

2 Reading, grammar and the line

David Crystal

There are now several subjects with 'linguistics' as part of their titles which promise to make a contribution to our understanding of the nature of reading. Psycholinguistics is perhaps the most widely known, focusing as it does on the processes underlying the production and comprehension of language. Sociolinguistics is perhaps less widely known in this field, but has considerable potential in its concern to specify the functions of language in relation to different social situations. As a third example, there is neurolinguistics, where recent attention has been increasingly directed towards the investigation of language disorders. Because of their interdisciplinary orientation, such approaches are likely to be able to provide models of reading that are more explanatory than any single subject, such as linguistics or psychology, alone. Nonetheless, my aims in the present paper are restricted to aspects of linguistic study as such. My justification is that, despite the attraction of model-building at an interdisciplinary level, a great deal of elementary spadework of a purely descriptive kind needs to be done and this in the first instance needs to be considered on its own terms. A theory is only as valid as the data it accounts for and it is a matter of concern that much of the data of reading still remains undescribed. Indeed, in several cases, it is unclear whether we would agree as to what the nature of the data should be; and there would certainly be disagreement over the terminological means we should choose in order to describe it.

As a linguist, then, I do not see it as my job to construct a model of the reading process, but I am anxious that when people try to do so they pay proper attention to the need to describe the linguistic elements of such a model precisely

and comprehensively. Linguistic study has two obvious roles in relation to reading. First, it is needed in order to specify the nature of the input to the reader. This will include a description of the text to be read, as well as of the nature of the language available in the reader which he can bring to bear on the task (his prior language acquisition, in the case of the child). Second, it is needed to specify the nature of the reader's output, in descriptions of the process of reading aloud, of his writing, or of his derived linguistic behaviour (such as his responses to a comprehension task). In each of these areas, the need for precise descriptions is still paramount. It is still often difficult to compare pieces of research because the nature of the linguistic variables has been insufficiently specified. For instance, let it be agreed that one should 'read for meaning'; but what is the nature of the units of meaning out of which a text is constructed? Let it be agreed that a measure of readability will include a test of comprehension of some kind; but again, what are the units in the text which lead to a particular judgment being made? There are several such questions.

To illustrate this point, it is not necessary to go into great detail within branches of linguistic enquiry, but simply to concentrate on the major distinctions which need to be made. By using no more than the old three-level model of language (reviewed in Crystal (1976) for instance) a great deal can be said. This model sees language as comprising: meaning (*semantics*), *grammar* (morphology and syntax), and mode of transmission (writing and speech, in particular, analysed in terms of graphology and phonology respectively). The questions which the reading analyst has to ask are how far these levels are useful in clarifying the structure of the input and output data referred to above, and whether one can establish any interesting correlations between them, in relation to the reader's response to his text. It is important to phrase the questions in terms of reading response. It will not necessarily be the case that the insights into the nature of spoken language gained by applying these levels will be paralleled when they are applied to the written language. The latter must be studied afresh, in its own terms. (It is perhaps ironic that, after several decades of linguists arguing for the necessity to study speech without reference to the written language, one must now stress that

studies of the written language must also be independent, without prejudging issues in terms of the study of speech.)

The need for comprehensiveness is referred to above. I have been unable to find any reasonably comprehensive account of what is involved, even at a descriptive level. As a starting point, let me take a recent statement of the way in which print is said to be organized. It is part of the discussion of levels of response to print in the original Open University course PE261 (Unit 5, p.9). They specify five main levels: (i) letter; (ii) letter cluster; (iii) word; (iv) sentence; (v) paragraph. These levels, it would seem, they see to be organized hierarchically, in that they increase in the amount of information they carry, and seem to be in a relationship of inclusion (a paragraph consists of sentences, which consist of words, and so on). Also 'other levels could be added, such as the phrase, the clause and the chapter or story'. Ultimately, of course, it will be necessary to try to define the nature of the differential behavioural responses which such a series presumes to relate to, but in the first instance it is more important to ask the question, How far is this set of units a coherent or comprehensive account of textual organization?

It takes little reflection to see that units are neither coherent nor comprehensive. To begin with, the units recognized above are based on different criteria. There is not a single hierarchy here at all, but bits of different hierarchies. Putting this another way, the nature of the 'information' varies from level to level, as can be seen by using the language model referred to above:

- 1 Letter and letter cluster: this is purely graphological progression (though some might argue that semantic analysis is directly applicable to some clusters, as in the suggestion of sound symbolism).
- 2 Word and sentence (clause, phrase, etc.): this is a series of grammatical distinctions, in the first instance; some semantic correspondences are involved, and some reference is needed to graphology for some of the units (word and sentence, using spacing and punctuation).
- 3 Paragraph, chapter, story, etc: this is a primarily graphological progression, with a major semantic

correspondence involved; much recent research has been devoted to the attempt to apply grammatical techniques also to the analysis of these larger stretches of language ('text' or 'discourse' analysis), but so far with limited success (see Sinclair and Coulthard 1975).

- 4 If the correlation with phonology is to be introduced, as several views of reading would insist, then we are faced with a varying interdependence – strong, in the case of letters and clusters; less strong, in the case of words and sentences; and almost absent elsewhere. The point is taken up below.

Several textbooks operate with a notion of organizational levels similar to the above, though often lacking in detail. 'Letter/word/sentence' is a sufficient sequence for many writers. But it is doubtful whether this kind of selection is very meaningful or coherent, if more than a single continuum is involved, and thus more than one type of response pattern expected. On the other hand, the notion of 'levels of organization' seems to be an intuitively important one to be able to salvage, as it is one way in which the concept of 'reading response' might be made more specific. Let us then see what happens if the linguistic criteria above are applied systematically. All four dimensions will be relevant – graphological, phonological, semantic and grammatical. It will make sense to begin with the graphological, and relate other dimensions to this one, in view of my earlier comment about studying writing in its own terms; I shall pause to discuss only those notions which have been particularly neglected or which are particularly controversial.

Under the heading of graphology, it is possible to distinguish fourteen levels of textual organization, all intuitively recognizable. There may be others that I have failed to notice:

- 1 feature of letter (allograph)
- 2 letter (grapheme)
- 3 letter cluster
- 4 graphic syllable (as represented conventionally, in dictionaries etc.)

- 5 graphic word (i.e. the letter-sequence surrounded by white space)
- 6 word cluster (as demarcated using punctuation, or some other typographical highlighting convention, such as bold face)
- 7 line (the most neglected of all graphological units – see below)
- 8 line cluster (again, as typographically demarcated, as when a series of lines are printed in italics, or indented)
- 9 paragraph
- 10 paragraph cluster (as typographically demarcated, as when a series of paragraphs is set off in a set of instructions; *cf.* Wright 1977)
- 11 layout (for present purposes, this term is given a restricted sense, referring only to the distinction between text *v.* non-text on a page)
- 12 page
- 13 page cluster (as typographically demarcated, as in a section, chapter, etc.)
- 14 text (book, magazine, etc.).

If we now take these fourteen units and attempt to correlate them with the other linguistic levels, some interesting differences and similarities suggest themselves:

- 1 letter feature: in phonology this correlates with the notion of distinctive feature of sound; no equivalent in grammar or semantics;
- 2 letter: in phonology, correlates with the phoneme; no systemic equivalent in grammar or semantics (an occasional correspondence exists, as when an individual letter or letter cluster signals a grammatical morpheme, as in 'adding an *s*' for plural);
- 3 letter cluster: in phonology, correlates with the phoneme clusters as described by the language's phonotactic roles; no systemic equivalent in grammar (but *cf.* (2) above) and semantics (with the possible exception of sound symbolism);
- 4 graphic syllable: correlates partly with the phonological syllable; no equivalent in grammar and semantics;
- 5 graphic word: correlates only partly with the phono-

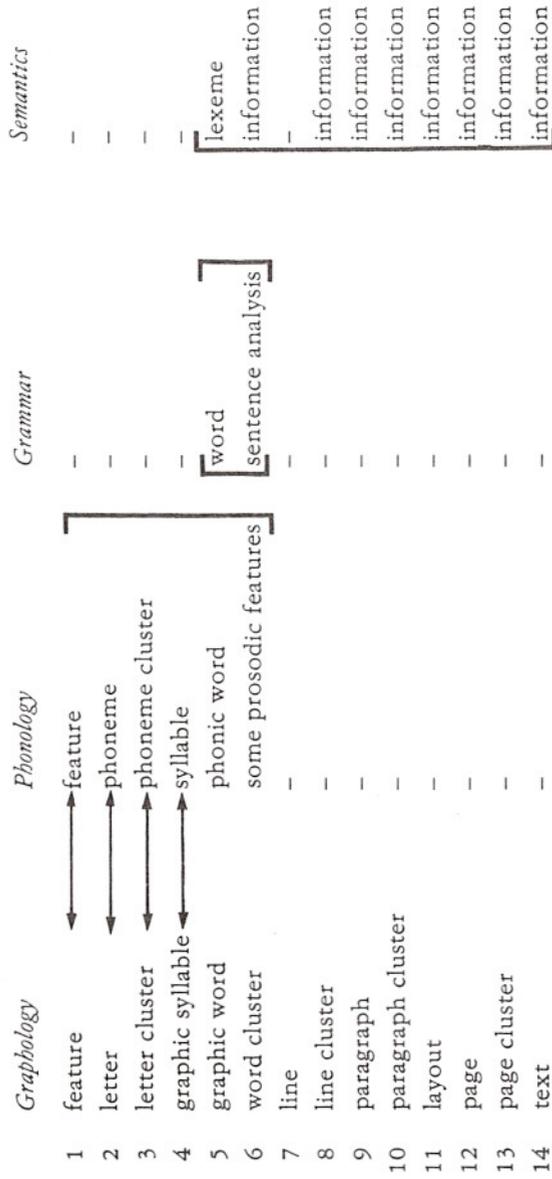
logical word, defined in terms of stress, structure, etc., partly equivalent to the notion of grammatical word, and with the semantic action of letters on the many definitions of the 'word' (see Robins 1970 and Lyons 1968);

- 6 word cluster: correlates partly with some prosodic features, such as extra loudness and pause; no regular correlation with grammar; presumably a storable relationship with semantics, e.g. the expression of important or summarizing information (no attempt will be made in this paper to categorize the types of semantic information realized by the formal distinctions represented – the general label 'information' will be used solely as a reminder that this level is relevant);
- 7 line: no phonological correlation (except in relation to the metrical line in poetry, see Crystal 1971); no equivalent in grammar or semantics;
- 8 line cluster: a possible but unclear phonological correlation; no obvious correlation with grammar (other than in certain very general features, such as consistent tense reference – a point which applies to all higher-order stretches of language); presumably correlates with a storable information structure in semantics;
- 9 paragraph: no phonological correlation (apart from in a few styles, such as newsreading, where prosodic features often mark units of text); no predictable grammatical correlation; some suggestion of a storable informational structure in semantics;
- 10 paragraph cluster: no phonological or grammatical correlation; presumably a storable correlation with informational structure in semantics;
- 11–14 layout, page, page cluster and text: as (10).

A schematic representation of this information (see Figure 1) brings to light some interesting features:

- (a) Factors 1–4 demonstrate a regular correspondence between graphology and phonology only,
- (b) Factors 8–14 demonstrate a regular correspondence

Figure 1 Schematic relationship between graphological features of text and other linguistic levels



- between graphology and semantics only,
- (c) Factors 5 and 6 are central to this schema, in that these are the only factors where there is some kind of stable correlation between levels; grammar seems to have a pivotal role in interrelating graphology to prosody and semantics. Moreover, when one considers the subdivisions within grammar, in the light of this correlation with graphology, one reason for the centrality of the notion of sentence becomes clear; this is the only notion which is in principle capable of being used at each graphological level. It may be coterminous with a letter (e.g. an alphabet book label), a letter cluster (e.g. *ssss* of a snake), a syllable (e.g. *John*), or a word (same example); a word cluster (e.g. . . . *any more to say*, *THIS MUST STOP*, *I say again . . .*); a line or line cluster (examples are obvious); a paragraph (may consist of a single sentence), as may a paragraph cluster (as in some instructional language, where the main clause is outside a set of subordinate clauses set off as paragraphs); layout (as when a diagram is part of a sentence, as in many scientific texts – see again Wright 1977), and page. It is, I suppose, possible in principle to have a larger unit coterminous with a sentence – even a text? – though admittedly this is somewhat unlikely! Given the typographical ubiquity of the sentence, its traditional definition in punctuational terms evidently leaves much to be desired.
- (d) The remaining factor, 7, the line, is unique. It stands out in that it is the only factor which has no stable correlation with any other level. It also seems to be a particularly significant boundary, from the point of view of phonology: above this, there is some degree of correlation with phonology; below this point there is none. This suggests that the line may have a particularly important role to play in interrelating the two main views of reading, the ‘synthetic’ approach of letters → words → sentences etc., and the ‘analytic’ approach (of text → paragraphs → sentences etc.). It certainly makes the lack of reference to the line, in the accounts of reading organizational levels above very surprising. Perhaps this is because the line is so ambivalent; its very ambivalence suggests it may be a fruitful area for

experimentation into readability.

Indeed, several studies have been made concerning the role of lines in readability (usually measured in terms of speed of reading plus some kind of comprehension check). What suggests itself immediately is that if lines as conventionally represented (i.e. with justified right-hand margins) have no apparent linguistic purpose then they must be an unfortunate distraction in learning to read, imposing boundaries where there are none, and taking up valuable visible processing time (often painfully apparent, while a child searches for the beginning of a new line, trying at the same time to retain the old). [There are of course many arguments based on aesthetic and economic considerations, which would have to be taken into account in any total appreciation of the notion of the line. The linguistic implications, however, can be discussed without reference to these factors, whose relevance to our understanding of readability is in any case obscure.] One might try to do without lines, in a sense, by producing texts which could be of great horizontal length (as has been attempted). More practically, one might attempt to turn the notion of line to linguistic advantage, and this is where most work has so far been done, largely by a further application of Miller's fruitful notion of 'chunking' of text as an aid to memory, recall, etc. The obvious suggestion, again, is to leave the lines unjustified, and to make a line correlatable with some linguistic unit. The big question is, Which?

Research into line justification and readability has so far had mixed results, suggesting that in some respects the question is not a particularly fruitful one; but from the point of view of reading acquisition there is a great deal of potential still in this field of research. The main conclusion of Zachrisson (1965), Fabrizio *et al* (1967), Cromer (1970) and others is that for a mature reader, whether a line is justified or not, and whether amount of space between words varies or not, makes little or no difference. Hartley and Burnhill (1971), for instance, examined whether some methods of setting unjustified text were more efficient than others, and found no significant results between making syntactic divisions or not for their informants (first-year students). They concluded that unjustified text can be quite

markedly manipulated without affecting reading speed or comprehension. Likewise, Carver (1970) modified line endings and spacing, and produced five different unjustified formats to see whether there was any evidence of a facilitating effect due to chunking. In his mature readers, however, there was no evidence that efficiency is improved.

Hartley and Burnhill specifically excluded slow readers, people with learning problems and children from these results, and indeed there is some evidence in these studies to suggest that poor readers do find some kinds of justified lines more difficult. Carver (1970), for example, found that this was so only for relatively short line length (about seven words); when line length was twelve words, this was no longer a disadvantage. He interpreted this to mean that spacing was the most relevant factor (space differentials would be less in the twelve-word line). Cromer (1970) grouped words into constituent phrases in sentences by extending the amount of space at phrase boundaries. He too found comprehension of this kind of text superior in poor readers. Other indications of the potential of chunking were provided in varying experimental settings by Graf and Torrey (1966) and North and Jenkins (1951).

In all of this, however, little attention has been paid to the linguistic nature of the chunks of unjustified text, as defined grammatically. There has been a preoccupation with quantitative indices – with line length, in particular, and with spacing size. This is not to deny the importance of length and spacing in line readability; unpredictable spacing, for example, is a disadvantage, as Burt (1959) and others have shown. But there is a great deal more to it than this. Some attempt has been made to classify lines qualitatively. North and Jenkins (1951) operate with the vague notion of 'thought unit' along with punctuation. Graf and Torrey (1966) approach the question grammatically, however, as do Klare *et al* (1957) who attempt to set up a series of guidelines as to where line boundaries should come. They use three common rules for all their text samples:

- 1 existing punctuation should be followed;
- 2 never break a thought unit (*sic*) at the right-hand margin;

- 3 technical terms of more than one word are not to be broken.

In addition, a break is always permitted:

- 4 between Predicator and Object;
- 5 between loosely attached prepositional phrases; and sometimes (depending on the length of the unit):
- 6 between Subject and Predicator;
- 7 between Subject/Object single words and the adjoining structure;
- 8 between main and subordinate clauses.

In addition:

- 9 noun and verb modifiers, if short, go with the words they modify.

It is plain that these are only some of the significant possibilities. An ongoing project to produce some material for remedial readers at lower secondary level, in which I am involved, is attempting to come out with a more orderly and comprehensive set of guidelines (Crystal and Foster 1979), but to make it so, a more complete analysis in terms of grammatical levels is essential. In brief, at least the following distinctions must be recognized. Primacy is given to the notion of the *clause* within the *sentence*, and other grammatical notions are related to these. A sentence is viewed as an item in a sequence using sentence *connectors* of various kinds. Within the sentence, the notion of clause is analysed in terms of *elements* of structure (Subject, Verb, Object and Adverbial, in particular). The concept of *phrase* is important, in order to describe the various things that can happen grammatically within each element of clause structure. Phrases are seen as composite of *words*, and word-structure is handled in terms of *morphemes*. Within these terms, then, the working principle is that the line, as far as possible, should be coterminous with the clause. As this is the unit with which the prosodic system of the language most readily seems to correlate (see Crystal (1975), ch. 1), an interesting possible mutual reinforcement is suggested, in the case of reading aloud. Decisions about the placement

of line-endings are then made with reference to the types of subordinate clause, the complexity of elements of clause structure, and the complexity of phrase structure (particular reference here being made to the amount of pre- and post-modification such phrases contain). This series of decisions has some quite specific consequences, such as that a line should never end in a Determiner, or a preposition, and some interesting hypotheses about readability are generated, which we hope shortly to begin investigating experimentally. It is already plain, however, that studies of textual organization in relation to reading response must begin to consider systematically the interrelationships existing between grammar and the line; and in this area I do not doubt that linguistic analysis will be able to make a quite specific contribution.

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