hasan (1976) and the discussion of child language linking it with Halliday (1975); (d) because in my view it is the clearest and most complete account of what was new in Halliday's thinking in the early and middle seventies, the emphasis on text, situation, register and code, each as a set of meanings, or sources of meaning.

I shall begin by summarising Chapter 6. I shall then indicate what I consider to be the potential importance of Chapter 6, both for linguistic theory and for educational theory, before going on to discuss problems associated with Chapter 6, problems which in my view are at present preventing Halliday's approach from being developed in such a way as to realise its full potential.

1. Summary of Chapter 6

After a series of questions which he considers need answering, Halliday lists 'certain general concepts which seem to be essential ingredients in a sociosemiotic theory of language'. These general concepts are 'the text, the situation, the variety or register, the code (in Bernstein's sense), the linguistic system (including the semantic system), and the social structure'. (p.108)

A text is an instance of 'linguistic interaction in which people actually engage: whatever is said, or written, in an operational context'. Two important points are made about a text: (i) it is a semantic unit; (ii) it represents choice. It is a set of meanings chosen from the total set of meanings that could have been chosen. It is 'actualised meaning potential'. (pp.108-9)

A register is a text variety. It is the set of meanings that 'the member of a culture typically associates with a situation

type' (p.111) (my emphasis). This definition of register is a departure from earlier accounts of register (e.g. Halliday et al 1964) where the discussion was in lexicogrammatical rather than semantic terms. The semantic options are still however realised through lexico-grammatical options (pp.110-1).

A register, then, is associated with a situation type. Halliday describes a situation type, or social context, as 'a constellation of meanings'. It can be represented as 'a complex of three dimensions': the field, which is the 'social action' of which the text is part and which includes the subject matter; the tenor, which is the 'set of role relationships among the relevant participants' and which includes levels of formality; the mode, which is 'the function that is assigned to language in the total structure of the situation' and which includes whether the medium of communication is written language or spoken language (pp.109-10).

The association between situation type and register enables a hearer to 'make sensible guesses about what the speaker is going to mean' (pp.109-10). These sensible guesses make it possible for the hearer to 'decode the highly condensed utterances of everyday speech' (p.108).

The availability of a register to a particular speaker is determined by the code, the code being 'the semiotic style, or "sociolinguistic coding orientation" in Bernstein's term, that represents the particular subcultural angle on the social system" (p.123). Thus if speaker A is a member of a different subculture from speaker B, the set of registers available to A may differ from the set of registers available to B.

The code appears to be a product of the social structure (p.125). The social structure is not defined. At first one is tempted to think that it must be the same thing as the 'social system' (pp.123-4), but this is evidently not so as the two phrases are conjoined on page 114 and appear separately in the diagram on page 69. The social system, we are told, must be interpreted as 'a social semiotic: a system of meanings that constitutes the "reality" of the culture' (p.123).

The linguistic system is represented as being composed of three strata: a semantic stratum, a lexicogrammatical stratum and a phonological stratum. The semantic stratum is the most important in a sociolinguistic context. This semantic stratum is composed of three functional components: the ideational component, the interpersonal component and the textual component, these being defined in essentially the same way as in Halliday's earlier work (pp.111-3).

What is new is that the functional components of the semantics are now related to the components of the situation type. 'There is a tendency...for the field of social action to be encoded linguistically in the form of ideational meanings, the role relationships in the form of interpersonal meanings and the symbolic mode in the form of textual meanings' (p.123).

The chapter also contains observations on the way in which a child learns language.

2. The potential importance of Chapter 6 for linguistic theory

What has always distinguished systemic linguistics from other types of linguistics, from the early neo-Firthian days right up to the present, is an interest in the interrelations between language, situation and culture. And, furthermore, a belief that such interrelations can be described systematically. Most linguists who have shown an interest in such interrelations - sociolinguists such as Labov, speech act theorists, pragmaticists, discourse analysts - have proceeded on what would seem from this point of view to be a very ad hoc basis: the situational features to which these linguists have chosen to relate linguistic features have been selected very much just on the basis of what will meet the needs of the moment in the form of the problem currently under investigation. There is no indication in the writings of these linguists that the eventual aim is a coherent and comprehensive theory of the nature of the interrelations between language, situation and culture, a theory which will enable predictions to be made about the types of situational or cultural feature that will have greatest influence on language form and about restrictions on the types of influence possible.

Halliday does aim at such a theory and indeed is outlining such a theory in Chapter 6. It could thus be claimed that he is adding a new dimension to linguistic theorising. (I am encouraged by Newmeyer (1982:95) to think that even transformational-generative linguists would welcome such complementation of their own work, in spite of the fact that Halliday's theory is not a theory about the existence or nature of grammatical competence).

Two aspects of Halliday's theory would seem to be of particular interest:

2.1 The claim that 'Given an adequate specification of the semiotic properties of the context in terms of field, tenor and mode we should be able to make sensible predictions about the semantic properties of texts associated with it' (p.110).

As I indicated in the summary, Halliday claims that certain sets of meanings (registers) are associated with certain types of situation. Given a knowledge of the relevant features of any actual situation, therefore, it should be possible to predict the meanings which will occur in any non-deviant text produced in that situation.

If it really can be established that meanings can be associated with types of situation to the extent that it is possible to predict the meanings from the situations, then, as Halliday suggests, it will be possible to explain one very important aspect of the way in which people use language. Halliday

asks the question: 'How do people decode the highly condensed utterances of everyday speech?' (p.108). His own answer to this would be along the following lines:

> Imagine that you come in, as we often do in real life, to a situation that is already going on. It doesn't matter what it is. It could be just a group of people engaged in any kind of activity. You, as an individual, come into this group from outside. Very quickly, you are able to take part in the interaction. How do you do this? You do it, I suggest, by constructing in your mind a model of the context of situation; and you do so in something like these terms. You assign to it a field, noting what is going on; you assign to it a tenor, recognizing the personal relationships involved; and you assign to it a mode, seeing what is being achieved by means of language. You make predictions about the kinds of meaning that are likely to be foregrounded in that particular situation. So you come with your mind alert, with certain aspects of your language ready foregrounded, ready to be accessed, as it were, for taking part in this interaction. Something like this, I think, must be going on. Otherwise, it would be impossible to explain how it is that in real life we do so readily join in and take part in a situation that previously we knew nothing about.
> (Halliday, 1980:42)

No matter how condensed the utterances in such a situation, it would still be possible to interpret them via intelligent guesses (predictions) based on knowledge of the field, tenor and mode, about what meanings would be most likely to be being exchanged in that situation.

Halliday's question seems to me to be worthy of being ranked alongside the question which so fascinated transformationalists in their early days: How is it that we are able to understand and produce utterances that we have never heard in our lives before? Rephrasing Halliday's question: How is it that we are able to understand and respond to utterances when the utterances themselves give only the very minimum of linguistic clues as to their meaning? Halliday does seem to have provided the <u>beginnings</u> of an answer to this question.

Of course, although we can usually decode condensed utterances, it is not true that we <u>always</u> can. Halliday's theory also provides the <u>beginnings</u> of an explanation of those occasions on which our attempts at decoding condensed utterances are unsuccessful.

One possible explanation is that the text is deviant, that it is not in the register associated with the type of situation in which it occurs. This would certainly appear to be the explanation of a recent experience of my own. Normally I expect the opening remarks between myself and a station taxi driver to be concerned with where it is I want to go. I therefore have no difficulty in decoding condensed utterances

from taxi drivers such as 'Where to?'. I do not even have any difficulty if the only communication is a lift of the eyebrow. However, the Sheffield taxi driver who addressed me with the words 'Jump in' foxed me completely and had to repeat himself four times before I grasped what he was saying. His meaning was completely contrary to my own expectations.

When fully developed, Halliday's theory should be able to distinguish the meanings which <u>are</u> normally associated with a particular type of situation from those which are not. The former could be predicted to be easily decoded in a situation of that type, the latter only with great difficulty if at all. Halliday's theory could thus account both for successful decodings and for unsuccessful attempts.

However, there is sometimes another possible explanation of difficulty in decoding. According to Halliday's theory, sets of meanings (registers) are not only associated with types of situation; they are also associated with different types of sub-culture (codes). Different sets of registers are associated with different codes. If in the story I quoted from Halliday above, the new member of the group belonged to a different sub-culture from that of the members already there and if they were using a register not associated with the new member's sub-culture, it is very unlikely that he would be able to make the necessary predictions to enable him to join in.

Once again, when Halliday's theory is fully developed it should be possible to distinguish between those registers which <u>are</u> associated with a particular sub-culture and those which are not. It will then be possible to make predictions about situations in which there is likely to be difficulty in decoding.

2.2. <u>The claim that 'the field of social action (is) encoded linguistically in the form of ideational meanings, the role relationships in the form of interpersonal meanings, and the symbolic mode in the form of textual meanings'. (p.123)</u>

Halliday is proposing: (i) that a situation type can be characterised in terms of three discrete sets of features, <u>field</u>, <u>tenor</u> and <u>mode</u>; (ii) that the semantic properties of a text can be characterised in terms of three discrete sets of features, <u>ideational</u>, <u>interpersonal</u> and <u>textual</u>; (iii) that ideational features are relateable to field, interpersonal features to tenor, and textual features to mode.

He is proposing not only that there are relationships of association between situation types and meanings such that meanings are predictable from the situations, as indicated in the previous section, but that these relationships of association are specifiable in such a way as to show that they are restricted in their nature. Effectively he is proposing <u>constraints</u> on situation-text relationships. The claim is that relationships between texts and situations are <u>not</u> patternless and limitless, but on the contrary highly ordered and reducible to just three distinct groupings.

This opens the way for a study of universals of situation-text relationships, as rigorous and interesting as the study of syntactic universals.

(For further discussion of this point, see Berry 1980 and forthcoming).

3. The relevance of Chapter 6 to educational theory

Again, under this heading, there would appear to be two points of particular interest, the first showing the relevance of Halliday's theory to a theory of language teaching, the second to educational theory more generally.

3.1. Halliday's theory is a theory about the predictions made by language users

As Stubbs has said (in press:21), 'Learning a language is essentially learning to make correct predictions'. Teaching a language would thus entail knowledge on the part of the teacher/programme designer of what are the 'correct predictions' - that is, presumably, of what predictions would be made by a native speaker - and of the bases on which the predictions would be made, in order that the learner might be guided to a position in which he too is able to make these predictions.

Halliday's theory is highly relevant to this view of language learning and teaching, since it is a theory of the predictions that are made by native speakers of a language and of the aspects of the context of situation which enable them to make these predictions.

Indeed, in one respect, Halliday goes even beyond Stubbs. Stubbs continues after the sentence which I have quoted above by saying, 'As soon as something is said, one can make predictions about what is likely or unlikely to be said next'. Halliday's claim would be that even before something is said, it is possible to make predictions about what is likely or unlikely to be said, on the basis of certain aspects of the situation.

3.2. Halliday's theory offers a new hypothesis to account for the fact that working class children do less well at school than middle class children

Working class children and middle class children are members of different sub-cultures. According to Halliday's theory, a different set of registers would thus be available to the working class children from the set that is available to the middle class children. The set of registers available to the middle class children is likely to have more in common with the set of registers available to the teacher. The middle class children would, therefore, be in a better position to make the 'correct predictions' than the working class children. It would not be surprising if the learning process for working class children were slowed, or if they found difficulty in

settling into school socially, if their expectations were continually being confounded, or indeed if they were continually being confronted with something about which they had no expectations at all.

A note of caution is necessary here, however. Great care will need to be taken over the way in which Halliday's theory is developed, if it is not to be as untestable as versions of the closely related theory of Bernstein. (See Stubbs 1976: Chapter 3, for discussion of problems associated with versions of Bernstein's theory. Also, see below).

4. Problems with Chapter 6

Potentially, then, Halliday's theory has a very great deal to contribute, to linguistic theory (provided that this term is not interpreted too narrowly - again, see Newmeyer 1982:95), to a theory of language teaching and to more general educational theory.

However, before we allow ourselves to become too excited at the prospect, let us remind ourselves that all we have is the outline of a theory. The details still need filling in. And this is something that systemic linguists seem to be very slow at doing. The concepts of field, tenor and mode have been around for nearly twenty years now. Even in its later form, with emphasis on meanings rather than on lexico**grammar**, the theory has been around for at least eight years. Yet the number of concrete predictions we are able to make with any confidence, about the occurrence of particular meanings in particular types of situation and the non-occurrence of other particular meanings in those types of situation, is distressingly few. Very few explicit hypotheses have been set up, let alone tested and corroborated. And the theory will not be much use to anyone, except in a very vague and impressionistic way, until we are able to supply the details. What is the use of knowing that in some situations there is likely to be difficulty in decoding, if we do not know in precisely which situations and for what reasons?

This is the reason for this somewhat belated review of Language as Social Semiotic. The publicisation of Halliday's theory in book form has not had the results that I had hoped for. On reflection, I think that some of the reasons for the lack of progress are directly traceable to problems in the way in which Halliday has presented his theory. It is my hope, by discussing these problems, to clear the way for more rapid and effective progress.

I shall pay Halliday the compliment of discussing the problems in his own terms, in terms that is of register. I would suggest that the main problems with Halliday's writings, as exemplified by Chapter 6, are problems of register. Halliday does not use the register which one typically associates with the writing of a linguist for linguists about linguistics.

Like Halliday I am not using the term register in a superficial sense. I do not mean that he is using the wrong lexical items or the wrong grammatical structures. I mean that his text does not include the types of meaning which one typically associates with the field, tenor and mode of the relevant situation type.

It is not just that he is saying different things from other linguists. In fact, in so far as he is saying different things, in so far as he is directing our attention to aspects of language neglected by other linguists, this seems to me to be wholly admirable. It is rather that he is not developing his arguments in the ways that linguists usually do. (Ways of developing an argument do count as meanings for Halliday, as he makes clear in connection with the register of mathematics (p.196)). I suspect that what I am doing here is applauding his ideational meanings, but criticising his interpersonal and textual meanings, (though as I shall indicate below I have difficulty in distinguishing reliably between the ideational, the interpersonal and the textual).

I shall discuss five types of meaning that I think are missing from Chapter 6 (and indeed from most of the other chapters in the book). The first three seem to be missing by accident rather than by design. The fourth and fifth types seem to be missing by design. Halliday has explicitly denied himself their use and seems to be attempting to proscribe these types of meaning, at least among those linguists who adopt his own overall approach. In my view he is thus making it very difficult for himself or others to develop his approach, to put flesh on the bones which Chapter 6 has outlined. He is in fact proscribing the very means which linguists usually use for developing and testing their theories, leaving himself with nothing effective to put in their place.

The five types of meaning that I shall be discussing are: relation of theory to relevant data (section 4.1); precise definitions of terms (section 4.2); distinction between fact and hypothesis (section 4.3); reference to the syntagmatic organisation of language (section 4.4); precise formulations of rules (section 4.5).

4.1. Relation of theory to relevant data

Usually in a written text about linguistics by a linguist for linguists, each theoretical point is accompanied by reference to data. From this point of view there could perhaps be said to be basically two sub-registers of linguistics (though with some hybrid forms). In one, the data are given first and then a theoretical point is made which would account for the data. In the other, the theoretical point is made first and then exemplified. I would suggest that in both sub-registers there is a regular association between theoretical point and relevant data, so regular an association that when the data occur first the making of a theoretical point is predicted and

when the theoretical point occurs first exemplification is predicted. When reference to relevant data is missing, an obligatory element of the text structure has been omitted.

In Chapter 6 there is very little reference to data. What there is is (a) badly positioned, (b) limited in range, (c) not strictly relevant to the theoretical points that are being made.

(a) Unsatisfactory positioning of data

There is no attempt at point by point relation of theory and data. The only discussion of data that is included is divorced from the main theoretical discussion by being placed in a separate section of the chapter. The links between this section and the previous section are not sufficiently explicit for the relationship between theoretical point and exemplification to survive the distance between them. I am not even sure whether the discussion of data in this section is intended to exemplify the theoretical points in the previous section or whether something new is being introduced with just vague reference back to earlier points.

(b) Limited range of data

The only data given are textual data. I am at one with Halliday in regarding textual data as important. In fact, texts are what I am really interested in. I would not be happy with any theory of language which did not enable me to say worthwhile things about individual texts and groups of texts. However, one has to recognise that there is a limit to the usefulness of textual data when it comes to constructing and testing a theory; the textual data need to be supplemented by other types of data. Halliday appears to recognise this. In Chapter 10 he says 'The data are...what people say in real life, not discounting what they think they might say and what they think they ought to say' (p.192). In Chapter 2, 'To my knowledge, no linguist has ever simply described a corpus; this is a fiction invented for polemic purposes' (p.40). (In both cases, my emphasis). Yet he makes very little use of other types of data in this book, none at all in Chapter 6.

Even if one accepted the restriction to textual data, the data in Chapter 6 would still be very limited. Apart from a brief mention of work by Turner (Turner 1973), Halliday discusses only one text. And a very homogeneous text at that, not one which shows internal variation.

Such limited data are totally inadequate for the support of the very large theoretical claims that Halliday is making. This brings me to my next point.

(c) Unsuitability of the data to the theory

Three types of hypothesis would appear to be derivable from the theory that Halliday is outlining. None of these can be

supported by reference to one single homogeneous text.

(i) Hypotheses about the situational or cultural factors that determine features of texts. Textual data are certainly appropriate here, as the predictions are about the meanings that will actually occur in texts, given the presence of a particular situational or cultural factor (or set of factors). However, more than one text is necessary to justify the setting up of such a hypothesis, or at least, a text which shows internal variations. One cannot support a hypothesis that factor X determines feature A without showing, not only that A occurs when X occurs, but also that A does not occur when X does not occur. Halliday's discussion of a single homogeneous text does not show what it claims to show.

(ii) Hypotheses relating to the intuitions that members of a culture have about the appropriateness of certain meanings to certain types of situation. Such a hypothesis would presumably take the form: members of the culture expect meaning (or set of meanings) B to occur whenever cultural or situational factor (or set of factors) Y is present, but not when Y is absent. The primary data here would be reactions to texts rather than the texts themselves. Reactions to more than one text would have to be considered. To support such a hypothesis one would have to show: that the judgement appropriate was given in the cases of those texts where B co-occurred with Y; but that the judgement inappropriate was given in the cases of those texts where B occurred without Y, or Y occurred without B.

(iii) Hypotheses about the situational or cultural factors that enable hearers to anticipate meanings and consequently to decode elliptical utterances. Here one would appear to need data along the lines of that provided by Labov and Fanshel (1977:e.g.50) - what Labov and Fanshel call expansion alongside what they call text. (Halliday's text presumably = Labov and Fanshel's expansion. Halliday does not appear to have a term for what Labov and Fanshel call text). Again however, carefully controlled sampling of texts would be necessary. In order to see whether a cultural or situational factor (or set of factors) Z provided the clue for a meaning (or set of meanings) C, we should in the first instance have to look at texts (in Labov and Fanshel's sense) from which C was missing. We should have to see whether C, though missing from the text, was nevertheless present in the expansion. To support a hypothesis of this kind we should have to show: that, though missing from the text, C was nevertheless present in the expansion on those occasions when Z was present; that C was missing from the expansion as well as from the text on those occasions when Z was absent. It would also be interesting to look at occasions on which C was actually present in the text. One might expect that, even when C was explicitly stated, hearers would have difficulty in interpreting it correctly in the absence of the conditioning factor Z, though they would have no such difficulty in the presence of Z.

Let me make it clear that I am not saying that there is no value in a study of a single text. Of course there is. I am saying that one cannot use a study of a single homogeneous text to support theoretical points which entail differences between texts.

Nor am I saying that Halliday should have waited to write the paper on which Chapter 6 is based (Halliday 1974) until he had carried out a detailed examination of all the types of data I have mentioned. One does not expect a new theory to spring into life fully documented. It is true that the real usefulness of a hypothesis such as those discussed above could not be properly assessed until a statistically valid sample of material had been systematically examined. However, I would regard the setting up of such a hypothesis as justified if it appeared to account for informally observed differences between just two texts, or sets of reactions to texts. The systematic testing could come later.

As it is, Halliday does not even discuss the different types of data that would be relevant to his theory. Indeed, he does not even spell out the hypotheses and types of hypothesis that would show how his very general theory could be precisely related to data. I have had to provide an 'expansion' for his 'text' at this point.

The lack of integration of discussion of data with discussion of theory means that Chapter 6 fails to show what kinds of fact its theory could account for. This means that no idea is given of why this theory is preferable to any other kind of theory. Chapter 6 would thus be unlikely to convince those linguists not already sympathetic to Halliday's views.

From the point of view of those linguists who are already sympathetic to Halliday's views, the lack of discussion of precise hypotheses and relevant data means that they are being given no clear guidance on how Halliday's theory might be developed and, even more important, no guidance on how it might be tested.

4.2. Precise definitions of terms

There is also usually in written texts about linguistics by linguists for linguists a regular association amounting to a prediction between a technical term and a precise definition of that term. (Except where it is crystal clear how the term is being used). Halliday's technical terms are not always accompanied by precise definitions. This problem comes in four forms:

(a) Some terms are not defined at all. This applies both to the terms used for the individual meanings represented in the networks on pages 118-120 of Chapter 6 and also to some of the more general terms. I could not find anywhere in the book explicit definitions of centrally important terms such as meaning and semiotic. It is obvious that Halliday is using these terms

in a different way from other linguists. How exactly is he using them? These are instances in which I would not regard ostensive definition as sufficient.

(b) Some terms are defined at one point in a chapter and then used in a different way later in the chapter with no new definition. Semantics for instance is defined on page 114 of Chapter 6. It is used again on page 123, this time obviously with a different meaning, but with no new definition.

(a) and (b) together lead to a general lack of confidence in Halliday's use of terms. One is sometimes tempted to suspect that he is using terms emotively rather than precisely. Anything that comes with a sem- or socio- stamp is OK. For instance, are sociolinguistic and sociosemiotic just vague terms of approval? Is the 'general sociolinguistic theory' of the heading of section 4 of Chapter 6 the same thing as the 'sociosemiotic theory of language' of the heading of section 2? If so, why not use the same term? If not, exactly how do they differ?

(c) Some terms are defined, but not sufficiently precisely for Halliday's own analyses to be replicable. This applies particularly to the terms field, tenor, and mode (p.110). Later in the book (p.224) Halliday draws attention to the fact that, whereas he would include rhetorical genre under mode, other writers have included it under tenor. I cannot myself see why it cannot be included under field. What is worrying here is not that there are differences of opinion, but that there seems to be no principled basis for adjudicating between the different opinions.

(I am not entirely sure that the terms are even intended to be mutually exclusive. But if they are not mutually exclusive, are they really any use either when it comes to analysing individual texts or when it comes to constructing a theory?).

Problem (c) also applies to the three functional components of the semantics: the ideational, the interpersonal and the textual. However, in this case there is an even graver problem - problem (d) - and I shall accordingly concentrate on this.

(d) Halliday says that the field, tenor and mode of the situation type tend respectively to determine the ideational, interpersonal and textual components of the semantic system (p.116). He also seems to say that the components of the semantic system in turn determine the organisation of the lexicogrammar. '...the functional organization of meaning in language is built in to the core of the linguistic system as the most general organizing principle of the lexicogrammatical stratum'(p.113). (My emphasis).

If something is going to be said to determine something else, the two things must be definable independently of each other. One cannot say that A determines B if one has just defined B

in terms of A. At least one can say it but it will not be very interesting since it will be true by definition. To take an obviously ridiculous example. I am talking about different kinds of journey - bus, train and tram - and different kinds of ticket - bus tickets, train tickets and tram tickets. I define bus tickets as those tickets that one gets on bus journeys, train tickets as those tickets that one gets on train journeys and tram tickets as those tickets that one gets on tram journeys. I then say that the type of journey I go on will determine the type of ticket I get. In other words I am predicting that if I go on a bus journey I will get a bus ticket, that if I go on a train journey I will get a train ticket and that if I go on a tram journey I will get a tram ticket. This will no doubt turn out to be true. But I can scarcely be said to have increased the sum of human knowledge.

If, then, Halliday wishes to claim that the components of the situation type determine the functional components of the semantics and that these in turn determine the organisation of the lexicogrammar, the relationships of determination being significant for his general theory, then the three sets of categories must each be defined independently of the other two sets.

Halliday is evidently aware of the need for independent definition (p.149). Yet throughout the book the definitions given of the functional components of the semantics are always either in terms of the situation (e.g. p.112) or in terms of the lexicogrammar (e.g. pp.48-49). It is never clear that there is a way of defining the functional components of the semantics that is independent of both the situation and the lexicogrammar.

4.3 Distinction between fact and hypothesis

Here I am concerned with meanings usually kept distinct in linguistic writings, which in Chapter 6 are allowed to become confused.

I have already complained of the scarcity of facts and precise hypotheses in Chapter 6. I am now complaining that the few that are included are not clearly distinguished. It is difficult to tell whether they are intended to be facts or hypotheses. I will give two examples of such confusion:

(i) These components (i.e. the ideational, the interpersonal and the textual) are reflected in the lexicogrammatical system in the form of discrete networks of options. In the clause, for example, the ideational is represented by transitivity, the interpersonal by mood and modality, and the textual by a set of systems that have been referred to collectively as 'theme'. Each of these three sets of options is characterized by strong internal but weak external constraints: for example, any choice made in transitivity has a significant effect on other choices within the mood or theme systems. (p.113).

The points made in this paragraph are stated authoritatively, as if they were facts based on systematic observation. But, as far as I know, although Halliday has made the points repeatedly, not only in this book but elsewhere, he has never subjected them to objective and systematic investigation. The discreteness of the networks is still hypothetical.

It is in fact very easy to think of counter-examples. To mention just three, briefly: the choice of type of process (transitivity) affects the availability of the imperative option (mood) - Go! but not *Happen!, Be careful! but less probably ?Seem careful!; in spite of his remarks here, Halliday has suggested elsewhere that there is interaction between transitivity and theme (e.g. Halliday 1968:205); any attempt to draw up a network for transitivity or for voice (listed on page 132 under the heading of textual) usually results in the two becoming inextricably entwined (e.g. Halliday 1968:203).

It is, of course, true that here as elsewhere Halliday is stating his views in a more/less rather than an all/nothing form. But that presumably only means that there is all the more need for him to show that there really is a statistically significant difference between the 'strong internal' and the 'weak external' constraints. Particularly since other parts of his theory rest on the assumption that the statements made here are true.

(ii) There is thus a systematic correspondence between the semiotic structure of the situation type and the functional organization of the semantic system. Each of the main areas of meaning potential tends to be determined or activated by one particular aspect of the situation: ...ideational systems activated by features of field, interpersonal systems activated by features of tenor, textual systems activated by features of mode. (p.116)

This passage occurs immediately after the discussion of the single text, in which certain fragmentary observations have been reported. There has been no attempt to set up precise hypotheses and to test these systematically in relation to a controlled sample of texts. There is nothing, in other words, to justify the firm conclusions that Halliday draws, to justify the stating of the points as if they were established facts. The relationships of determination between the 'main areas of meaning potential' and the 'aspects of situation' are still hypothetical.

(It would, of course, be difficult to set up precise hypotheses and to test them systematically until the definitions had been sharpened so that the two sets of categories were defined independently of each other and so that the categories within each set were mutually exclusive).

Not only, then, does Halliday not include enough facts and enough precise hypotheses, as I said under 4.1 above. He confuses those that he does include. He is not helping his own cause by making it sound as if greater progress has been made towards the construction and testing of his theory than is actually the case.

4.4. Attention to the syntagmatic organisation of language

This is a type of meaning which Halliday is explicitly attempting, if not to outlaw altogether, at least to relegate to a minor role. In Chapter 2, he says:

> If we go back to the Hjelmslevian (originally Saussurean) distinction of paradigmatic and syntagmatic, most of modern linguistic theory has given priority to the syntagmatic form of organization. Structure means (abstract) constituency, which is a syntagmatic concept. ...I take out the paradigmatic relations (Firth's system) and give priority to these. (p.40)

In Chapter 10, under the heading of Methodological considerations, he puts this even more strongly:

> Hence in the interpretation of language, the organizing concept that we need is not structure but system. (p.192) (My emphasis)

Halliday's emphasis on paradigmatic relations is, in my view, very much to be welcomed. It is useful, as Halliday says, to be able to view a literary text as a set of meanings 'each in its paradigmatic environment of what might have been meant (but was not)' (p.137). And the view of language as choice has obvious applications in the fields of sociology and computing. Within linguistics itself Richard Gunter (not a systemicist) was already complaining in 1966:

> ...the form of a generative grammar has tended to obscure the idea of the full paradigm of sentence varieties, and has done so through the great complexity of the set of rules. That is to say, in a set of generative formulae, the rule that produces one variety of some type of sentence may be far separated from the rule that produces another variety, so that the relationship between the two is obscured by a thicket of other considerations. (Gunter 1966:164)

In his systemic grammar, Halliday has certainly developed a form of grammar which makes paradigmatic relations easily recoverable.

But does a proper regard for the paradigmatic relations of language really entail neglect of the syntagmatic relations, as the quotation from Chapter 10 above and Halliday's practice in Chapter 6 would seem to imply? I cannot see that it does. It certainly did not in the work of Firth, or indeed in the early work of Halliday. I cannot see that it is either necessary or desirable to neglect the syntagmatic. On the contrary, the

scarcity in Chapter 6 of explicit reference to syntagmatic relations seems to me to have two very definite disadvantages:

(a) Halliday is depriving himself of one possible way of providing the missing definitions for the meanings represented in his networks. In fact, I would go further than to say one possible way. I would say that he is depriving himself of the best available way of defining such meanings.

There would seem, in general in linguistics, to be four ways of defining linguistic categories:

(i) on the basis of what they realise;
(ii) on the basis of what they are realised by;
(iii) on the basis of the paradigmatic relations into which they enter at their own level;
(iv) on the basis of the syntagmatic relations into which they (potentially) enter at their own level

But (i) and (ii), though available in linguistics generally, are ruled out for Halliday. (i) would entail defining meanings by reference to the situation and (ii) would entail defining meanings by reference to the lexicogrammar. For the purposes of Halliday's general theory, it is just as important that the individual meanings should be defined independently of the situation and the lexicogrammar as it is that the functional components should be independently defined. (See above).

(iii) would have the advantage of independence from the situation and the lexicogrammar, but there is nevertheless still a big disadvantage with paradigmatic definitions. Paradigmatic definitions are essentially negative and negative definitions have only a limited usefulness. If the paradigmatic definitions implicit in Halliday's networks were made explicit, this still would not get us very far. It would be of very little value to be told that exist was not possess, for instance. (exist and possess are represented as the two terms in one of the systems on page 118). Even if we added the information available from elsewhere in the network, such as that exist was also not be located and not move, we should still not be very much further forward. There are no doubt very many other meanings besides exist that are not possess, not be located and not move. We should not have accurately delimited exist until we had specified all the things that exist was not, until all possible other meanings had been accounted for. It is likely to be a very long time before linguists are in the happy position of being able to account for all possible meanings. If indeed this position can ever be achieved, since the number of meanings that can be communicated is presumably theoretically infinite.

(iv) shares with (iii) the advantage of independence from the situation and the lexicogrammar. It also has the additional advantage that syntagmatic definitions can be stated in a form that makes them immediately useful for the purpose of recognition

criteria when one is analysing texts. (Reliable recognition criteria are important both when one is analysing texts for their own sake and when one is analysing texts with a view to testing hypotheses derived from the theory. Only if there are reliable recognition criteria can analyses be replicable). For instance, A can be defined as something that predicts B. If we think we have recognised an A, we then have an immediate way of checking on our identification. If we think we have recognised something that predicts a B, we can ask ourselves the following questions: Is there in fact a B in the text following our putative A? If not, are we aware of the lack of a B to the extent that we recognise that predicted information is being deliberately withheld? If not, does there seem to be a breakdown in communication at this point, does the text seem to be ill-formed through some kind of error in reception or production? If the answer to all three questions is No, it is likely that our initial identification was wrong.

Syntagmatic definitions, then, would seem to be of more immediate use than paradigmatic definitions.

(This seems to assume that it is a case of either paradigmatic definitions or syntagmatic definitions. I would not really make any such assumption. I would advocate the inclusion of both - the more information the better. Indeed, I do not regard the syntagmatic and the paradigmatic as truly separable, a point to which I shall be returning. However, on the evidence of the quotation from Chapter 10 given above and on the evidence of his practice in Chapter 6, Halliday does seem to see an approach via the syntagmatic and an approach via the paradigmatic as alternatives rather than as essentially complementary. I am, therefore, endeavouring to discuss them in this way here. What I am saying is that if I were forced to choose between syntagmatic and paradigmatic definitions, I would choose the syntagmatic).

Given that it is desirable to include syntagmatic definitions of meanings, is it possible to define them in this way?

I would suggest that there are readymade syntagmatic definitions for some of Halliday's meanings already available in the work of the Birmingham discourse analysts. I can only guess what Halliday means by the terms on page 119 since he does not define them, but my guess is that his demand could be defined in the same way as Sinclair and Coulthard's directive, his ask in the same way as their elicitation, his state in the same way as their informative, his answer in the same way as their reply. (Sinclair and Coulthard 1975:e.g. 28 and 36). The usefulness of syntagmatic definitions for this kind of meaning was already apparent in the early work of Sinclair and Coulthard and their associates (Sinclair et al. 1972; Sinclair and Coulthard 1975). The usefulness of certain specific types of syntagmatic relation such as predictiveness and predictedness has since been further discussed by Coulthard and Brazil (1979) and by Stubbs (1981).

The Birmingham discourse analysts are likely to be of most direct assistance to Halliday in the area of what he calls interpersonal meanings. However, their approach is in principle extendable to all types of meaning, those which occur in written texts as well as those which occur in spoken texts. Sinclair and Coulthard do in fact offer what seems to me to be a helpful definition of meaning in general. For them, the meaning of an utterance is 'its predictive assessment of what follows' (Sinclair and Coulthard 1975:120).

(This view of meaning was implicit in my description of the first two types of meaning missing from Chapter 6. I was proceeding there, however, on a very ad hoc basis as I have not really made a detailed and systematic study of the register of linguistics!)

Another promising approach from this point of view is that of Leech (Leech 1969 and 1974; Butler 1982). If exist and possess, for instance, were treated as predicates, it is likely that each could be defined in terms of the arguments that could be predicted to accompany it.

Syntagmatic definitions seem then not only to be desirable but also to be practicable.

(b) To turn to the second disadvantage of the scarcity in Chapter 6 of explicit reference to syntagmatic relations.

Halliday draws attention to one particular manifestation of his shift away from the syntagmatic towards the paradigmatic. In Chapter 2, he says:

> ...a system is a set of options, a set of possibilities A, B or C, together with a condition of entry. The entry condition states the environment: "in the environment X, there is a choice among A, B or C". The choice is obligatory; if the conditions obtain, a choice must be made. The environment is, in fact, another choice (and here I depart from Firth, for whom the environment of a system was a place in structure - the entry condition was syntagmatic, whereas mine is again paradigmatic. (p.41). (My emphasis).

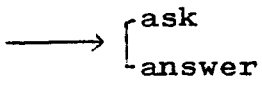
This is, in fact, not only a departure from Firth; it is also a departure from the earlier Halliday, where the entry conditions were specified first in syntagmatic terms, then more delicately in paradigmatic terms:

> The point of origin is specified syntagmatically, so that all features are associated with a syntagmatic environment; at the same time the network provides a paradigmatic environment for each one of the features, specifying both its contrastive status and its possibilities of combination. (Halliday 1966:62) (Again my emphasis).

Halliday gives no reason for this departure from his earlier position. I can myself see no advantage at all in the new position, only disadvantages. I will first discuss a number of general theoretical problems which I think it raises. I will then return to what I see as being the main disadvantage of the new position for the theory being outlined in Chapter 6.

If we abandon the old constraint on systems that each system must operate at a given place in structure, what then is a system? What then are paradigmatic relations? I am no longer sure that I know the answers to these questions.

To take a specific example. One of the systems in the network on page 119 is



In what sense is this a system? Not in the old sense, since the two terms are not available at the same place in structure. One can only answer after someone else has just asked. Nor can it be said to be a system in the sense that it represents a choice. To say that one has a choice between asking and answering is as bad as saying that one has a choice between going to bed and getting up again; or a choice between borrowing a book from the library and taking it back again. (It is also incidentally, though on a rather different plane, as bad as saying that one has a choice between the syntagmatic and the paradigmatic!). The two terms are not mutually exclusive. The normal expectation is that if one of them occurs then they will both occur. Ask predicts answer. Answer presupposes ask.

On what grounds are these terms said to be paradigmatically related? How does one decide that terms are paradigmatically related if one has no reference point in structure? Again, what is a system?

The main disadvantage of Halliday's new position from the point of view of the theory which he is outlining in Chapter 6 is that he is preventing himself from making accurate predictions of the type that he apparently wishes to make and from accounting for facts of the type that he apparently wishes to account for. (I say apparently since, as I indicated above, he is not very explicit about this).

Let us take an example in order to see what kinds of fact Halliday is likely someday to be able to predict and account for on the basis of his current theory and what kinds of fact he will never be able to predict and account for. What kinds of fact he will never be able to predict and account for, that is, as long as he continues to refuse to attach systems to places in structure and as long as he consequently feels free to set up systems such as ask/answer.

Let us assume that Halliday is describing the register associated with friends chatting to each other while watching a cricket match and that he is contrasting this with, among other things, the register of the formal proceedings in a court of law. Let us assume that we as informants are all agreed that the following utterances would be appropriate if they occurred in a cricket-watching conversation but inappropriate if they occurred in a conversation which was part of formal legal proceedings:

(1) What do you think of Boycott's bowling?
(2) Do you know where the next test match is going to be?
(3) Isn't it a nice day?
(4) How long is it to the tea interval?

Halliday's theory as at present constituted does offer some hope that he will eventually be able to describe situational/cultural factors, meanings, lexicogrammatical forms, and the interrelations between the situational/cultural factors, the meanings and the lexicogrammatical forms, in such a way as to be able to accurately predict such appropriateness judgements.

However, although we would probably regard utterances (1) to (4) as appropriate to cricket-watching conversations in general, we would probably not regard them as appropriate at all possible points all the way through a cricket-watching conversation. For instance, we would probably not regard (3) as appropriate if it occurred immediately after (1) and we would probably not regard (4) as appropriate if it occurred immediately after (2).

*(5) A. What do you think of Boycott's bowling?
B. Isn't it a nice day?

*(6) A. Do you know where the next test match is going to be?
B. How long is it to the tea interval?

I am not saying that (5) and (6) would not occur. The important question is: What would happen if they did occur? I would suggest that in each case A would be at least momentarily surprised by B's utterance since it would not be expressing the meanings that he was expecting. I would suggest that A would then try very hard to translate B's utterance into something that did express the meanings that he was expecting. In the case of (5) for instance he might well decide that what B really meant was that he thought so little of Boycott's bowling that he thought the matter was better not discussed. If A failed to find any hidden meaning in B's utterance - I find it very difficult myself to read any sort of hidden meaning into B's utterance in (6) - then A would probably conclude that B had just not been attending to him properly. He would no doubt protest.

Halliday would be unable to predict A's reactions or to account for them if they occurred. Assuming that Halliday would wish to set up an ask/answer system for the cricket-

watching register as he did in Chapter 6 for the toy-train-playing-with register, this would imply that ask and answer were true alternatives, that they would be equally available all the way through a cricket-watching text. If ask and answer were equally available all the way through a cricket-watching conversation, then A would have no reason to expect an answer rather than an ask from B. He would have no reason therefore, to be surprised at B's utterance, no reason to search for something that would convert B's apparent ask into an answer, no reason to be dissatisfied if no hidden meaning were discoverable.

Sinclair and Coulthard, on the other hand, would be able to predict and account for A's reactions. For Sinclair and Coulthard, elicitation and reply are not in the same system since they are not available at the same place in structure. (I am still assuming that Sinclair and Coulthard's elicitation and reply are equivalent to Halliday's ask and answer). Sinclair and Coulthard in fact are explicit about the place in structure at which each of these meanings is available. Elicitation forms a system together with directive, informative, and check, this system operating at head in a move acting as initiation. Reply forms a system together with react and acknowledge, this system operating at head in a move acting as response (Sinclair and Coulthard 1975:26). The two systems are syntagmatically related. Each of the terms in elicitation's system predicts one of the terms in reply's system.

This explicitness on the part of Sinclair and Coulthard, about the relations between meanings and places in structure, would enable them to predict the ill-formedness of (5) and (6). Each of B's utterances is a case of an elicitation, one of the meanings associated with initiation, occurring in a slot where reply, one of the meanings associated with response, would have been expected. This ill-formedness would account for A's surprise at B's utterance. A would then have to decide whether the deviance was deliberate in order to convey a hidden meaning or accidental owing to inattention. Assuming Grice's co-operative principle (Grice 1975), A would try first to find a hidden meaning. Failing that, he would assume that his friend had just not been attending.

A's reactions would be an example of someone making 'sensible guesses' about what someone else is likely to mean in order to decode that other person's utterances. Such 'sensible guesses' do seem to be one of the kinds of fact that Halliday is trying to account for (pp.108 and 109-110). At present Sinclair and Coulthard appear to be rather more successful at accounting for this kind of fact than Halliday.

The problem is that Halliday is failing to take account of the fact that meaning potential varies not only in relation to the situation type and the code, but also in relation to the point reached in the syntagmatic chain of the discourse. Halliday's current theory offers some hope that it may someday be possible to give a precise account of the variation of meaning potential in relation to the situation type and code. But as far as I

can see, there is nothing in his theory at present which offers any hope at all of it ever being possible to give a precise account of the variation of meaning potential in relation to the discourse structure.

Yet if Halliday really wishes to predict with any accuracy who will mean what when and who will expect what meaning when, the latter type of prediction leading to further predictions about who will consider what meaning appropriate when and who will be able to guess what meaning when in order to decode condensed utterances, then in my view he must take account of the second kind of variation as well as of the first kind.

Halliday is aware of this second kind of variation (p.139). But he seems to have abandoned hope of ever being able to account for it properly. My point is that one can account for it, simply by going back to the Firth and early Halliday position and attaching systems to places in structure, thereby showing that meaning potential varies from point to point in the syntagmatic chain of the discourse. It is precisely because they have never abandoned the old position that Sinclair and Coulthard would be able to account for the facts that I have discussed above. For them the meaning potential at initiation is different from the meaning potential at response. Any attempt to substitute a meaning associated with initiation for a meaning associated with response will result in ill-formedness.

I am saying, then, that Halliday's neglect of syntagmatic relations is hampering him in two ways in the development and testing of his theory; it is hampering him in the making of accurate predictions about the availability and expectedness of meanings; it is hampering him in the provision of precise definitions which would make possible the replicable analyses necessary for the testing of his hypotheses.

4.5. Rules

Most written texts about linguistics by linguists for linguists include proposals for rules, these rules being a way of making precise claims which are translatable into testable hypotheses.

There are no proposals for rules in Chapter 6. This is another type of meaning that Halliday is explicitly denying himself. He says:

> It has been customary among linguists in recent years to represent language in terms of rules. In investigating language and the social system, it is important to transcend this limitation and to interpret language not as a set of rules but as a resource. ...Most recent linguistics has been structure-bound (since structure is what is described by rules). With the notion of system we can represent language as a resource, in terms of the choices that are available, the interconnection of these choices, and the

> conditions affecting their access. We can then relate these choices to recognizable and significant social contexts. (pp.191-2). (My emphasis).

Halliday's dislike of rules seems to be symptomatic of a general dislike of formalisation and idealisation:

> Language, unlike mathematics, is not clearcut or precise. It is a natural human creation and, like many other natural human creations, it is inherently messy. Anyone who formalizes natural language does so at the cost of idealizing it to such an extent that it is hardly recognizable as language any more, and bears little likeness to the way people actually interact with one another by talking. (p.203)

For Halliday, then, rules, structure, formalisation, idealisation are on one side of a fence, while resource, system, choice, relation between meaning and social context, accounting for the way in which people actually interact with each other by talking are on the other side of the fence. I question whether these two sets really are in opposition. Is it true, for instance, that rules really are about structures and have nothing to do with choices, relations between meanings and social contexts, the way people actually interact with one another by talking?

It seems to me that Halliday is confusing limitation in practice with inherent limitation. He is assuming that, because rules <u>have</u> only been used in a certain way, they necessarily <u>can</u> only be used in that way.

I agree with Halliday that <u>most</u> recent linguistics has been limited in its scope. It has, in fact, been even more limited than Halliday suggests in the passage quoted above. It has not only been structure-bound; it has been <u>sentence</u>-structure bound. It <u>is</u> true that <u>most</u> of the rules that have been proposed have been about sentence-structure. However, I do not believe that this is the only connection in which rules are appropriate. I would suggest that there are three ways in which the notion of <u>rule</u> might usefully be extended - in one case already <u>is</u> being extended - to account for aspects of language with which Halliday himself is centrally concerned:

(a) To account for 'the way people actually interact with one another by talking'.

Discourse analysts have already broken free from the limitations in practice of most recent linguistics. It used to be thought that discourse data was inherently too 'messy' to be suitable for idealisation, formalisation and the proposing of rules. However, it has now been shown that it <u>is</u> possible to propose rules for discourse. To mention just a few examples of such sets of rules: Labov and Fanshel include a whole chapter entitled 'Rules of Discourse' (Labov and Fanshel 1977:71-111);

Sinclair and Coulthard's explicitness about syntagmatic relations amounts to a set of rules for discourse structure (Sinclair and Coulthard 1975:especially 25-27); Grice's maxims are yet another form of rule for discourse (Grice 1975).

Such rules are not only possible; in my view they are also extremely insightful. And insightful in relation to those aspects of language about which Halliday himself would wish to provide insights. Far from bearing 'little likeness to the way people actually interact with one another by talking', their value lies precisely in that they do enable us to account for such interaction.

Examples (5) and (6) will again serve as illustrations here. Sinclair and Coulthard have not only paid attention to syntagmatic relations; they have formulated precise rules about these relations. It was the existence of Sinclair and Coulthard's rules, together with Grice's maxims, that made it possible to account in (5) and (6) for A's reaction to B's utterance. Without the existence of such rules there would have been no way of predicting what meanings A expected from B and no way of predicting A's processes of interpretation when B's utterance failed to match up to his expectations. Since the rules did exist, it was possible to account both for A's expectations of B and for his reactions to B's actual utterance. What else is this but accounting for 'the way people actually interact with one another by talking'?

Halliday seems to have misunderstood exactly what is meant by a linguistic rule. The nature of linguistic rules is helpfully considered by Labov and Fanshel (1977:74-76) and by Stubbs (1981:109). The important point is that a rule such as A predicts B is not to be taken as a claim that A always will be followed by B; it is a claim that A will will always be expected to be followed by B and that whatever does follow A will be interpreted in the light of this expectation. The rule is not inviolable from the point of view of what will actually occur, but it is invariant in that the existence of the rule will always be assumed for the purposes of interpreting what occurs. Thus Sinclair and Coulthard's claim that an elicitation predicts a reply is not a claim that an elicitation always will be followed by a reply; it is not a claim that examples such as (5) and (6) will never occur. It is a claim about an expectation that the first speaker will have of the second speaker, an expectation that the first speaker will make use of when interpreting and evaluating the second speaker's actual utterance.

Halliday himself says:

> There is always, in language, the freedom to act untypically - but that in itself serves to confirm the reality of the concept of what is typical. (p.226)

It seems to me that this is just exactly what such rules succeed in capturing. We may act untypically, but we ourselves and

anyone else observing us usually know that we are acting untypically. We and our observers interpret and evaluate our actions in the light of this knowledge. The rules specify what is typical, thereby providing a basis for an explanation of our recognition, interpretation and evaluation of the untypical.

I would suggest to Halliday, then, that it is already both possible and insightful to extend the use of rules beyond the bounds of sentence-structure.

Indeed I would say that it is essential to extend the use of rules in this way. Stubbs says:

> Many structural analyses of spoken discourse have now been published, but little attempt has been made to motivate different rival analyses of the same data, and to decide which analysis is the best. This is a powerful procedure and is standard in phonology and syntax, where much of the literature consists of analyses followed by counter-examples and rival analyses. A prerequisite of such a procedure is, of course, the statement of analyses in a form which allows counter-examples to be searched for and found, that is a degree of formalisation. (Stubbs 1981:107)

In my view the procedure advocated by Stubbs must be adopted not only by discourse analysts proper but also by other writers such as Halliday who are interested in accounting for 'the way people actually interact with one another by talking'. How else are we ever to progress from a vague, tentative outline of a theory to a detailed account in which it is possible to have some confidence? And, as Stubbs says, if we are to adopt this procedure then we must state our analyses in a form which makes the procedure possible. How else are we to do this than by proposing explicit rules? (It would, of course, be possible to provide precise formalisations and not call them 'rules'. But Halliday is surely not just quarrelling over terminology. What I am saying is that we must formalise, and if we are going to formalise, then we might as well call our formalisations rules).

(Far too little use is made in systemic linguistics generally of the procedure advocated by Stubbs. It is because we do not adopt this procedure that our work is not taken seriously by other linguists).

(b) To account for 'the choices that are available, the interconnection of these choices, and the conditions affecting their access'.

Discourse analysts, then, are already explicitly extending the use of rules beyond the bounds of sentence-structure in such a way as to account for one of the aspects of language with which, according to the evidence of the paragraphs I

quoted at the beginning of the section, Halliday himself is centrally concerned. I would now like to draw attention to another aspect of language mentioned in those paragraphs, in which the existence of rules again seems to me to be already being assumed by linguists (especially systemic linguists), though this time the assumption is implicit rather than explicit.

Halliday himself says:

> a system is a set of options, a set of possibilities A, B, or C, together with a condition of entry. The entry condition states the environment: 'in the environment X, there is a choice among A, B and C'. The choice is obligatory; if the conditions obtain, a choice must be made. (pp.40-41)

This seems to me to imply the existence of rules about the availability and obligatoriness of choices.

A system network could, in fact, be seen as a set of proposals for rules: rules about when particular choices can and must be made; rules about what particular options can be combined and about what particular options cannot be combined. The only thing that stops me saying that, in spite of his protestations to the contrary, Halliday has included rules in Chapter 6 in the form of his system networks is the general lack of explicitness about these networks. We are again back to the problem of the absence of precise definitions. A rule relating two things neither of which one can be sure of recognising reliably is not really very much of a rule.

There would seem to be three stages in the recognition of rules. The first stage is the assumption that regularities exist and that these are describable. This is the stage represented in the quotation from Halliday which I have just given. The second stage is the attempt to work out in detail particular instances of these regularities. This is the stage represented by particular system networks. The third stage is the explicit acknowledgement that, when one is attempting to work out in detail particular instances of regularities, what one is and should be doing is writing rules. This is the stage which most systemic linguists have not yet reached.

It could, of course, again be argued that the question of whether one moves on from stage 2 to stage 3 is a purely terminological question. If one recognises that regularities exist and if one is attempting to describe particular instances of those regularities, does it matter whether one calls what one is doing 'writing rules'?

I think it does matter. There seems to be an association between explicit statement of intent to write rules and the degree of explicitness actually attained in stage 2. It is noteworthy that Hudson, whose English Complex Sentences I

would regard as the most explicit attempt yet at writing a systemic grammar, does see himself as writing rules (1971:e.g.56). Halliday, on the other hand, seems to be using the opposition which he has set up between rule and resource as an excuse for inexplicitness. What is worse, he seems to be encouraging other linguists to follow his example.

If more systemic linguists drawing up system networks consciously set out to write rules, this might well lead to greater explicitness in systemic linguistics generally. This would in turn facilitate the use of the procedure advocated by Stubbs.

(c) To account for the relationships between 'choices' and 'recognisable and significant social contexts'.

So far I have discussed one area of central concern to Halliday in which linguists have progressed through all three stages in the recognition of rules, and one area in which most linguists are still at stage two. I now come to an area in which very little attempt has been made to progress beyond stage one.

As Enkvist's useful survey article shows (Enkvist 1980), a vast amount of work is now available on the relations between language and situation/culture. All the works cited by Enkvist seem to assume that there are regularities in the relationships between linguistic features and situational/cultural factors. Yet, relatively few of the works attempt to determine in any precise detail exactly what form these regularities take, still less to propose explicit rules. Far too many of the works are just lists of vague general headings which may or may not prove useful if one waves them hopefully in the general direction of a text.

Many of the linguists working in this field seem in fact to share Halliday's prejudice against idealisation and formalisation, a prejudice indeed against any real form of explicitness. As Enkvist says:

> In recent linguistics there has been a polarity reminiscent of that between the ancient analogists and anomalists. At one pole are the reductionists. They want to study imaginary, ideal speakers in imaginary, ideal homogeneous speech communities and to view language as a code, while deliberately excluding the real world in which communication takes place. At the other extreme are those who insist that no linguistic inquiry can be meaningful unless it comes to terms with the whole complexity, variation, flux and categorial fuzziness of natural languages.

Enkvist seems to place himself in the second camp, since

> students of language varieties are at once committed to the study of contexts: only contexts can show when each variant is used. (Enkvist 1980:75)

It is true, as Enkvist indicates, that this polarity exists. But need it exist? Is it true, as seems to be assumed, that if one is dealing with a 'messy' aspect of language, such as relationships between language and situation/culture, then one must necessarily proceed in a messy way? As I have said, it seems to be agreed that there are regularities in the relationships between language and situation/culture, which are recognisable in spite of the 'messiness'. Why then can we not propose explicit rules to capture these regularities? This is all that is meant by idealisation and formalisation: an attempt to distinguish explicitly between regularities and irregularities. There is no denial that the irregularities exist.

The discourse analysts have set an example in showing that one area previously thought to be 'messy' can in fact be studied in a very precise way. It is an example that those of us interested in relationships between language and situation/culture might well attempt to follow. We should make very much more effort to propose explicit rules. Though our proposals, like those of the discourse analysts, would be on the understanding that our rules were not an attempt to predict what would occur; they would be an attempt to predict what would be expected to occur, thereby accounting for the ability which all of us have to distinguish typical language/situation/culture relationships from untypical ones.

The analogy with discourse analysis is particularly appropriate. Discourse analysts have mainly been concerned with syntagmatic relationships, though not syntagmatic relationships of the kind most usually studied by linguists. The relationships between linguistic features and situational/cultural factors are surely also syntagmatic relationships, though again not of the kind most usually studied by linguists.

A situational/cultural factor and a linguistic feature with which it normally co-occurred could be thought of as jointly forming a structure. I would then like to see attempts to write 'grammars' for these 'structures', 'grammars' which would be sufficiently explicit to distinguish the 'grammatical' co-occurrences of situational/cultural factor and linguistic feature from the 'ungrammatical' co-occurrences. (Or, if Halliday prefers these terms, to distinguish the typical co-occurrences from the untypical).

I have developed these points in greater detail elsewhere (Berry 1980 and forthcoming). As I have indicated there, Hasan (1978) already seems to me to have begun to work along the lines that I am proposing.

To sum up what I have been saying in section 4. Halliday's present statement of his theory lacks precision: in its failure to formulate specific hypotheses and to show how these could account for data; in its failure to provide definitions which would make analyses replicable and allow

hypotheses to be reliably tested; in its failure to distinguish between what has already been accomplished towards the construction of the theory and what remains to be done. I am suggesting that the lack of precision is, at least in part, due to: inattention to syntagmatic relations; an unwillingness to engage in any kind of explicit formalisation.

5. Conclusion

I have been severely critical of certain aspects of this book. To redress the balance I would like to conclude by emphasising that I find Halliday's vision of a sociosemiotic theory of language extremely attractive. And in his check list of concepts which might well turn out to be relevant to such a theory I think he has gone a long way towards enabling such a theory to be constructed. It is precisely because I would like to be able to follow his lead in working towards the construction of such a theory that I am asking for greater precision of definition and for more explicit and more systematic attempts to relate theory and data. When Halliday criticises other linguists for the limited scope of their investigations, I am in complete agreement with him. When he criticises them for their methodology, I do not agree at all. I do not see how Halliday's own ends are ever to be achieved, how his vision is ever to become a reality, without account being taken of introspective data as well as of textual data, without due weight being given to syntagmatic relations as well as to paradigmatic relations, and most important, without the formulation of 'rules' enabling precise predictions to be made and hypotheses to be tested.

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5. Diagrams in the text should be drawn carefully in ink, as they are to appear in the final camera-ready page.

continued

6. Example sentences or phrase-markers should be numbered and put on a separate line or lines, thus:

   (1) *Time was done by her at Holloway.

   Examples in phonetic script should use IPA, and symbols not available on the author's typewriter should be written carefully in ink.

7. Single quotation marks should be used throughout, without distinction of purpose; double marks should be confined to quotes within quotes.

8. Please note that we are bound by normal copyright laws, and cannot therefore publish, without permission, complete poems, short stories, etc. (however short), or complete maps, diagrams, tables, etc. from published books or articles. Extracts, of different lengths for prose and poetry, can be published without permission. Permission is not usually difficult to obtain, but may take time. Publishers often make a small charge for such permission and this charge will be paid by authors of articles. Please ask the editors if in doubt about what may be safely quoted.

9. Reviews should be headed by the title of the book in this form:

   Bernard Comrie & Gerald Stone The Russian Language Since the Revolution, London: Oxford University Press, 1978 Ppxi + 258, £10.

   The name of the reviewer should be at the end, followed by affiliation and/or address. Otherwise, reviews should follow the conventions for articles.

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NLC 8.2. December 1979. Includes J. Coates (on computational linguistics); Connolly (on language change); Foster (on child language); Richardson (on discourse).

NLC 9.1. June 1980. Includes Chan (on stylistics); Cheshire (on non-standard English); R. Coates (on Korean); Pincas (on teaching English); Pountain (on teaching Spanish); Walker (on Frisia).

NLC 9.2. December 1980. Special issue on Syntax and Semantics. Wales (on the pronoun 'one'); Killingley (on Cantonese); Stubbs & Berry (on English verbal groups); Durkin (on English prepositions).