

1987

The typographic contribution to language:

towards a model of typographic genres and their underlying structures

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A note about this edition

After completing my PhD thesis in 1987, I left the research career that had led up to it, and went into practice as an information designer, although some ideas from the thesis were published (Waller 1990, 1999). For the next twenty years, my main focus was commercial survival, and I gave it little thought until Judy Delin and John Bateman got in touch. Their AHRC-funded GeM project looked at the role of layout in written text, and took a genre-based approach. I was delighted when they used my model as a starting point for their own richer and more robust version (Allen, Bateman and Delin 1999, Delin, Bateman and Allen 2002).

At their suggestion I created a digital version, by converting the original WriteNow file into an early version of Word, and upwards through newer Word versions. The GeM project made this available online, but many illustrations were missing.

Recently I imported the Word file into InDesign, and I located and re-scanned most of the images. What you have here is the original text, although page numbers have inevitably changed, and I have also corrected a number of typos. One or two exemplar documents are not the originals but make the same points.

I am mindful that this thesis is over twenty-five years old and was written before the internet, and in the very early days of electronic documents and hypertext. And since 1987 much has been published on genre theory by scholars such as John Swales, Douglas Biber and Vijay Bhatia. I am also very aware of a huge deficiency in the thesis, because at the time of writing it I had not encountered Christopher Alexander's powerful concept of pattern language (Alexander, Ishikawa & Silverstein 1977). I am certain that this would have featured significantly in my discussion of how genre rules are articulated, and how functional imperatives evolve into genre conventions (Waller, Delin & Thomas 2012).

RW *January 2014.*

If you are interested in following up key citations of this thesis, I have added a supplementary bibliography at the end. I have added the original page numbers in red in the margin. RW *January 2020.*

Thesis submitted for the degree of
Doctor of Philosophy, Department
of Typography & Graphic
Communication, August 1987.

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This thesis presents a model that accounts for variations in typographic form in terms of four underlying sources of structure. The first three relate to the three parts of the writer-text-reader relationship: *topic structure*, representing the expressive intentions of the writer; *artefact structure*, resulting from the physical constraints of the medium; and *access structure*, anticipating the needs of the self-organized reader. Few texts exhibit such structures in pure form. Instead, they are evidenced in typographic *genres* – ordinary language categories such as ‘leaflet’, ‘magazine’, ‘manual’, and so on – which may be defined in terms of their normal (or historical) combination of topic, access and artefact structure.

The model attempts to articulate the tacit knowledge of expert practitioners, and to relate it to current multi-disciplinary approaches to discourse. Aspects of typography are tested against a range of ‘design features’ of language (eg, arbitrariness, segmentation and linearity). A dichotomy emerges between a linear model of written language in which a relatively discreet typography ‘scores’ or notates the reading process for compliant readers, and a diagrammatic typography in which some concept relations are mapped more or less directly on the page for access by self-directed readers. Typographically complex pages are seen as hybrid forms in which control over the syntagm (used here to mean the temporal sequence of linguistic events encountered by the reader) switches between the reader (in the case of more diagrammatic forms) and the writer (in the case of conventional prose). Typography is thus most easily accounted for in terms of reader-writer relations, with an added complication imposed by the physical nature of the text as artefact: line, column and page boundaries are mostly arbitrary in linear texts but often meaningful in diagrammatic ones.

Finishing a thesis is a cause for personal celebration, but until one has achieved a critical distance from one's own work it is hard to know how much it will please other people to be associated with it through an acknowledgement. I am happily not in the position of one writer, who would have liked to acknowledge his friends but no one helped him,¹ nor, at the other extreme, of another whose debt to a friend was so great that 'he alone is to be blamed for any shortcomings this book may have'.²

I owe an enormous debt to my supervisor Michael Twyman, to the late Ernest Hoch, also my supervisor at the time I started work on this project, and to colleagues at the Open University, especially Michael Macdonald-Ross, Peter Whalley, and the late Brian Lewis. I have knowingly and unknowingly absorbed an untold amount of information and insight from these colleagues over many years. One never knows whether ideas that seem original are actually half-remembered from conversations with others.

I would also like to thank David Hawkrige, Director of the Institute of Educational Technology, for giving me the time and encouragement to finish. Others whose encouragement and comments I have greatly valued include Pat Costigan-Eaves, Paul Stiff, Jane Wolfson, David Wolfson and Jenny Waller, who had to put up with the traditional eccentricities and bouts of despair of the thesis-writer.

RW August 1987

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¹ The preface to Jan V White's *Graphic idea notebook* (1980) reads 'It is customary to thank the people who have been helpful in the process of book-making, How I wish I could have palmed off some of the labors onto someone else! Alas...I was stuck with doing it all.'

² Talbot Taylor, *Linguistic theory and structural stylistics*, Pergamon Press, Oxford 1981.

A reasonable common-sense definition of typography with which to start might be ‘the visual attributes of written, and especially printed, language’. Like all appeals to commonsense, mine embodies certain assumptions, preoccupations and interests that will bias the way this enquiry develops.

For one thing, letterforms and layouts are not of interest to this study in a formal sense but only in so far as they exhibit that quality of *difference*, which is at the heart of language. Although at a certain level of analysis a spoken sentence may be said to be the same as its written equivalent, it is never exactly the same in substance or effect. It has been diminished in some respect, but it has also been enhanced: writing has only a crude and unreliable version of vocal pitch, gesture and tone, but it can contribute spatial organization and graphic emphasis. Through the technology used to write, whether a biro or a computer display, written language gives its own particular clues about its origin. It is typography that has both diminished and enhanced the subtlety of the message.

There are other visual attributes of written language that have no spoken equivalent: a table, for example, contains the potential for a large number of interactions between row and column headings. A skilled reader of tables can perceive patterns in the data such as would be impossible should the information be read out aloud – in the case of a large table, a long and tedious process. In the case of the table, a fairly simple graphic system, the interface between verbal and visual language has already become blurred, and it becomes more so when we consider diagrams and diagram-like typographic layouts.

To those deeply involved with the teaching or practice of typography, such things as creativity, meaning, quality, and style are easier to exemplify than to explain. But to those outside, in so far as they are aware of them at all, such aspects of typography are something of a mystery. Engineers designing text display systems, psychologists studying the reading process, and even those researching into legibility and other typographic issues, often seem unaware of the role of typographic subtleties. There is no obvious conceptual framework within which typography can be discussed in this public domain, within which logical ties can be clearly seen between its aims, methods and effects.

‘Conceptual framework’ is a term we tend to use rather loosely to allude to something we want people to think is rather precise. In concrete terms it may be realized in a range of scholarly formats. It may be a taxonomy, which identifies the most relevant dimensions of an issue and arranges the

data accordingly; these dimensions may be abstract aspects of typography or they may be examples of typography in practice. A conceptual framework may be a set of rules thought to govern the behaviour of such components, which can be tested empirically – in the natural sciences these may be laws or theorems; in linguistic terms they may be grammars. It may consist of theoretical models such as those constructed by cognitive psychologists to explain the ‘mechanisms of the mind’. Less formal explanations such as metaphors or analogies can act as organizing principles to direct our thinking about a field of study. Less formally still, slogans and catchphrases (‘form is function’, ‘the medium is the message’) can also have a unifying and directive effect. The imprecision of the term ‘conceptual framework’ may be helpful at this stage: it allows us to refer to something we have not yet constructed or even specified, without predetermining its status.

Many practical activities get by perfectly well without any articulated conceptual framework. Is typography any different from, say, plumbing or car maintenance, that in addition to a range of practical techniques and strategies there should be an underpinning intellectual system? In the context of literary theory, Eagleton (1983: 198) remarks that

‘Many literary critics dislike the whole idea of method and prefer to work by glimmers and hunches, intuitions and sudden perceptions. It is perhaps fortunate that this way of proceeding has not yet infiltrated medicine or aeronautical engineering.’

No one has died from a poorly constructed novel, we may hope, and we hear of few accidents involving poems, but bad typography actually can have quite serious consequences – for example, if instructions or signs are ambiguous. Typographers have their own response to anti-intellectualism in this apt, if somewhat condescending, remark from Stanley Morison’s preface to the second edition (1951) of *First principles of typography*:

‘The act of organizing a piece of printing so that its correct presentation may be achieved requires, in the first instance, a sense of method. To be valid this method must conform to right observation, thinking and reasoning. All men are able to think, but not everyone is willing to train and exercise that faculty. The process of thinking is, in fact, often so painful that many prefer to ignore this essential means to the right solution to the problem.’ (p. 22).

Morison probably overestimates the ability of traditional articulated reasoning to cope with multi-faceted problems: the apparently unthinking reliance of craftsmen and women on aesthetic judgements about ‘balance’ and the like may actually represent the only way of expressing a kind of reasoning that, being so complex, is impossible, or simply tedious, to express in language.³

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³ This issue is taken up in more detail in Chapter 2.

Nevertheless, it is one aim of this study, at the outset at least, to try to suggest a framework within which typography can be discussed and criticized – but in reasonably everyday terms without the need to dress one’s thoughts in the full regalia of semiological classification schemes. Several broad arguments for the development of a conceptual framework may be suggested:⁴

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Typographic education: as it is usually taught at present, typography primarily involves visual judgement, manual dexterity and holistic problem-solving ability. These practical skills are taught experientially through project work, criticism and apprenticeship. But it is also a facet of literacy, being concerned with the use and interpretation of language. Those practising it should be literate people skilled in the handling of ideas. Editors, who also fulfil a mediating role in the publishing process, are recruited from the graduates of mainstream university disciplines and given a minimal training. The manual and visual skills required of typographers, though, are too great for the same system to work: their intellectual training must therefore grow out of their practical training. It can be additionally argued that typographic education needs a sounder conceptual base in order to counteract the strong gravitational pull of the more glamorous parts of the graphic design world, which many design students aspire to but few are destined to enter. It should also enable designers to adapt the specific skills they learn at college to new technologies as they emerge.

Typographic research: typography has frequently been shown in experiments to affect the legibility and understanding of texts. But for research to show exactly *how* this happens – for hypotheses to be generated and tested – a coordinating framework is needed. There is also a general cynicism among practising designers about the worth of such results: partly because given the lack of a conceptual framework it is hard to generalize from the ‘laboratory’ to the real world, and partly because their own working method is more instinctive than cerebral.

Design management: although the word ‘design’ describes every aspect of the planning of a product, the word (and the process it refers to) has eluded easy definition. While typography might be said to be present in all written texts, whether produced by people termed ‘typographers’ or not, it frequently forms one element of a production process that takes place in an institutional environment. Like any other aspect of institutional life, it must be managed: scheduled, fitted into other processes, explained, or in some other way articulated. Creativity is regarded as difficult to coordinate within

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 4 Many of these points were first raised by the Working Party on Typographic Teaching (set up by the Society of Industrial Artists and Designers and the Society of Typographic Designers) in their 1968 interim report, a version of which was published in the *Journal of Typographic Research* (since renamed *Visible Language*), 1969, volume 3, 91–102.

an industrial process. The unfortunate reputation designers have acquired is highlighted by a recent advertisement for a computer graphics product which promised ‘a complete studio at your fingertips – with no delays, no tantrums, no egos’.⁵ One of the problems may be that designers and their clients lack a common language.

The de-skilling of printing: the production of typographic displays is no longer in the hands of a few trained specialists, but available to all. Technologies that were once complex – typesetting, offset litho, video and computer displays – are now standard office or even domestic equipment. Our concept of literacy should be extended to include a wider range of communication skills, including typography.

The design of communication technologies: the fast growth of the new communication technologies is involving numerous engineers and software designers in the design of typographic features and capabilities. Typographers are often brought in, if at all, only after important decisions have been taken. For example, Twyman (1982) reports the initial assumption that only upper case would be necessary on videotex systems. A conceptual framework might help typographers communicate with systems engineers, and would make typographic concepts accessible to engineers who do not have typographers at hand to consult.

Discourse studies: As will emerge from this study, neighbouring disciplines such as linguistics, bibliography and cognitive psychology are starting to notice more aspects of typography as they converge on the context-sensitive fields of reader-relations and discourse studies. Typographic scholars can usefully contribute to this process.

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The linguist FW Householder made a half-serious but useful distinction between ‘hocus-pocus’ and ‘God’s truth’ theories. This study is unashamedly of the former kind: it does not claim to discover the ‘real’ nature of typographic phenomena, but suggests structures that may be usefully applied for the sorts of practical purposes discussed above.

I am painfully aware of the dangers of multi-disciplinary study and my foolishness in attempting it. I have tried to steer a course between the naïve positivism of pop psychology and the exaggerated relativism of what Lakoff & Johnson (1980a) call ‘café phenomenology’. And although I have sometimes referred to historical examples, I have tried to bear in mind Eisenstein’s (1979) warning that ‘where historians are prone to be over-cautious, others are encouraged to be over-bold’ (p. 39).⁶ I have

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⁵ The quotation is from an advertisement for the ‘Sweet P’ graph plotter which appeared in *Byte* magazine for several months during 1984. Computer users will smile wryly at the implication that computers display none of these characteristics.

⁶ However, my reading of Eisenstein herself, and others too, leaves me with the impression that many historians of this subject are not particularly reticent about identifying turning points in civilization – in

therefore tried to keep a respectful distance, referring to history only in so far as the published conclusions of major writers throw light on current practice through precedent or analogy.

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evolution, even: candidates include writing itself (Gelb 1963), alphabetic writing (Havelock 1976), word separation (Saenger 1982), printing (Eisenstein) and engraving (Ivins 1953).

1

Typography and language: a selective literature review

In this chapter I shall review some of the typographic literature to give an impression of the ‘story so far’. The review is necessarily selective, and leaves out a great deal of valid and useful information about particular typographic problems. The purpose is not to list all that is known, but rather to sketch a background to the theoretical problems addressed in this study. By ‘typographic literature’ I mean writings that have explicitly set out to discuss some aspect of typography, rather than writings on other topics that might conceivably be relevant to typography (although I introduce quite a number of these in later chapters).

It is appropriate to start by looking at what typographers themselves have written, before considering the approaches taken by those psychologists and linguists who have addressed typographic issues.

Typographers on typography

British typography is still heavily influenced by ‘the great and the good’ book typographers of the Anglo-American pre-war tradition, (for example Rogers 1943, Morison 1951, and Updike 1937). While they contributed a great deal of intelligent and scholarly writing on typography, it was mostly of a historical or technical rather than a theoretical character. Above all, they were concerned with the revival and creation of beautiful and effective letterforms, and with the design of readable prose, mainly for books but also newspapers. We should remember that the concept of ‘typography’ as an abstract entity was relatively new, as was the profession of ‘typographer’.

On the written evidence, it seems that they did not view typography as part of language so much as a channel for its transmission. Beatrice Warde’s ‘crystal goblet’ metaphor (1955) encapsulates the idea of typography as a transparent vessel adding no colour of its own to the author’s meaning.⁷ In order that typography could be completely natural and unobtrusive, letterforms must be perfectly formed and free from mannerisms, lines and columns of type must be arranged to carry the eye smoothly along free from distraction or fatigue. This ideal was not original: the best printers have always been conscious of their responsibility as a channel for clear

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⁷ Models and metaphors for communication are discussed further in Chapter 5.

communication. Perhaps no one has expressed the ideal better than Joseph Moxon (1683/1962: 211):

‘A good *Compositer* is ambitious as well to make the meaning of his *Author* intelligent to the *Reader*, as to make his Work shew graceful to the Eye, and pleasant in Reading.’

While we do not normally associate this school of typography with ‘functionalism’, the crystal goblet tradition established two valuable characteristics in the evolution of today’s ‘information designers’. Firstly, the designer’s role is, on the whole, seen as a facilitative one in which the function of the book as a channel of communication between the author and reader takes priority over its status as an art-object or as a monument to its designer.

Secondly, the traditionalists exhibited a finely-tuned sense of appropriateness – alongside legibility, they have a concern for what typographic researchers were later to call ‘atmosphere value’. Works of literature, in particular, were best set in a typeface of their period, and conversely ‘If the subject matter be of a serious or scientific nature the severest style is the most suitable’ (Rogers 1943). And because he recognized a distinctive ‘eye-catching’ function for publicity material, Stanley Morison was prepared to break all of the normal rules of elegant typography in his Gollancz book jackets and other items intended to catch the eye (cf Morison 1928).

Taken literally, pure crystal-goblet typography might lead us to find a ‘correct’ way of arranging type and stick to it, whatever the task in hand – just as some typographers of the Swiss school (discussed below) might use only a single sans serif throughout their careers. ‘Correct’ might mean the most ergonomically effective type, or the type most consistent with the ‘spirit of the age’. Indeed, this was usually the case for the first four hundred years of printing, when at any one place and time there was a strictly limited range of ‘normal’ typefaces available to individual printers. Although taken for granted by present-day typographers, it is largely a nineteenth and twentieth century opportunity to select the most appropriate typeface from a range with different historical or expressive associations. The idea that typography should be in harmony with the genre of the text was a distinctive concern of these printers and typographers.

Bruce Rogers (1943: 22) expressed it this way:

‘Making an “allusive” format for a book – that is, casting it in the style of the period of the original text – is in a small way something like planning the stage setting for a play. An up-to-date style for an ancient text would compare with staging *Hamlet* in modern dress. However novel and effective in its own way, you feel it to be strange, and this sense of strangeness is an annoying distraction; you are forced to think of the setting and the designer rather than of the text.’

While this might be disputed (it is arguable that modern dress, or modern (small ‘m’) typography, is more neutral and so less distracting than ‘fancy dress’) the metaphor is an interesting albeit an old one.⁸ Rogers does not elaborate it, but it bears extension: while the script and plot are provided by the author, who can also control the movement of arguments from background to foreground and from one episode to another, typography can contribute the costumes (letterforms, ornaments, symbols, rules, etc) and the set (the format, layout or grid); typography may also announce or signal the progression of the plot. It is interesting to see that the ‘staging’ metaphor has recently surfaced in the literature of discourse analysis (Grimes 1975; Clements 1979) to describe the ways in which speakers and writers use linguistic signalling to ‘place’ parts of a narrative in the foreground or background.

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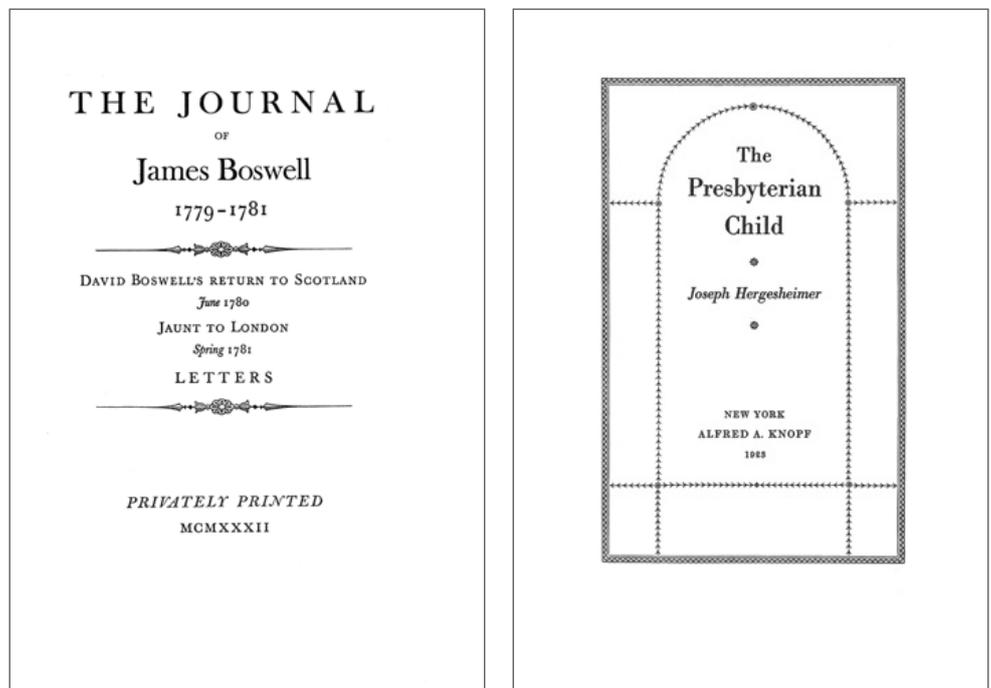


Figure 1.1 Two ‘allusive’ Bruce Rogers title pages, both reproduced in *Paragraphs on printing* (Rogers 1943). Neither the dimensions nor the margins of the originals are indicated, but they are much reduced in size.

To inject a personal note: although this interpretation seems to allow the typographer considerable scope for making a creative contribution to the texts for which he or she is responsible, it represents, in part, my own attempt to be positive about a school of typography that I find somewhat prefectorial. Morison, in his last work, *Politics and script* (1972), sees typographic style in terms of the conferring of authority on a work. Most of the book is an intricate intertwining of church and typographic history of a fairly obscure kind, but it concludes with Morison’s view that there is a:

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⁸ The metaphor of language as the dress of thought can be found in Quintilian (Book VIII, introduction, 20).

‘universal consensus upon the principles that should govern the shapes and uses of the Graeco-Roman alphabet in all works addressed to the intelligence of mankind.’ (p. 339)

The modern guardians of this consensus, which Morison saw as the culmination of ‘a twenty-five-century evolution...under the authority of emperors, popes, and patriarchs or abbots or masters of guilds’ are the university presses. The consensus is said to be

‘a reconciliation of authority and freedom...which is the best guarantee against experiment or innovation or irresponsibility. By irresponsibility is meant any reduction in the authority proper to the style of permanent literature addressed to the intelligence of man in favour of the freedom proper to ephemeral matter addressed to the emotions of man.’ (p. 339)

This exaggerated divide between intelligence and emotion, authority and freedom may not be representative of anyone’s view other than Morison’s, but it may nevertheless be symptomatic of what Moran (1978: 14) calls ‘... an odd world, full of caste and class sympathies’. The context of this remark is a discussion of the obvious bitterness that marred the relationship of the Double Crown Club (a select, and male only, dining-club of leading book typographers) and the largely advertising-oriented British Typographers Guild.

Quite apart from the risk of excommunication by popes or patriarchs, it is hard for those trained in this tradition to summon up the courage to be critical, such is the standard of detailed technical know-how represented by such as Williamson (1966), and Simon (1945), whose treatment of drama, poetry and indexes demonstrates immensely good sense and a considerable virtuosity in the setting of complex matter. However, the problem remains that standards are mainly passed on in the form of examples to imitate rather than principles that are adaptable to different technical circumstances or texts other than novels and poems. And while scholars and designers of the historical tradition discuss the display of fine literature for continuous reading in by no means unfunctional terms, they are less reliable when away from their home ground.

At the end of MH Black's (1961) detailed account of sixteenth-century developments in Bible printing (by Robert Estienne and his contemporaries), he effectively accuses Bruce Rogers of placing visual form before function in his 'allusive' approach.¹¹ The printers described by Black, Estienne in particular, did set visual standards that are worth reviving, but their functional innovations are equally significant. These included chapter headings, summaries, running heads and versification (see also Black, 1963).¹²

The age of Morison was one in which typographic opinion-leaders were considerably more literate, culturally aware and prominent on the intellectual scene than had previously been the case (or has been since, probably). But although conscious of the central cultural role of printing and typography, the fuller implications of that role are often missed. For example, although Beatrice Warde wrote eloquently of the 'three great privileges' of printing in her foreword to Steinberg's *Five hundred years of printing* (1974) – they are, essentially, the privileges to turn back, to look forward, and to stop and think – it is not made clear that typography and layout might be deployed so as to support such activities.¹³

Modern typography

It is usual to contrast this historically inspired, symmetrical style with the asymmetry of 'modern typography' (variously called New, Asymmetric, Functionalist, International or Modern Typography), whose origins go back to the Bauhaus and earlier. However, both movements have similar motivations: to reform the allegedly 'enfeebled' typography of the nineteenth century. Tschichold (1935/1967), who was responsible for the fullest exposition of the principles of the New Typography, summarized the different approaches when, after praising William Morris, he said

'He was right...to go back to the incunabula but wrong in copying their externals instead of their spirit. They were in their own day a step forward, a bold seizing of

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perceptively and at some length about book design (using title-pages rather than text pages as illustrations), McLean's discussion of 'jobbing printing', a rather archaic and dismissive term, is extremely short and includes a before-and-after exercise in table design in which the after is more elegant but rather less effective than the before.

¹¹ Black's comment reads: 'The Doves is unreadable, and is plainly a piece of fifteenth-century revivalism based on a confused analysis. Bruce Rogers is impressive, but this article will have sufficiently indicated where most of his ideas came from – Estienne. Could it be that a twentieth-century printer might be moved by such examples to provide a worthy competitor that paid the necessary respect to tradition without dwindling into eclecticism and pastiche?' (p. 203)

¹² Twyman (1986: 189) comments that 'oddly enough, specialist historians, whom we might expect to have been interested in the development of graphic configurations have, almost without exception, shunned approaches that deal with their specialty in functional terms as a branch of graphic language'.

¹³ Morison (1936: 1) talks similarly of 'the inherent courtesy of print: that it can be skipped or skimmed ...'.

new opportunities. Morris's copying of them was a backward step...a shirking of reality.' (p. 16)

In the usual 'fog in channel – continent isolated' manner, there appears to have been considerable ignorance in Britain about the graphic arts revolution happening in Europe. Modern typography harnessed the visual idioms of new art movements (Futurism, de Stijl, Dada, Constructivism) to printing, using visual tension, contrast and rhythm to manipulate the reader's attention. Laszlo Moholy-Nagy, a major figure in the New Typography and a teacher at the Bauhaus, explained the method thus:

'In contrast to the centuries-old static-concentric equilibrium, one seeks today to produce a dynamic-eccentric equilibrium. In the first case the typographical object is captured at a glance, with all the centrally focused elements – including the peripheral ones; in the second case, the eye is led step by step from point to point, whereby [the awareness of] the mutual relationships of the individual elements must not suffer.' (Quoted by Kostelanetz, 1970: 80)



Figure 1.3 Herbert Bayer's 1925 design for a catalogue of Bauhaus products (from Spencer, 1969a). Original 210mm x 296mm.

While the 'crystal goblet' idea relies entirely on the author to make his or her meaning clear, modern typography was thus prepared to offer the reader additional support. In Tschichold's words,

'modern man must read quickly and exactly. Every effort must be directed to transferring the words smoothly to the reader. This can be achieved by correct groupings to express the sense of the words' (p 46).

Display type was bold and large, text type was clear and simple (often sans serif), the ‘bullet’ was introduced, thick rules abounded, and ‘white space’ was used to group information. Such features, startlingly new and even shocking at the time, have become absorbed into the general typographic repertoire.

In their day, such devices made considerable demands on printers and their equipment: from the technical point of view, functionalist typography was often rather less functional than the style it replaced. Instead, the ‘functional’ label (originally, at least) indicated a concern for typography which articulated the meaning or structure of the information, and which made the printed document function better for the reader.

This functional concern is expressed nowhere better than by Tschichold (1935/1967). For example, sans serif type was preferred by more formalist designers because it lacks extraneous or decorative embellishments, but by Tschichold because ‘its wide range of weights (light, medium, bold, extra bold, italic) gives every colour in the black-and-white scale’. And while others are nervous about indented paragraphs because they spoil the neat blocking of information and strict alignment of everything to the margin, Tschichold thinks the issue through from the reader’s viewpoint. He points out that when the last line of a paragraph is a full one, the start of the next paragraph is hard to see; even if line spaces are used, the reader is confused when they fall at the page break.¹⁴

Like other writings by busy practising typographers, *Asymmetric typography* is an uneven mixture of substantial argument and brusquely delivered, though immensely sound, rules, and of concern for both functional and technical excellence as well as beauty. But although he has much to say about the clarity of information as a criterion for good design, elsewhere Tschichold wrote:

‘We must ask ourselves...whether the result is *pleasing*, whether we have achieved a balance. Provided the work is all right technically, there is no other criterion for typographical design.’ (Tschichold 1934/1975: 124)

In this two-fold standard of technical and aesthetic excellence, the information structuring function seems to have been lost. In the absence of a critical tradition, it is easy for typographers to lose sight of the needs and reactions of distant readers and concentrate on the problems that lie close at hand: the technical problems of the printing process, and their aesthetic problems as visual artists. This certainly seems to have been the way that the functionalist ideal developed among the ‘Swiss School’ of

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¹⁴ Interestingly, a similar point is made by De Vinne (1901:193), who refers to ‘a new school of typography [which] disapproves of the old-fashioned method of indenting paragraphs’. In the layout of this thesis I have set the paragraphs full out in order to reserve the use of indentation for the considerable number of quotations. An alternative strategy might have been to reduce the type size of the latter, but this would have been time-consuming and might have had the effect of diminishing their status.

typographers who emerged in the 1950s as the most thorough exponents of the modern typography. For example, in their textbook *Basic typography*, Ruëgg and Fröhlich (1972) divide their attention between technical matters (typesetting systems, for example) and aesthetic aspects of visual form (contrast, proportion, rhythm, colour etc).

Emil Ruder's *Typography* (1967; see also the review by Kinross 1984) provides further examples of this aesthetic revisionism. While warning of the 'standing temptation for the typographer to use his type primarily as a tone of grey and thus to allot it a purely aesthetic and decorative role', in another chapter we find him asking:

'What is the relationship between the colour value and quality and the grey of the type matter? How do the various tones of grey compare? The proper observation of these principles is crucial for the beauty of a printed work, and for its formal and functional qualities.'

Functional Swiss typography of the most tightly-argued and informed kind is represented by Karl Gerstner (1959, 1974). His concept of 'integral typography' reaffirms the ideals of Tschichold:

'a marriage of language and type resulting in a new unity, a superior whole. Text and typography are not so much two consecutive processes on different levels as interpenetrating elements.' (Gerstner 1959: 66)

Gerstner's *Compendium for literates* (1974) represents an attempt to make the connection, and it is something of a tour de force of systematic analysis. Indeed, it is so systematic that where most of us would be content to list the theoretical possibilities of writing as 'embossed', 'punched out' and so on, Gerstner's printer is obliged to actually emboss and punch out examples. Among the rather tedious but magnificently thorough exemplification (large writing, small writing, upside-down writing, black writing, white writing... and so on) are well chosen references to major figures in other disciplines – including linguistics and psychology – and a systematic view of the expressive properties of type.

Gerstner's *Compendium* deals mostly with the display of words and sentences, but perhaps the most influential and lasting contribution of Swiss typography is the grid system of page layout. From the earliest days, most books have been designed with standard text areas and margins – simple grids. But Swiss typographers, responding to the needs of technical and information publishing in a multi-lingual country, developed the grid as a system for complex multi-column page layout. Their distinctive contribution was not the multi-column layout, also common in medieval manuscripts and modern newspapers, but the addition of horizontal grid lines, resulting in a modular layout system. The immediate practical problem this solved was the parallel display of different languages. The three main languages of Switzerland (German, French and Italian) could hang side by side from

a horizontal line; although of different lengths the alignment could be restored at the next heading down (Figure 1.4). Such pages have some of the characteristics of tables.

The grid system was also found useful for the design of illustrated books and magazines, whether multi-lingual or not. Its modularity restricted the number of possible column widths and simplified the specification of type. More controversially, though, grids were found to solve aesthetic 'problems'. By following the modular principle, a visual unity could be imposed on complex material. Illustrations could be restricted to certain shapes; tiresome bits and pieces, such as folios, captions, headings and even paragraph indention, could be aligned on the grid. Eventually the grid achieved a cult status, which it still enjoys in some circles.

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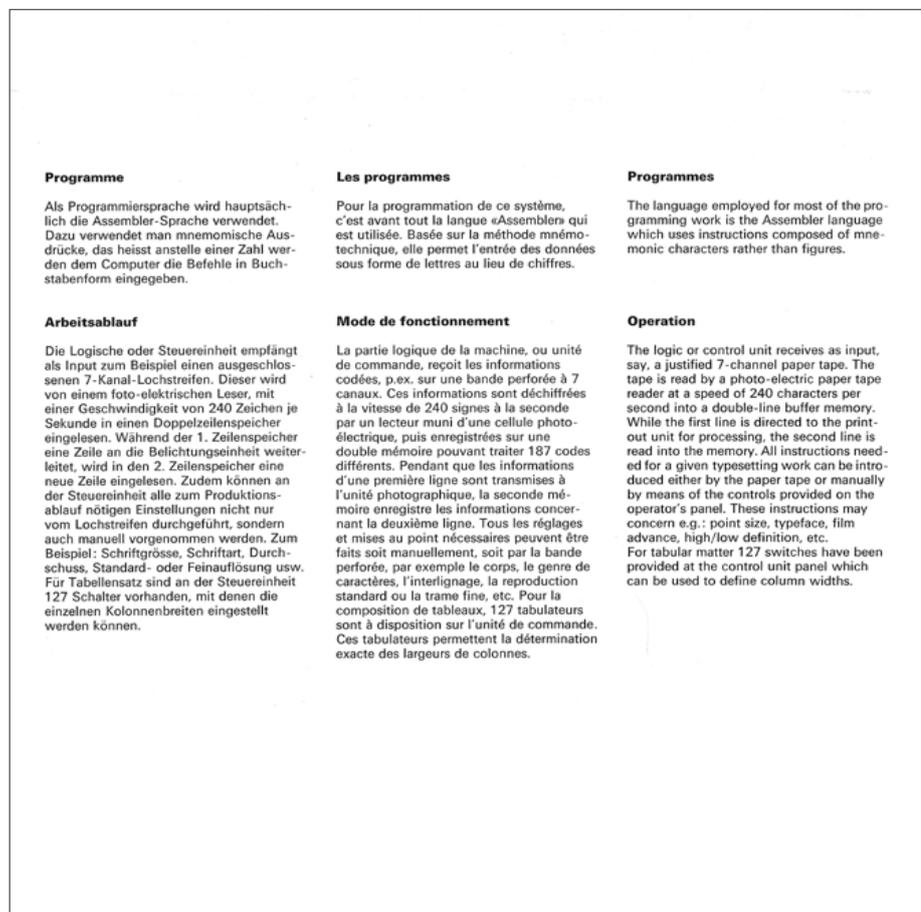


Figure 1.4 A typical three-language, three-column page for which the Swiss grid system is ideal. Source: Rüegg & Fröhlich 1972. Dimensions: 250mm x 250mm.

An example of the degree to which good design was equated with adherence to the inviolate grid can be identified in a paper by Bonsiepe (1968). He proposed an index of the orderliness of a page, analogous to those used to predict the readability of prose. The main measures were to be the numbers of horizontal and vertical points at which components

were aligned. But whereas readability formulas are routinely subjected to extremely thorough empirical testing, in which the index scores are related to the performance or preferences of users,¹⁵ the grid principle seems to have been so self-evidently right that Bonsiepe apparently saw no need to justify his proposal further.

Bonsiepe's mistake is to confuse orderliness with tidiness. I discovered the difference as a child. If my clothes and toys were scattered around the bedroom they could be located easily but the room was deemed to be untidy. On the other hand, if they were stuffed into drawers or arranged in straight lines, the room passed my mother's inspection but I could never find anything. In effect, Bonsiepe is insisting that all the information on a page is fitted into equal size boxes.

This high value placed on visual tidiness is symptomatic of a more general minimalism, in which simplicity of materials and form is valued for its own sake. At its best it can result in sober typography of the highest integrity, but its adherents sometimes make the mistake of assuming that all typographic contributions to a text are content-free adornments.¹⁶ In the wrong hands, grid typography tempts designers to seek visual alignments wherever possible, regardless of a real connection existing between the things aligned. When coupled with a minimalist style that restricts the number of type variations, grids have sometimes resulted in extremely cryptic layouts that are hard work to interpret. The problem is that by the time the reader encounters the page, the designer's grid has disappeared. The reader must impute imaginary grid lines to the page and use them to make decisions about the relationships intended by the designer.

In spite of such problems – and every system can be abused – grid typography is too important to dismiss. It has become absorbed into every designer's working methods and so must be an essential part of any systematic overview of typography. It should also be said that most typographers qualify their advocacy of grids carefully (eg Hurlburt 1978).

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¹⁵ Although subject to recent criticism, and consequently somewhat out of fashion now, readability formulas can still provide a reasonably accurate index of the difficulty of prose, but can neither pinpoint specific problems nor be used as a prescriptive guide for writers. Klare (1984) has recently published a comprehensive and intelligent account of their history, use and current status.

¹⁶ Minimalism is not the exclusive preserve of the New Typography. The American printer Theodore De Vinne (1901) appears to have thought the printer's job would be much simpler if authors could rely on words alone: 'The desire to make written language clear to the reader is to be respected, but some of the methods now in general use are unsatisfactory and will not stand critical examination. A hundred years ago it was the duty of the printer to begin every noun with a capital letter and to compose in italic every word that needed or seemed to need emphasis. It was hoped that capitals and italic would help the reader to a better comprehension of the subject ... Experience has proved that readers do not need these crutches, and that ordinary matter can be made readable and intelligible without them. It is probable that the next generation will put greater restrictions on the use of quotation-marks...'

This evolutionary view that readers can learn to handle ever simpler arrangements, which anticipates the attempted lower-case-only alphabet reform of the Bauhaus school (Spencer 1969a,1969b), is also reflected in De Vinne's discussion of hyphenation (see Chapter 7).

Moreover, it is a thoroughly two-dimensional and typographic idea which is impossible to integrate in a theoretical framework derived only from a (linear) linguistic model. Grids are discussed further in Chapter 7 where they are seen in the context of other ‘artefact structures’ in text.

In summary, I have briefly introduced three related but distinct strands among twentieth-century typographic writers: related in their effort to identify a role for the professional designer and establish high standards for the design of printed matter; distinct in their systems of visual logic. Stripped of their various aesthetic dogmas, all three seem to make good sense as constituents of a typographic criticism. The historical revival contributes a sensitivity to genre, the New Typography introduces an enlarged repertoire of graphic techniques with which to display the structure of a message, and Swiss typography contributes the grid system and its emphasis on the flexible and ordered page.

It is not a realistic or desirable aim for a typographic theory, in the manner of spelling reformers, to seek to replace existing standards with some revolutionary new system that claims to be uniquely rational.¹⁷ Instead, the model that will be presented in Chapter 5, together with the discussion of typographic genres in Chapter 9, can be seen as an articulation of the eclectic blend of these three schools of typography that characterizes current practice.

Gestalt theory

Many of the techniques of the New Typography (and subsequently the Swiss school) owe something to the contemporary Gestalt psychologists, who were working in Germany in the 1920s and 1930s (for example, Koffka 1935). Although the connection may not be always explicitly declared (at least in those publications most easily available in the English language) the influence is undoubtedly there. Gerstner, for example, does not cite Gestalt psychology in his *Compendium for literates*, although he frequently uses Gestaltist terms, like closure, figure and ground. Rivlin (1987), who has recently published a detailed application of Gestalt principles to typography, appears to have found few prior publications making the explicit connection.

Gestalt theory is best summed up by the catch-phrase often associated with it: ‘the whole is greater than the sum of its parts’. Gestalt psychologists identified a range of principles which together provide evidence of an overall Law of Prägnanz, which, to avoid the theoretical commitment implied by that term, we might call the simplicity principle. It is a natural instance of Occam’s razor: if several alternative structures are possible, the

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¹⁷ As Venezky (1970) has shown, English spelling is considerably more rational than is usually thought.

simplest and most stable will be selected. Figures 1.5 to 1.7 illustrate the three principles most relevant to typography.

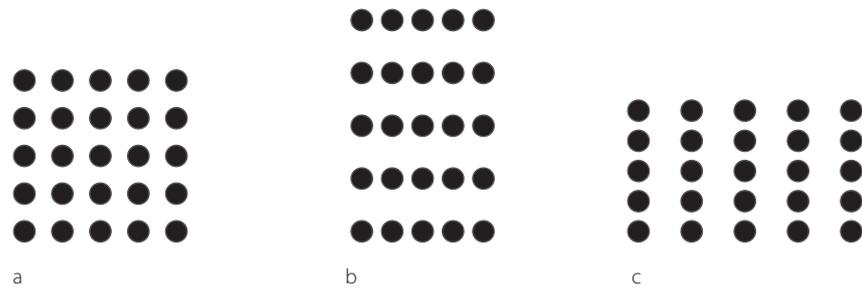


Figure 1.5 Grouping by proximity

Proximity: Things which are close together are seen as groups. While we see Figure 1.5a as a matrix of equally spaced dots, Figures 1.5b and 1.5c are visually organised into rows and columns. When typographers use space to group components, they employ the proximity principle.



Figure 1.6 Grouping by similarity



Figure 1.7 The closure principle:
it is possible to see this as a square

Similarity: In Figure 1.6, it is the similarity of elements that creates the grouping, not the use of space. When typographers use a consistent typeface to signal a particular kind of, say, heading, they are grouping by similarity.

Closure: Figure 1.7 demonstrates the tendency to ‘close’ gaps between graphic elements and see stable shapes wherever possible. Typographic grids are based on the closure principle, together with the similar ‘good continuation’ principle.

The Gestaltists’ observations and demonstrations of how we perceive visual structure are too compelling for easy denial but not easily explained psychologically; their explanation that perceptual principles correspond to in-built ‘brain field forces’ has given way to more verifiable cognitive explanations (Marr 1982).¹⁸ The basic principles of Gestalt psychology – or, at least, the observations on which they are based – have become absorbed into the art school curriculum and, now largely divorced from

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¹⁸ Marr’s explanation is that the Gestalt illusions correspond to characteristics of normal physical objects and thus they are learned, not innate: many natural objects are symmetrical, have smooth contours, contrast in various ways with their background and so on. Bruce and Green (1985) provide an up-to-date review of current perceptual theory.

their theoretical origins, form a basic part of the designer’s craft knowledge. They might be seen as relatively inflexible perceptual rules that act as a fundamental constraint for the typographer alongside such conventional rules as the left-to-right direction of the writing system.¹⁹

Figure 1.8 illustrates some gestalt problems in an illustrated book.²⁰

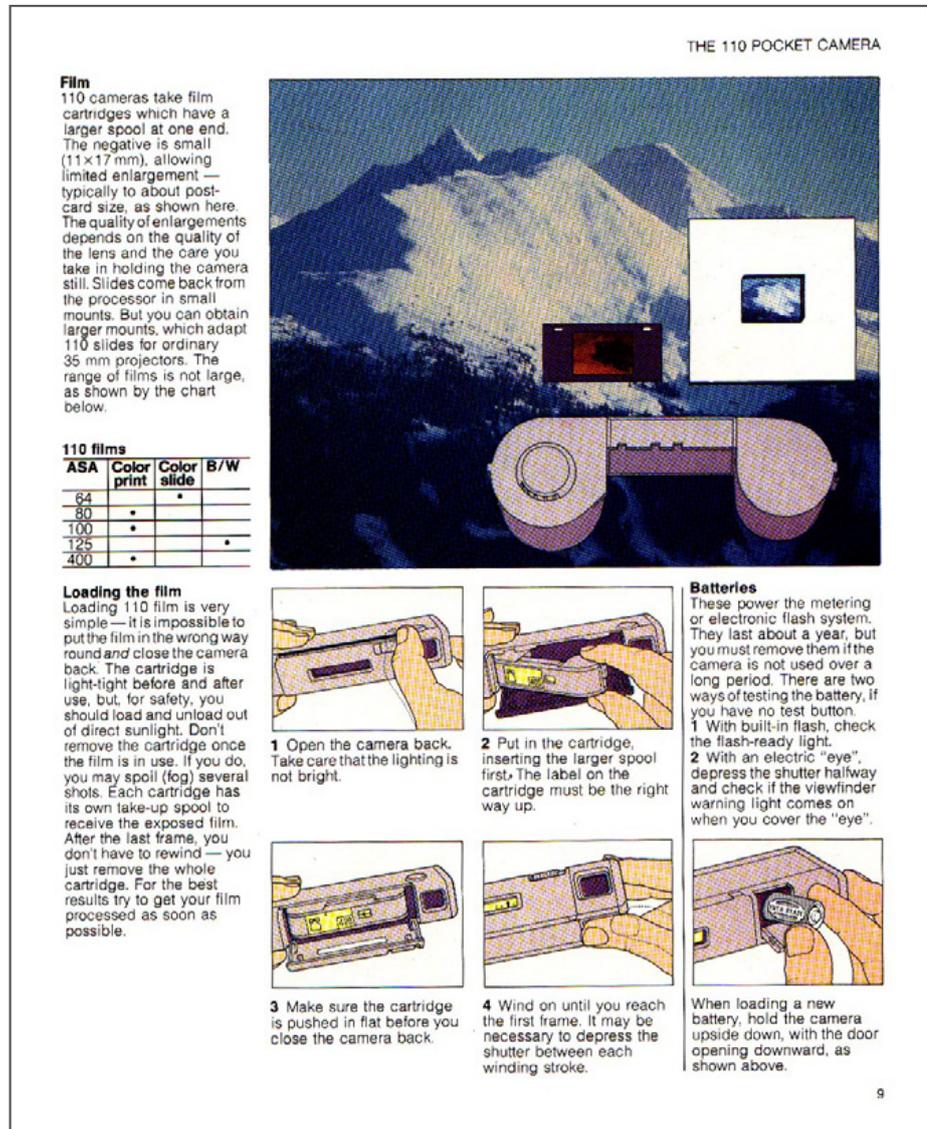


Figure 1.8 This page from *The pocket camera handbook* by Michael Langford (Ebury Press) shows some of the perceptual rules that typographers must anticipate. For example, because the small illustration at the bottom right ('Batteries') has been aligned with stages 3 and 4 of 'Loading the film', we tend to see it as part of the same sequence (proximity/good continuation principles). The vertical rule between is too weak to counteract the effect.

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¹⁹ Rivlin (1987) has argued cogently for a central role for Gestalt principles in typographic theory, but he may be pushing on an open door – the standard Gestalt demonstrations are too convincing to deny, and applications to typography are not hard to identify. The real problem, surely, is to relate these two-dimensional graphic phenomena to language and communication.

²⁰ Hereafter I shall use an anglicized version of the word 'gestalt'. Thus it is not capitalized and the plural is 'gestalts'.

Applied psychologists and typographic research

Over the years a great many studies have been published by psychologists (of various specialisms) who have examined the effect of typography on readers. Educational theorists (for example, Rowntree 1982) traditionally divide the outcomes of education into three ‘domains’: the psycho-motor (physical skills), the affective (aesthetic and moral appreciation) and the cognitive (intellectual skills). The distinction provides a convenient framework for discussing the applied psychology of typography. Literacy involves the attainment of skills in all three domains, and all three have been addressed by typographic researchers using the methodologies of applied psychology.

Legibility: the psycho-motor domain

Early typographic research (reviewed by Pyke 1926) was closely integrated with the more general investigation of the reading process. While Pyke lists instances of eighteenth- and early nineteenth-century work (eg, by Babbage in 1827), Javal (1878) is generally credited as the first to apply the scientific method to typography, and a considerable number of studies of ‘reading hygiene’, as the field was then called, were published in the first half of this century. The typographic variables listed by Legros (1922) typify the scope of much of the legibility research that still appears from time to time today (Table 1.1).

Size of character
Thickness of strokes
White space between strokes
Dissimilarity of characters
Leading
Line length
Frequency of kerns
Similarity of figures
Width of figures
Separation of lines from adjacent matter
Unnecessary marks in or near characters
Vulgar fractions
Variations in type height
Quality of paper
Colour of paper
Light-reflectance of paper
Colour of ink
Illumination
Irradiation

Table 1.1. Typographic variables listed by Legros (1922).

It is interesting that typography was regarded as just one contribution to reading hygiene, alongside such things as lighting, paper colour, reflectance, the angle and curvature of the page and even posture. With the introduction of electronic displays, similar factors have again become the focus of research attention.

The most prolific legibility researcher was Miles Tinker of the University of Minnesota, who with his colleague Donald Paterson²¹ published several dozen legibility experiments between 1929 and the publication of his books *The legibility of print* (1963) and *Bases for effective reading* (1965), now standard sources. Reactions to Tinker differ, generally between those with practical experience in printing or typography and those without. Among the latter, Tinker's research is still widely cited.

A number of general criticisms of legibility research, typical of those with first-hand knowledge of typography, were first voiced by Buckingham (1931) – although his own experiment was fairly unconvincing. In particular he criticizes the univariate research model, in which experimenters try to vary a single factor while holding all others constant. Buckingham comments:

‘This is good experimental technique. It is an article of faith among investigators. Yet it won't work in the way it has been applied to typography unless one is prepared to go to very unusual lengths with it.’ (p. 104)

He goes on to note that (mostly paraphrased):

- ‘several of those who have given out standards have simply used their imagination’ (that is, the recommendations do not always relate to the data).
- typographic variables interact: recommendations about line length, for example, ‘are valid only for the interlinear spacing employed, and the investigators do not tell us what that is. Widen the spacing and the probability is that a longer line may be employed to advantage.’
- investigators often refer to, say, ‘10pt type’ without reporting the typeface used or the interline space.²²
- printers perceive the investigators' ignorance of typographical matters and ignore the results anyway.²³

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21 Paterson & Tinker (1940)

22 Although, according to Spencer (1969b), the need to measure the visual rather than the body size of type was first pointed out by German researchers in 1903, this single fault mars much of Tinker's work and that of his contemporaries.

23 Later critics suggested that psychologists should take advice from designers in formulating their hypotheses (Spencer 1969b; Burnhill & Hartley 1975; Macdonald-Ross & Waller 1975)

- to do a full study of even a modest range of typefaces, sizes, line lengths and line spacings would require more effort than anyone is prepared to put in (he outlines a simple study that would have required 1,792,000 returns).

In addition to Buckingham's criticisms, others have noted that:

- technical research papers are ignored because they are difficult for printers and designers to understand (Rehe 1974). This may be a rather more patronizing version of Buckingham's similar point. Rehe's own book is itself clearly written, although somewhat uncritical. Spencer's (1969b) review is a model of both clarity and discrimination.
- 'the classical research literature in this field has concerned themselves with molecular issues (ie with tiny details) rather than with molar ones (ie broad scale issues).' (Hartley & Burnhill 1977a: 223)
- the research tends to be 'divorced from the questions which are actually asked by practitioners when a choice of typeface has to be made.' (Hartley and Burnhill 1977a: 224). Designers would like more details of the performance characteristics of individual typefaces: for example, can they be reduced or photocopied?

In spite of the problems, Tinker and others are still frequently cited where scientific evidence is thought necessary to make design recommendations more convincing. And there are those who regret the passing of this style of research. Rehe (1974) concludes his review of legibility research by calling for more of the same:

'Univariate research, that is, investigation of individual typographic variables, should be increased and broadened. These individual research findings are the particles of the mosaic that make for better legibility.' (p. 61)

Scientific evidence is also attractive to those who apparently regard all intuitive judgements, whether by novices or experienced practitioners, as equally unreliable. In this regard we may recall Tinker's comment that

'Before scientific research, printers and type designers were concerned mainly with the esthetic appearance of the printed page. This preoccupation with esthetics, together with considerations of economy and tradition, dominated all typography until about 1920. As a result of these obstructive emphases, a scientific typography has been slow in developing. Indeed, the printing industry continues to resist procedural changes suggested by experimental findings.' (Tinker 1965: 115)

Elsewhere Tinker does acknowledge that, on the whole, printers often make good decisions without the benefit of research. Together with the fact that many experiments reveal only small differences, if any, this has led most typographic researchers to the opinion that it is not worth investing in traditional legibility research. Since the late sixties, research on simple matters of legibility has tended to be undertaken only in special

circumstances. New display technologies are of obvious interest and ergonomists continue to publish numerous studies of the ‘human factors’ of CRT displays (eg, Reynolds 1979; Bouma 1980; Shurtleff 1980). In addition, new type designs and page layouts are sometimes evaluated by their designers without the results being published. Foster (1980) has reviewed recent legibility research.

Herbert Spencer, Linda Reynolds and other colleagues formed the Readability of Print Research Unit at the Royal College of Art from which a number of publications on legibility emerged in the late sixties and seventies. With the exception of Sir Cyril Burt (Burt, Cooper & Martin 1955; Burt 1959/1974), who consulted with Stanley Morison, Beatrice Warde and other leading typographic pundits of the day, the RCA team was perhaps the first to combine the skills of psychologists and designers, thus overcoming at least one of the criticisms of the earlier research. Although initially the emphasis was on legibility, they also looked at aspects of typographic and spatial signalling – for example, the layout of bibliographies (Spencer, Reynolds & Coe 1975). These studies had relatively modest and realistic goals. Essentially they were comparisons of a range of solutions to easily identified and frequently recurring psycho-motor problems of scanning or searching. Searching for a name in an index or bibliography, for example, is an easily-defined and common task. It is therefore valid to apply the findings directly to practical situations.

Developments at the RCA were paralleled by another prolific psychologist-typographer team, James Hartley and Peter Burnhill, who similarly moved from legibility research to structured information, including the design of academic journals (Hartley, Burnhill & Fraser 1974), textbooks (Burnhill and Hartley 1975), indexes (Burnhill, Hartley & Davies 1977), and bibliographic references (Hartley, Trueman and Burnhill 1979). Where other researchers were usually content to investigate simple issues and report the data, Hartley and Burnhill proposed a conceptual framework for their own work which, since it goes beyond psychological issues, I shall return to shortly.

Atmosphere value: the affective domain

I have noted that typographers are often aware of the expressive properties of the typefaces they use. Following the lead of Berliner (1920), a number of psychologists have enquired whether this awareness is shared by readers. Early studies required subjects to choose typefaces appropriate for particular products (hers were fish, pancake flour, pork and beans, and marmalade). One of most thorough series of studies of this kind was reported by Ovink (1938) whose subjects rated the suitability of typefaces for different text topics (literary styles, ideas, and commodities).

Unfortunately, as with many typographic studies, his results were obtained with typefaces that are now mostly obsolete. Ovink does, however, provide a means for the ‘translation’ of his results to other typefaces, since he analyses their characteristics using a scheme originally designed to describe personality differences in handwriting. The same scheme could presumably be applied to modern typefaces to identify equivalents.

More recent studies (reviewed by Rowe 1982) attempt to overcome this problem by using the semantic differential technique, considered more respectable by modern psychologists than handwriting analysis. Typefaces are related to topics indirectly, via general dimensions such as ‘hard/soft’, ‘active/passive’ and so on. The suggestion is that a typeface with particular qualities could be used to imbue a message with the same qualities. Walker, Smith and Livingstone (1986) have also published data demonstrating that typefaces considered by subjects to be suitable for advertising different professions, turn out to have similar connotations to those professions when tested separately.

Zachrisson (1965) has noted about his own and other studies of atmosphere that researchers have failed to take account of the artistic or literary education of subjects: that is, their ability to discriminate between typefaces which, in the case of book faces, can look very similar to the lay person. Moreover, descriptive terms thought up by experimenters may not be meaningful or relevant to subjects. Bartram (1982) tried to overcome this last objection by eliciting descriptive dimensions from subjects themselves. His purpose was also to provide designers with a means to test their intuitions against the perceptions of their audience (following Sless 1980).²⁴ He therefore supplied a procedure and a simple statistical technique for designers to conduct their own research when necessary. This goes some way towards meeting an objection raised by Spencer (1969b: 29):

‘a review of press advertisements, in which typographic allusion is often a vital ingredient, published over the last half century suggests that findings on congeniality may have little temporal stability’.

A reasonable assessment of this work is that, while studies of atmosphere value do not provide direct guidance about typeface choice, as some authors claim, they do substantiate the common sense view that typographic style is noticed by readers and that their interpretations

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24 Sless devised an exercise to encourage graphic design students to be more objective. Each had to make a random ink-blot and identify an object that it resembled. Having done so, they asked others to identify it also. Inevitably there was considerable disagreement. Students then had to make the minimum modification that they considered necessary to make the ink-blot look unmistakably like the intended object, before testing it again. The cycle was repeated until the image was reliably identified by all observers. Some students found it very hard to accept that others could not interpret the image in the same way as themselves – it usually takes several cycles more than the student believes possible at the outset. The exercise has become a regular first-year project in some art schools.

are not random. Although there is some disputed evidence that reader preferences affect reading speed (Burt, Cooper & Martin 1955),²⁵ it is reasonable to suppose that anything about a text which is discernible to readers may affect their perception of the status of a document and thus their expectations, critical stance, reading strategies, goals and outcomes. It is hard to see applied psychologists going much beyond the present findings. Laboratory-style experimentation is rather a clumsy instrument to probe subtle issues – for example, how texts, through their use of stylistic nuances, may be seen to be ‘quoting’ other texts.

Typographic cuing: the cognitive domain

Some psychologists have looked at the effect of ‘typographic cuing’ on learning (reviewed by Glynn, Britton & Tillman, 1985). The term generally refers to the use of typography (bold or italic type, or underlining) to signal the important ideas in a text. In most studies, importance is assessed not by the author of the prose passage used, but by the experimenter or a group of independent judges. It is therefore a separate system of signalling overlaid onto the signalling already implicit in the author’s prose structure. In this respect typographic cuing is similar to other devices, sometimes known as ‘adjunct aids’, proposed and tested by educational researchers. These include advance organizers (Ausubel 1963), behavioural objectives (cf Davies 1976), and inserted questions (Rothkopf 1970), although these devices are more genuinely rooted in pedagogical theories.

There is little doubt that cuing does work in drawing attention to the cued material. The consensus is that people are more likely to remember cued ideas. Some researchers, though, (for example, Glynn & Di Vesta 1979) have found that this is achieved at the expense of uncued ideas. It should also be noted that most studies of typographic cuing improve immediate recall, but do not improve delayed recall. Quite apart from methodological objections raised by Hartley, Bartlett & Branthwaite (1980),²⁶ these conclusions are not altogether unexpected, since the cuing is effectively giving subjects the answer to the recall questions beforehand. Indeed, Coles & Foster (1975: 105) suggest that the failure of typographic cuing to improve test scores in the first part of their own study might have been because

‘not having been informed that cued material would subsequently be tested, the students may have found cueing confusing or even distracting rather than helpful’.

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²⁵ The evidence is disputed, in part, because of the general discrediting of Burt – a leading psychologist of his day – who is alleged to have ‘cooked’ the data from his experiments on intelligence, and ‘invented’ co-workers. Hartley & Rooum (1983) have re-examined Burt’s typographic work in the light of this scandal and expressed doubts.

²⁶ Hartley, Bartlett & Branthwaite (1980) criticized the experimental rigour of some of the studies they reviewed, in particular the failure of some researchers to test the comprehension of uncued as well as cued items, and the failure to equate the time taken by subjects in the experimental and control groups.

Some studies have tested more innovative and unusual typographic formats. A number of these were published in a special issue of *Visible Language* by Hartley & Burnhill (1981). Since they followed the admirable practice of that journal in requiring contributors to practice what they preach, readers may judge the effectiveness of the new formats for themselves.

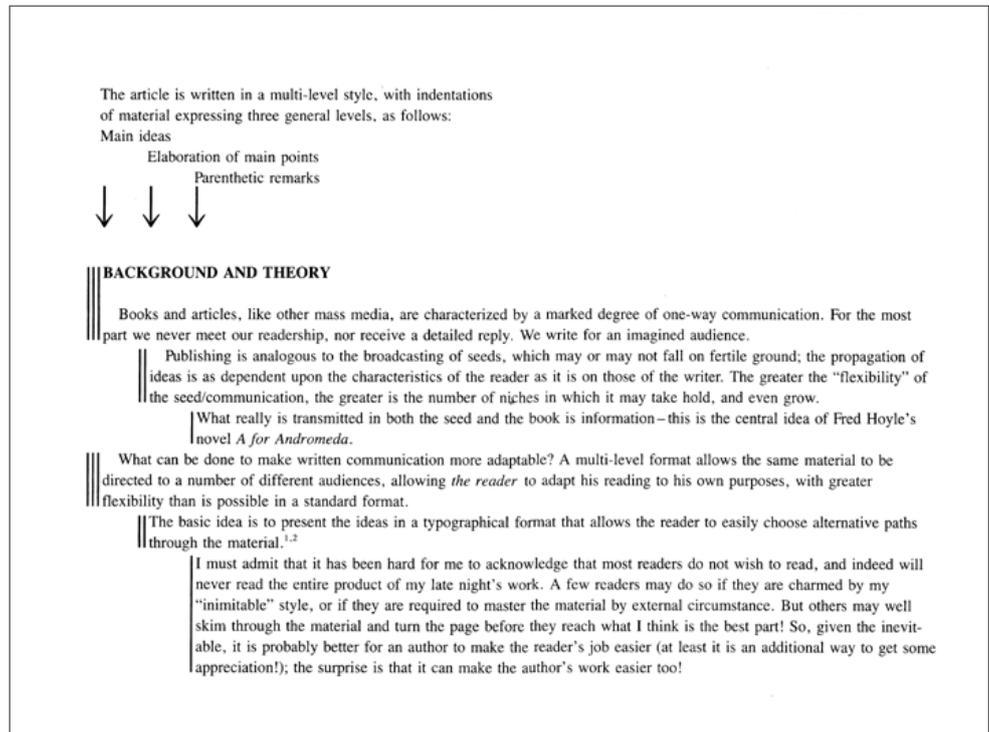


Figure 1.9 A page from Jewett (1981) illustrating his proposal for 'multi-level writing'.
 Dimensions: 228mm x 152mm

Jewett (1981) uses different levels of indentation to indicate hierarchical levels of argument (Figure 1.9). His article is printed sideways, presumably to allow the generous indentation that he uses for his three levels of importance. There seems no reason why it should not have been printed conventionally, though, since the resulting line length is excessively long: ironically, this hinders quick scanning, although the hierarchical system is meant to facilitate it. Furthermore, it is not possible, as might be thought, to scan the article while ignoring lower levels of the hierarchy. Higher level paragraphs sometimes make reference to information contained in the lower level ones they follow. Although Jewett claims that his format makes writing quicker by absolving the writer from the responsibility of verbalizing the hierarchical structure, it seems to have been impossible to shake off the habit.

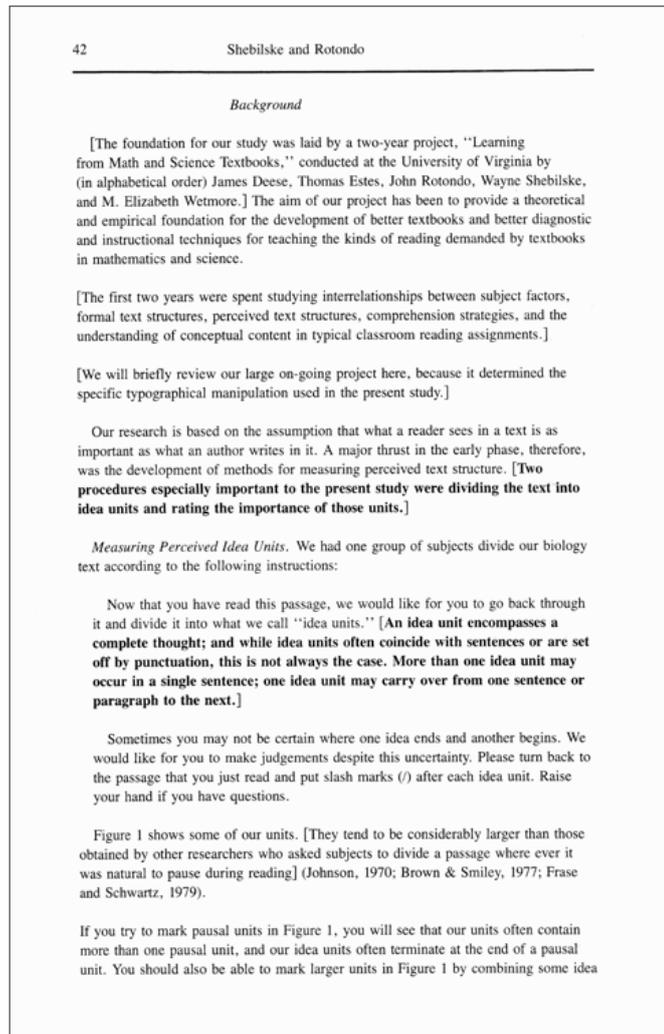


Figure 1.10 A page from Shebilske & Rotondo (1981) showing their use of typographic cues. Dimensions: 152mm x 228mm.

Shebilske & Rotondo (1981) distinguish between three kinds of 'content': in addition to uncued text, bold type indicates 'important' ideas, and square brackets indicate the 'gist' of each idea. For this reader at least, Shebilske & Rotondo's article proved almost impossible to read in the sense in which it was intended (Figure 1.10). While their bold type (the gist of important ideas) corresponds roughly to its conventional usage, the use of parentheses was a major obstacle. Their use of parentheses to signal the gist of an idea is directly counter to their normal meaning, which is to interpolate unimportant (parenthetical, in fact) material. Moreover, we normally think of the 'gist' as the essence of an idea that particular explanations allude to; we may expect to see it eventually realized in the form of a summary or catch-phrase, but we do not expect to see each sentence or paragraph contain a kernel of words which can be set apart typographically as the 'gist'.

Although Shebilske & Rotondo substantiated their proposals with improved comprehension and favourable reader reactions, they did not directly compare their rather complex system with simple cuing: readers might have been only paying attention to the capitalized ideas. In fact, the favourable reader comments quoted in the report seem to be referring to the highlighting of important ideas rather than the bracketing of gists. It is possible that subjects simply ignored the brackets. Indeed, an earlier study by Hershberger & Terry (1965) did compare various levels of complexity for cuing (up to five levels of importance were cued), and found no advantage in distinguishing between more than two levels.

Researchers working within this tradition see themselves as extending a line of inquiry initiated by Klare, Mabry & Gustafson (1955) and Hershberger & Terry (1965). Writers and researchers outside educational psychology circles are not cited and probably not known about. Apart from this insularity, a view of text as simply containing gist and some unimportant stuff between, is somewhat unsubtle; as is a view of reading in which the task of the reader is limited to rote recall – to remember and repeat certain instructor-designated ideas.

These studies of innovative typographic cuing reflect two wider trends in the typographic literature. Firstly, researchers sometimes give an unfortunate impression of naïvety, both typographically and linguistically. Special functions are assigned to devices such as indention, bold type, line spaces, and parentheses as if they have no pre-existing function. Also ignored is the rich and diverse system of linguistic signalling which can be used by skilled readers to perceive the author's deployment of ideas. Secondly, they exemplify a tendency to want to reform a system which is seen as fundamentally irrational. With the exception of historians describing past practice, comparatively few people have attempted simple descriptions of typographic systems without prescriptive overtones. The reformist tendency is seen most clearly in studies of English spelling (cf Venezky 1970), suggestions to change the direction of writing or to present words in visual stacks (Huey 1898, Andrews 1949)²⁷ and in attempts to design phonetic alphabets or simplify the existing one (cf Spencer 1969b).

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Hartley and Burnhill

Since Tinker's retirement, the most active and widely-cited producers of psychological research on typography have been James Hartley and Peter Burnhill. Partly in response to criticisms levelled at Tinker's generation – that psychologists should collaborate with designers – Hartley, a psychologist, and Burnhill, a teacher of typography, have pooled their skills

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²⁷ There have been a considerable number of experiments. Huey's is the first I have found; Andrews prompted a rash of studies in the 1950s, discussed further in Chapter 7.

to produce research that addresses the realities of typographic decision-making. While their earlier publications addressed ‘traditional’ legibility issues, later papers have tackled a wider range of typographic issues. I have already cited some of their work on structured information. In addition, Hartley has published a number of papers on other aspects of instructional text and the reading process.

Some of the earlier research on ‘reading hygiene’ is conceptually rather barren. It has been briefly reviewed here because it forms a considerable part of the typographic literature and because of the methodological issues that emerged. Hartley & Burnhill, though, command special attention because, unlike many of their colleagues and predecessors, they set out a coherent framework for their empirical research. Hartley and Burnhill claim justifiably that most earlier researchers appear not to have felt the need for any theoretical underpinning:

‘...we would maintain [that] most typographical research has no theoretical base; that is, experimental work has been conducted without reference to a coherent view of the principles entailed in typographical decision-making.’ (Hartley & Burnhill, 1977a: 224)

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They go on to explain the principles of typographic decision-making on which their own research is based. These principles have frequently been restated in a number of books and articles, are widely cited and so deserve critical attention. The three main principles are:

The use of standard page-sizes. Hartley & Burnhill are strong advocates of international standard paper sizes, and all their experimental materials are printed on A4 paper. Indeed, they argue that:

‘recognition of standard page-sizes by research workers is a necessary condition for further development in the design and evaluation of instructional materials.’ (Hartley & Burnhill 1977a: 227)

On the face of it, the recommendation of a standard page size for research is a curious requirement. The same overall pattern may be created with, say 8pt type on an A5 page as with 12pt type on an A4 page, yet there is no suggestion that type size, line spacing or margins should also be standardized. Moreover, it is not clear whether we are discouraged from applying results obtained with one page size to another. Nevertheless, it is perceptive and entirely reasonable to argue that size is a fundamental constraint on what may be displayed on a page using space to structure information, and I will return to this issue in Chapter 7.

The use of grids for pre-planning of pages. A second principle is the use of typographic grids to ensure that space is used consistently and that the printed page can ‘provide a reliable frame of reference from which the learner can move away and to which he can return without confusion’

(Hartley & Burnhill 1977a: 233). Grids are intended to improve upon traditional practice in which it is claimed that:

‘the absence of consistency in the positioning of related parts indicates that layout decisions have been made *during the process* of physically assembling the image (type and illustrations) prior to the process of its multiplication by printing’ (Hartley & Burnhill 1977a: 228; their emphasis)

The consistent use of space to convey information structure. This principle follows on from the last. It states that the hierarchical structure found in much information printing can be conveyed by the systematic use of space. Thus a single line might separate paragraphs, two lines a subsection, and four lines a new section.²⁸ Various corollaries follow from this principle: the practice of centring headings is strongly condemned; and the excessive use of indentation is discouraged, as is an excessive variety of sizes, styles and weights of typeface for headings.

The use of typography to convey information structure must be an unobjectionable, indeed valuable aspect of typographic theory. Consistency, too, is an uncontroversial and traditional aim. But the insistence on the use of space rather than typographic signalling is harder to justify. While it corrects the amateur’s tendency to overcomplexity, elevated to a general principle it seems to represent an artificial restriction of a writing system which has developed in response to functional requirements over many years. Moreover, no psychological reason is given for this restriction: no explanation in terms of perception, cognitive processes, working memory or any other psychological model.

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28 This is somewhat reminiscent of elocutionary theories of punctuation, in which different punctuation marks represent pauses of different length. Lowth (1775/1842: 47) put it this way: ‘The Period is a pause in quantity or duration double of the Colon; the Colon is double of the Semicolon; and the Semicolon is double of the Comma. So they are in the same proportion to one another as the Semibref, the Minim, the Crotchet, and the Quaver, in Music.’ We may also recall the obsolete practice of following different levels of punctuation by varying amounts of space, reported by Walker (1983) from her survey of early typing manuals (a comma is followed by one word-space, a colon by two, and a full stop by three). The difference is that the early typists were using space as a redundant signal, reinforcing the graphically distinctive punctuation mark; Hartley recommends the sole use of space.

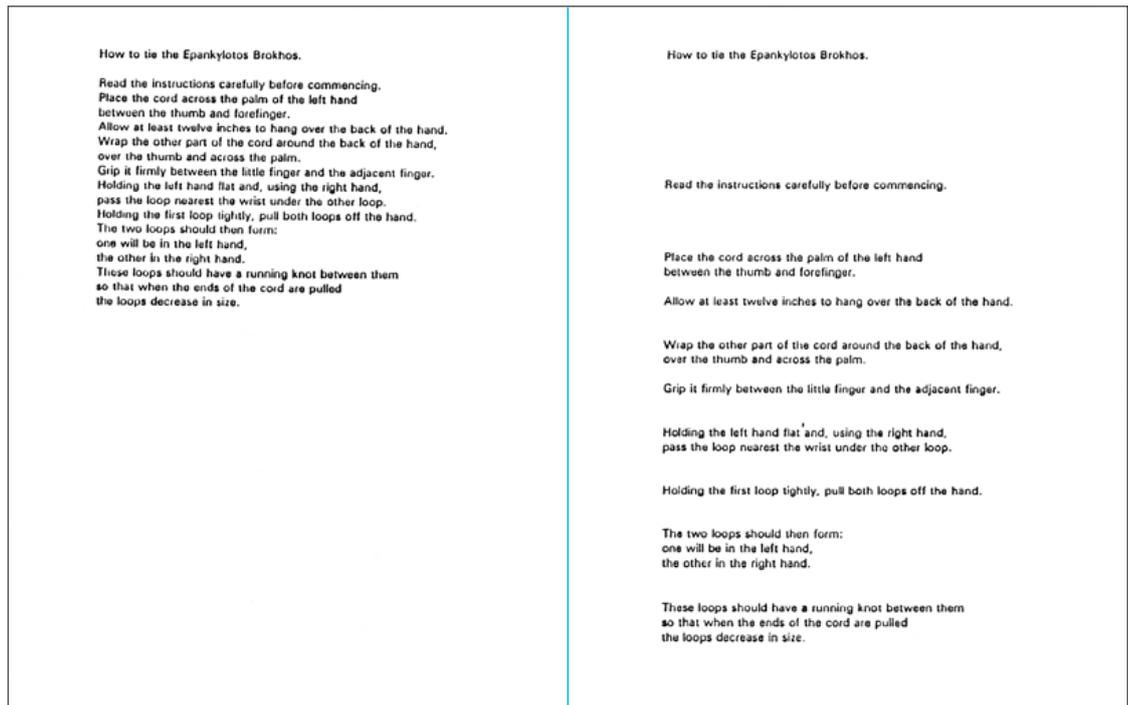


Figure 1.11 Demonstration of the principle of using space to articulate content structure. The right-hand version uses space to group the main stages of the task. Source: Hartley & Burnhill (1977a).

The small scale demonstration in Figure 1.11 is convincing enough, but its application in a large scale complex text, such as Hartley's own book *Designing instructional text* (1985) is more questionable. In a single page demonstration, all the space that surrounds a text unit is visible – the space before and after a section thus gives it shape and distinguishes it from other units in the page or hierarchy. But when interrupted by one or more page breaks, this effect is diluted and often lost altogether. Rather than contributing to a gestalt effect working at a relatively subconscious perceptual level, the space must be consciously interpreted by the reader, who cannot be expected to locate the last or next space of equivalent status in order to complete the gestalt.

This aspect of Hartley & Burnhill's principles reflects a style of minimalist typography that is firmly in the Bauhaus and Swiss tradition. Although they do not share the Swiss pursuit of elegant visual form for its own sake, similar arguments have been reworked to emphasize Hartley and Burnhill's concern for communication clarity. However, whereas printing technology was relatively stable when they started their research in the early 1970s, modern page make-up terminals, and even the cheaper desk-top publishing systems, allow all sorts of facilities which could previously be viewed as unfunctional or uneconomic because of their technical difficulty. Presumably in response to anticipated customer demand,

printing machinery manufacturers have devoted great ingenuity to making ‘irrational’ practices easy and economical.

The disappearance of so many technical constraints does not remove the arguments for a functional approach. Rather it changes its emphasis, since typographic decision-making has more than one facet. Not only must the originators of a printed message make decisions about the placement of components on a page, but so must the users make decisions on the basis of the resulting layout – decisions about the order in which to read the page, decisions about the nature, topic and genre of the text. Designers also need theories about this kind of typographic decision-making. Their own decision-making structure will be comparatively clear to them, enforced by very obvious constraints of equipment, budget and so on. The rationale with which their readers will approach the text is rather less obvious.

Hartley & Burnhill’s achievement is to have moved typographic research, as practised by applied psychologists, from the mundanities of ‘reading hygiene’ towards the altogether trickier area of semantics. Here, the issue is how the appearance of printed material affects not just *how much* is understood, or *how fast*, but *what* is understood from it. However, questions like this cannot be answered in a vacuum. Unless we can describe the characteristics of a typographic display within a fairly standardized descriptive framework, we cannot generalize from results obtained with it. To generalize from an applied psychologist’s experiment to a problem in hand, we need to know what the two situations have in common. But whereas psychologists can experiment with sentence comprehension secure in the knowledge that the concepts such as ‘sentence’ and ‘verb’ will be generally understood (if not agreed upon by all linguistic scientists), no such agreement exists about variations in page layout.

45

The ‘language element’ in graphic communication

Twyman (1982) has directly addressed this relationship between typography and ‘content’. Using a similar example to Hartley’s (a structured list rather than a set of instructions), he goes on to illustrate the effect of different technologies on the ways that graphic structuring is realized in practice.

A particularly telling example is reproduced in Figure 1.12, which shows a printed version of a manuscript original, both dating from around 1473. Where the manuscript, with its easily adjusted character widths, is able to achieve a justified right-hand edge within a two-column layout, the printer needs a wider single column. Again (and closer to Hartley’s concerns), whereas the manuscript signals a major text division using coloured ink, it was less convenient for the printer, who instead introduced extra space.

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Figure 1.12 The same work in manuscript (left) and printed (right). The comment on the new section which is in colour in the manuscript (just above the large initial) is signalled by space in the printed version. Both reproduced from W Hellinga, *Copy and print in The Netherlands*, Amsterdam, 1960.

The conclusion from such examples is that there is a ‘language element’ of graphic communication that underlies such equivalences, and that should be studied seriously ‘in much the same way as linguistic scientists have studied spoken language’. The paper was originally addressed to an audience interested in the technology of printing: its purpose is therefore to show that whereas, historically, the opportunities for graphic expression have been constrained by technology, the design of future technologies might be better informed by a proper specification of the requirements of graphic language.

Graphetics and graphology: the place of graphics in linguistics

The obvious place to investigate the language element underlying typography is linguistics, and some textbooks do indeed mention the terms ‘graphetics’ and ‘graphological’ in symmetrical opposition to ‘phonetics’ and ‘phonology’. (While *phonetics* describes simple characteristics of vocal sounds in speech, *phonology* describes systems and patterns of sounds.) However, this definitional symmetry should not be taken to imply that graphic and phonic factors enjoy an equal status within linguistics.

In practice, graphetic and graphological factors have not received anything like the detailed attention that linguists give to phonology. Moreover, judging by the relevant entries in dictionaries of linguistics, there is evidence of considerable terminological confusion.

- Pei and Gaynor (1954) list only *graphemics* as ‘the study of systems of writing and their relationship to linguistic systems’, a fairly broad and inclusive definition.
- Hartmann and Stork (1972) list *graphology* as equivalent to *graphemics*. To them, though, graphemics is limited to ‘the study of the graphic signs used in a particular language’. The separate term, *graphetics*, is introduced to describe

‘the study of the graphic substance and the shapes of written signs *without* regard to a particular language or writing system’ (my emphasis).
- Crystal (1980) agrees with Hartmann and Stork’s definition of *graphemics* and, like them, equates it with *graphology*. He clarifies Hartmann and Stork’s conception of *graphetics* (which sounds rather atheoretical and pointless) by including properties of the written medium such as colour, type size and spacing.²⁹
- In addition, *graphonomy* has been defined by Hartmann and Stork as the same as *graphetics*, but by Pei and Gaynor as the same as *graphemics*. Hartmann and Stork also list *graphics* and *grammatology* as synonyms for *graphetics*.
- *Grammatology* is given further prominence from its use by Gelb (1963) to denote the study of writing systems in general (eg, ideographs, pictographs, alphabets, syllabaries etc). The French deconstructionist philosopher Derrida (1967/1976) also uses the term; to him writing is not so much a physical act or product as a complex metaphor at the root of all philosophy and science (following Freud’s metaphor of the psyche as a ‘mystic writing pad’). After the usual time lag, Derrida’s ideas are gaining currency in the English-speaking world, and will possibly be the next major influence on future typographic theory.

For our purposes it is probably best to disregard all these terms except graphetics and graphology. Crystal and Davy (1969) explain the difference as follows:

‘at [the graphological] level, we are laying stress on the contrasts that can be made within the linguistic system, rather than on the system itself, which was studied at the [graphetic] level’.

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²⁹ The graphetic/graphemic distinction follows a general use of the *emic/etic* suffixes within linguistics. Crystal (1980) explains the difference in this way: ‘An “etic” approach is one where the physical patterns of language are described with a minimum of reference to their function within the language system. An “emic” approach [or “ological”], by contrast, takes full account of functional relationships’.

This, however, implies that graphetics is the study of *systems* of marks (that is, rules for their combination), whereas the dictionary definitions quoted above give the impression that it is simply the marks themselves that are studied.

We could clarify the graphetic/graphological distinction in the following way: taken individually, visual techniques such as the design of letterforms, symbols, rules, tints and boxes might be seen as graphetic; but when they are used together to structure a whole text, we see a graphological system at work. The origin of the serif, the design of more legible type, the choice between the open and closed bowl ‘g’ are examples of graphetic issues, interesting in themselves but not contributing to our understanding of how graphic factors are used in the display of textual arguments. For example, two editions of Shelley’s poems, the one set in Bodoni and the other set in Univers, may differ from each other and the original manuscript at the graphetic level (being set in different types) but both are expected to follow the author’s original graphology – his use of indention, capitalization, punctuation and spacing.³⁰

This is not to say that typeface selection is a trivial graphetic matter. As Twyman (1982) pointed out, the same structure can often be signalled equally well by either spatial or stylistic variation, and the actual method used is often a function of the production system. Returning to my poetry example, typeface selection would thus become a graphological matter if the context allowed a choice: for example, if the poems appeared in a book where different typefaces were used for each poet.

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Given this definition, it is hard to see why graphetics is of any potential interest to a linguist, rather than a palaeographer, since all meaningful contrasts are classed as graphological. A similar distinction, but of more use to the linguist, is made by Twyman (1982, 1986), between extrinsic and intrinsic features of verbal graphic language. By ‘intrinsic’, Twyman means ‘the range of characters available on a given [composition] system’, and stylistic variations of those characters (italic, bold etc; letterform style; letterform size). ‘Extrinsic’ refers to manipulations of the characters (configuration, micro- and macro-spacing, colour).

There is a superficial similarity between the graphetic/graphological and the intrinsic/extrinsic distinctions, since both graphetic and intrinsic factors involve an inventory of ‘graphemes’ or characters – minimal units of graphic language.³¹ The difference is that Twyman applies both his descriptors at

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³⁰ The question of the extent of the author’s responsibility for these matters is the subject of some controversy among bibliographers. The issue is discussed further in Chapter 7.

³¹ A recent paper by Henderson (1985) discusses the range of uses of the term ‘grapheme’. An even smaller unit, the ‘allograph’ is sometimes also referred to; an allograph is a graphic feature which may appear in a number of different graphemes – for example, a near-identical allograph is usually used for the ascender of the lower-case ‘h’, ‘k’, ‘b’, ‘d’ and ‘l’

the graphological level of analysis, pointing out that a particular semantic distinction might be made with a combination of intrinsic or extrinsic features: the status of a quotation in a textbook, for example, might be signalled by the use of a change in typeface (intrinsic to the composition system)³² or by the use of space (extrinsic to the composition system). Twyman uses the intrinsic-extrinsic distinction to illustrate differences between the typical output of four composition systems: manuscript, hot-metal, photocomposition and videotex. In this respect the model is an important tool for analysing artefactual influences on graphology.

A broader treatment of graphology is by Mountford (1969). Owing to the context of his paper (an encyclopaedia entry), he confines himself to matters of definition and classification rather than the analysis of examples. He proposes and discusses ten 'groups of features' with which to describe 'the graphological structure of traditional orthography (in its printed prose variety)' (Table 1.2).

Category	Example from typical printed prose
1 Colour contrast	black on white
2 Orientation	left to right
3 Disposition	page layout, paragraphing
4 Graphological layering	punctuation hierarchies
5 Graphemic composition	sets of letters, figures, punctuation marks
6 Graphomorphemic typology	syllables
7 Differentiation resources	italics, bold
8 Capitalization	proper names
9 Graphetics	actual letters etc (as distinct from 'paradigm' letters described in 5)
10 Flexibility	open-ended (as distinct from less flexible ideographic writing systems)

Table 1.2 Ten groups of graphological features (Mountford 1969).

It should be remembered that terms like these are intended to describe writing systems rather than examples of writing. The relevance of some of the distinctions made becomes more apparent when applied to non-roman or innovatory writing systems (eg, Chinese, shorthand, etc). In later papers, Mountford (1980, 1982) developed further ideas on the analysis of written language, which I shall return to shortly.

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32 A further linguistic parallel with Twyman's intrinsic/extrinsic distinction is that between inflected and positional languages. Inflected languages (such as Latin) rely on word endings and other inflections to establish grammatical relations, and, unlike positional languages (such as English), are relatively indifferent to word order.

In practice, the discussion of definitions is rather academic: a search of *Language and Language Behavior Abstracts* revealed only a handful of papers on any of these topics between 1973 and 1985, and few were relevant to this review. Many of the 86 papers using ‘graphemes’ as a key word were about detailed matters of grapheme-phoneme relations, in the context of spelling reform, palaeography or reading instruction. Some papers on ‘graphology’ turned out to be on personality assessment from handwriting. Other papers were about non-Roman scripts. Indeed, Crystal (1980) remarks in his dictionary entry for ‘graphetics’:

‘So far little analysis of texts in these terms has taken place, and the relationship between graphetics and graphology remains unclear.’ (p. 169)

Why have graphic factors received so little attention from modern linguists? Compared with other, weightier, matters that preoccupy the relatively young discipline of linguistics (such as ‘what is language?’), they are presumably seen as relatively trivial,³³ although necessary to mention when the existence of writing is to be acknowledged. It is not always acknowledged as a proper subject for linguists to study. This view stems directly from de Saussure, usually regarded as the founder of modern linguistics and semiology, who placed writing outside the linguistic domain:

‘Language and writing are two distinct systems of signs; the second exists for the sole purpose of representing the first.’ (de Saussure 1916/1974: 23)

So the terminological problem reflects not so much a major debate on fundamental issues as the largely peripheral status of graphic factors within linguistics. This is, for the most part, a necessary restriction: illustrations, to take an extreme example, are part of ‘the text’ as it is viewed by an ordinary reader, but they are clearly non-linguistic. But while graphic factors may at present be at the periphery of the linguistic field, at least two major boundaries of that field have come under pressure in recent years. One is the primacy of speech; the second is the restriction of the sentence boundary.

The primacy of speech

Vachek (1973) documents much of the debate concerning the status of writing in linguistics. In addition to de Saussure, Vachek cites the opposition of many of the most influential twentieth century linguists to the view that writing is something more than the transcription of speech. Bloomfield (1935: 21), for example, considered that ‘writing is not language, but merely a way of recording language by means of visible marks’. Vachek

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³³ As Wilson (1844: 4), speaking of punctuation, puts it: ‘The mental philosopher and the philologist seem to regard it as too trifling for attention, amid their grander researches into the internal operations of mind, and its external workings by means of language.’

quotes similar remarks from influential linguists from both earlier (eg Sapir 1921) and later generations (eg Hockett 1958).

The tone of the primacy of speech advocates is emphatic, even intemperate at times. Thus de Saussure (1916/1974) speaks of the ‘tyranny of writing’, of its ‘usurping’ role, of ‘abuses’, of the ‘annoying’ tendency of grammarians who ‘never fail to draw attention to the written form’. The title of one section of his *Course in general linguistics*, though, may explain the tone: ‘Influence of writing; reasons for its ascendancy over the spoken form’. At the time (the *Course* is based on lectures given between 1906 and 1911), de Saussure’s purpose was to replace prescriptive grammars based on literary forms³⁴ with a more fundamental description of natural language. Bloomfield’s remarks were made in the context of the development of techniques for the description of unwritten Native American languages.

The influence of de Saussure and Bloomfield was such that Bolinger (1975: 476) could refer, in his linguistics textbook *Aspects of language*, to the ‘old-fashioned’ relationship between writing and speech, in which the only level of equivalence is that of grapheme and phoneme. His alternative approach is to view writing and speech as ‘more or less independent systems that tend to run parallel but converge more and more and finally intertwine’. The two systems, he suggests, are related at various levels (grapheme to phoneme, morphographeme to morphophoneme etc) but are not dependent on one another. Instead the listener or reader can usually interpret speech or writing without reference to the other mode. Indeed, each mode can use elements that have direct meanings without the need for ‘arbitrary’ units such as phonemes and graphemes: speakers may use gestures, writers may use pictures or symbols.

Although linguistic scientists have claimed to study spoken, not written language, it is ironic that transcriptions of actual speech show that ‘grammatical’ sentences are rare (cf Tannen 1982). When linguists discuss syntax, they generally use idealized examples which conform to the norms of written language (in which gesture, feedback and a shared context is absent). Taylor (1984) and de Beaugrande (1984) have identified some of the tacit rules by which linguists commonly edit language samples into a form they can analyse.

The sentence level

The preoccupation of linguistics with speech was accompanied for many years by Bloomfield’s additional restriction of linguistic enquiry to the level

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³⁴ Cohen (1977: 50) remarks on the relatively detailed attention given to graphic factors by early linguists: ‘The language texts of the period [1640–1785], reflecting an effort to represent the obvious sense of the written language, include sections on punctuation, capitalization, and often, handwriting and type styles. These sections are significantly prominent.’

of the sentence. De Saussure had earlier made the important distinction between *langue* and *parole*, sometimes translated as ‘language system’ and ‘language behaviour’. The task of linguistics has generally been to reveal the language system or grammar that underlies language behaviour. Since the sentence seems to be the highest level at which concepts of grammaticality are intuitively agreed by language users, the proper study of linguists is restricted to sentences. The construction of larger units, such as paragraphs, is more a matter of rhetorical choice than the application of grammatical rules.

In view of this restriction, it is not surprising that graphic factors have featured so little in linguistics. Indeed, we may wonder why graphetics and graphology should ever have been posited by linguists in the first place. The sentence is a level at which few complex graphological events occur. Graphology becomes more interesting in non-sentences (such as bibliographic lists or equations) or in texts with headings, tables, footnotes, and other components which lie outside the scope of sentence grammar and which have received relatively little attention from linguists.

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Some linguists who have noticed graphic aspects of language

It is noticeable that all of the linguists who have written about or acknowledged graphic factors (other than for the limited purpose of comparing writing systems) have moved away from the restriction to sentence level linguistics. Such linguists are few enough to be able to list here.

Crystal

David Crystal and Derek Davy’s *Investigating English style* (1969) describes their approach to the study of stylistics, a branch of linguistics that tries to describe and account for variations in the language of, for example, religion, sports journalism or advertising. Since they divide their examples equally between spoken and written language, Crystal and Davy are clearly sensitive to the differences between them. Indeed, they preserve the typography of their examples of written language, and comment on it in their discussion.

Crystal and Davy’s descriptive method is hierarchical, using five levels of description. While the three higher levels – grammar, syntax and semantics – are common to both speech and writing, parallels are identified at the two lower levels between phonetics & graphetics and phonology & graphology. However, although the two graphic terms are apparently to be given equal weight to their phonic equivalents, in practice most attention is given

to speech. As they acknowledge, ‘there is no agreed terminology for the discussion of graphetic and graphological contrasts’ (p 23).

This is borne out in Crystal and Davy’s commentary on the written examples. It is of a lay person’s commonsense sort, and is not phrased in a particularly technical manner or in a specifically linguistic sense. They refer, for instance, to ‘eye-catching’ features or ‘places for the eye to rest’. This may not be a problem in itself – there are good reasons why we should resist the cloaking of typographic study in scientific mystique – but in the context of linguistics, where such cloaking is the norm, it is symptomatic of theoretical neglect. Two reasons for the dearth of terminology might be suggested.

First, graphological samples do not present the same problem of transcription as phonology: they are already in written form and available for inspection and analysis. Crystal and Davy’s examples of spoken language are transcribed using an essentially selective notation which includes such things as pitch, timing and emphasis but ignores other paralinguistic or contextual features such as the vocal timbre, sex, age and appearance of the speaker. So the problem of transcribing speech is bound up with its analysis – with the selection of its salient features and the identification of relevant units and boundaries. Since written language does not need transcription, it does not receive the corresponding analysis. For example, while their transcriptions of speech show evidence of detailed thinking about the relative importance and the role of each feature, Crystal and Davy’s examples of written language are presented in an unmediated form. Their comments about graphological aspects of the written examples do not give the impression that they are the result of a careful sorting of linguistic from non-linguistic features.

Second, our alphabetic writing system enforces a simple segmentation on language and so seems to exclude ‘non-segmental’ or ‘suprasegmental’ effects. In speech, pauses and ‘tone unit’ boundaries do not always occur at points where a writer would punctuate, and not necessarily at word breaks. To cope with this, notations for transcribing speech normally embody a technique for indicating ‘prosodic features’ – changes in speed, tone of voice, and pitch. Musical notation is an obvious parallel: notes are grouped on the basis of timing, loudness and expression – three systems that are fairly independent of each other and may not share the same segment boundaries. It may be that the relatively simple segmentation of written language makes graphology appear theoretically less interesting than phonology to linguists. This certainly appears to be the case for Crystal and Davy who devote much space to the problem of describing non-segmental phonology (also termed ‘prosody’); their discussion of grammar, too, is

effectively weighted towards spoken language with its problems of vague sentence boundaries and frequent ‘ungrammatical’ constructions.

Schematic relationship between graphological features of text and other linguistic levels

	<i>Graphology</i>	<i>Phonology</i>	<i>Grammar</i>	<i>Semantics</i>
1	feature	↔ feature	—	—
2	letter	↔ phoneme	—	—
3	letter cluster	↔ phoneme cluster	—	—
4	graphic syllable	↔ syllable	—	—
5	graphic word	phonic word	word	lexeme
6	word cluster	some prosodic features	sentence analysis	information
7	line	—	—	—
8	line cluster	—	—	information
9	paragraph	—	—	information
10	paragraph cluster	—	—	information
11	layout	—	—	information
12	page	—	—	information
13	page cluster	—	—	information
14	text	—	—	information

Figure 1.13 Crystal's levels of graphic organization (redrawn)

Crystal considers written language in more detail in a later paper (Crystal 1979), identifying fourteen levels at which graphological units could be distinguished (Figure 1.13). In this exploratory paper, originally read at conference of the UK Reading Association, Crystal addresses the question: what levels of response might be expected from readers to different levels of organization? He applies each of fourteen levels of graphic organization to three aspects of language, semantics, grammar and mode of transmission (writing and speech).

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The main point Crystal wishes to make with this framework has to do with the status of the line, the only feature which, being entirely an artefact of the printing process, has ‘no storable correlation with any other level’. He goes on to review research on semantically-controlled line endings for beginning readers (who can be observed to have problems coping with line breaks). This particular issue is discussed in more detail in Chapter 7. In relation to the present review, though, two other notable points emerge from Crystal's analysis. Firstly, above the level of the line, all links with phonology and grammar break down, while below that level the links are fairly trivial. From a traditional linguistic point of view this suggests that there is little interesting that can be gained from written data that cannot be equally well gained from spoken data.

Secondly, at and above the level of the line, the links are solely semantic, and consist of rather vaguely-indicated correlations with ‘information structures’. This suggests, again from a strictly linguistic point view, that graphology above the level of the line is outside the domain of the most central and exclusively linguistic concern of linguistics – syntax. As we review the work of other treatments of typography by linguists we will find further evidence of the importance of the communication context and purpose – rhetorical factors that ‘pure’ linguistic science has often been happier to ignore.

Vachek

Josef Vachek (1948/1967, 1959, 1973) is an old campaigner for the recognition of written language as autonomous from spoken. A member of the Prague School of linguists, he follows two practices associated with that school.

Firstly, Vachek defines speech and writing from a functionalist perspective. Functionalism, in the linguistic context, refers to the idea that language features stem from the function of language in the community of language users. For example, since asking questions, making statements and giving orders are universal uses for language, grammarians can expect to find interrogative, declarative and imperative forms in most languages. Better known examples concern vocabulary: one doesn’t expect tropical dwellers to have a word for snow, since they would never have a function for such a word.³⁵ The Prague School’s functionalism reflects their rejection of Saussure’s distinction between *langue* and *parole*.

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Vachek’s functional analysis of writing and speech is as follows:

‘The spoken norm of language is a system of phonically manifestable language elements whose function is to react to a given stimulus (which, as a rule, is an urgent one) in a dynamic way, i.e. in a ready and immediate manner, duly expressing not only the purely communicative but also the emotional aspect of the approach of the reacting language user.

The written norm of language is a system of graphically manifestable language elements whose function is to react to a given stimulus (which, as a rule, is not an urgent one) in a static way, i.e. in a preservable and easily surveyable manner, concentrating particularly on the purely communicative aspect of the approach of the reacting language user.’ (Vachek 1973: 15-16)

This analysis suggests that, since speech and writing are distinct in function as well as in mode, we should not expect to find exact parallels between phonology and graphology. For example, the static, surveyable nature of

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³⁵ One is reminded of President Reagan’s famous gaffe when he asserted that there is no word for ‘peace’ in Russian.

writing suggests a role for typography quite distinct from the emotional and immediate role of ‘equivalent’ features in speech, such as tone of voice.

Secondly, Vachek makes frequent use of binary opposites. Applied to lexical structure, for example, pairs of opposites such as ‘lion’ and ‘lioness’ are said to contain a marked and unmarked member. In this example, ‘lion’ is unmarked and ‘lioness’ is marked. The marked can be distinguished from the unmarked not only by the formal addition of, in this case, the suffix ‘-ess’, but also by their asymmetrical functions: thus the two terms can be defined as ‘male lion’ and ‘female lion’, but not as ‘male lioness’ and ‘female lioness’ (the one is contradictory, the other tautological).³⁶ Applied to such examples as actor/actress, or waiter/waitress, this analysis amply illustrates the feminist case.

Vachek (1973) identifies the ‘written norm as the marked member of an opposition whose unmarked member is the corresponding spoken form’. The distinction is made on functionalist grounds:

‘that the situations for which the use of the written norm appears specifically indicated have always something specialized about them, and very frequently such use serves higher cultural and/or civilizational purposes and functions (use in literature, research work, state administration, etc.).’ (p. 16)

In a later paper, Vachek (1979) discusses typographic signalling in some detail, listing a range of functions for which marked sets of graphic symbols (for example, italics) might be used to distinguish text features requiring emphasis or stylization from the unmarked norm (for example, roman type).

A particularly significant point that emerges from Vachek’s discussion is that he appears to consider markedness to be a matter of distributional frequency within a linguistic community rather than just within a particular document. Referring to the Czech and German practice of printing extended passages such as prefaces in italics, he points out that in such circumstances printers have to reverse normal practice by using roman type, an unmarked form, for emphasis instead of italic. Although providing only anecdotal evidence, Vachek maintains that such signalling fails to convince the reader, and that such signalling in an italic context can only be achieved with some other marked set such as bold italic or small capitals. My own observations as a reader convince me of the probable accuracy of Vachek’s position (Figure 1.14 shows an example).

.....
 36 This example is borrowed from Lyons (1977) who goes on to distinguish between different kinds of marking, but for present purposes this simple illustration should suffice.

And now, in order that the reader may leave this disquisition sick to death, as he should be, of the fused participle, a few miscellaneous specimens are offered :—*We cannot reckon on the unrest ceasing with the end of one strike, or on its not being renewed in the case of other trades* (Compare *unrest* with *its*)./It may be that this is part of the meaning & instinctive motive of fish, such as the perch, going in shoals at all./The 'elastic defence', which the Germans have prided themselves on being their speciality./The

Figure 1.14 This reversal of the normal roman/italic markedness relationship is not very convincing, and is aggravated by the switching of roles in the eighth line down. This example is from the second edition of Fowler (1926). Actual size.

This is in contrast to a commonly held view, possibly originating with experiments on the psychology of perception, that figure-ground contrasts are largely a matter of proportion, and that therefore one might expect markedness to be a relative to the proportion of two forms within a particular text. The well known vase-faces illusion (Figure 1.15) illustrates how we are able to switch between seeing the white and the black areas as the figure and the ground. The effect is symmetrical in that if either the black (faces) or the white (vase) occupies too high a proportion of space, we are no longer able to switch between images.



Figure 1.15 The faces/vase illusion

What Vachek describes as ‘the inability of italics to figure as the unmarked member of the opposition ‘italic type / roman type’ suggests that, as with ‘lion’ & ‘lioness’, italic type can be defined as ‘not roman type’ but not vice versa. Further, it could be argued that graphic conventions such as the italic-roman distinction³⁷ can develop, through frequent usage or reasons of historical development, something approaching the comparatively immutable status of natural language (such a status being confined, as with natural language, to a particular language community at a particular time).

This brings us back to the debate about the linguistic status of written language. Although the primacy-of-speech advocates argued that spoken

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³⁷ The history of this particular development is chronicled by Carter (1969).

language is universal while written language is dispensable since it only exists in a proportion of language communities, Vachek's response is that

'the goal to which language development has been directed in any community is the highest possible efficiency of lingual communication and the maximum development of its functional range',

and furthermore that

'language "optimals" should not rank lower in importance than language universals.' (Vachek 1973: 17)

The choice of an optimal language form is, of course, a pragmatic one, dependent on the communication context, the means available, and the purposes and limitations of both speaker/writer and listener/reader. Thus theoretical advances in written language, and especially typography, are not to be expected from a view of language which is confined to explaining how words are combined into sentences.

Werlich

In recent years there has been a significant move away from an exclusive concern with the sentence towards whole texts. Egon Werlich's *A text grammar of English* (1976) has not been widely cited (perhaps not widely noticed) by Anglo-American linguists. Theoretically (at least it appears so to this non-linguist author) it is rather sparsely argued, leaving numerous issues raised but unsettled; however, this brings the accompanying benefit that Werlich (and the reader) does not lose sight of the broader issues by concentrating overmuch on precise details of linguistic form. It is a descriptive exercise, considering an unusually wide range of texts – from advertisements to committee minutes – and describing their typical components and characteristics. In the present context, Werlich deserves mention because he notices typography and, like Crystal and Davy whom he cites, he is usually meticulous in his preservation of the typographic form of his examples, even where no special conclusion is drawn from it. For instance, examples which originated as newspaper articles are printed in narrow columns with rules between.

Although Werlich is clearly aware of graphic and spatial factors in text, he presumably regards them as unproblematic or outside the scope of his grammar. There is no special section on typography, and it does not appear in the index. Where he does mention typography or layout, it is generally accorded the role of text type identifier. Thus we recognize a leading article by its conspicuous position and the newspaper's emblem at its head. I shall look in more detail at Werlich's classification of text types in Chapter 9.

Bernhardt

One of the broadest and most impressive studies of typography from a linguistic viewpoint was recently published by Steven Bernhardt (1985). His paper 'Text structure and graphic design: the visible design' was published in the proceedings of a conference on 'Systemic perspectives on discourse', a field much influenced by the work of MAK Halliday and his co-worker (and wife) Ruqaiya Hasan, whose taxonomy of cohesive relationships lists a wide range of techniques used by writers to link text components (but no graphic ones).³⁸

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A question apparently not answered by Halliday & Hasan is: what leads a speaker or writer to choose a particular texture (their term for a set of cohesive techniques in actual use) over another? They point to social and contextual influences such as the nature of the audience and the purpose of the communication. Bernhardt set out to investigate this question by comparing four texts on the same subject written for different purposes. They are a research report, a legal statute, a brochure and a 'fact-sheet', each addressing the topic of a wetland area of the Great Lakes. Bernhardt comments that:

'In my attempt to explain patterns of rhetorical strategy and the consequent realizations of cohesion with regard to context of situation, it soon became apparent that graphic design must figure prominently in the analysis of patterns of cohesive structuring' (p. 18).

Visually informative lists forms pamphlets directions legal texts textbooks articles novels Non-visually informative
--

Figure 1.16 Bernhardt's continuum of visual organization.

Bernhardt proposes a continuum of visual organization (Figure 1.15) in which various kinds of text are ranged from the visually informative to the non-visually informative. His choice of terms is interesting, since it enables him to confine his analysis to verbal language (that is, to exclude pictures) while admitting spatial and graphic features. Through an analysis of examples, he arrives at a more elaborated schema (Figure 1.16) which characterizes the poles of the continuum at various levels of 'rhetorical control'. The characteristics described look like useful ways of describing particular texts, given Bernhardt's qualification that not all texts will evidence all features.

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³⁸ Halliday & Hasan's (1976) theory of linguistic cohesion is described in Chapter 6.

Visual Organization of Written Texts		
Visually Informative	<i>Rhetorical Control</i>	Non-visually Informative
varied surface offers aesthetic possibilities; can attract or repel reader through the shape of the text; laws of equilibrium, good continuation, good figure, closure, similarity.	Visual Gestalt	homogenous surface offers little possibility of conveying information; dense, indistinguished block of print; every text presents the same face; formidable appearance assumes willing reader.
localized: each section is its own locale with its own pattern of development; arrests reader's attention.	Development	progressive: each section leads smoothly to the next; projects reader forward through discourse-level previewing and backwards through reviewing.
iconic: spacing, headings reveal explicit, highly visible divisions; reader can jump around, process the text in a non-linear fashion, access information easily, read selectively.	Partitioning	integrated: indentations give some indication of boundaries, but sections frequently contain several paragraphs and sometimes divisions occur within paragraphs; reader must read or scan linearly to find divisions.
emphasis controlled by visual stress of layout, type size, spacing, headings.	Emphasis	emphasis controlled semantically through intensifiers, conjunctive ties; some emphasis achieved by placement of information in initial or final slots in sentences and paragraphs.
subordinate relations signaled through type size, headings, indenting.	Subordinate Relations	controlled semantically within linear sequence of paragraphs and sentences.
signalled through listing structures, expanded sentences, parallel structures, enumerated or iconically signalled by spacing, bullets, or other graphic devices.	Coordinate Relations	controlled semantically through juxtaposition, parallel structures, and cohesive ties, especially additive ties.
linkage controlled visually; little or no use of semantic ties between sentences and sections; reliance on enumerative sequences or topicalization of a series.	Linking/ Transitional/ Intersentential Relations	liberal use of cohesive ties, especially conjunctives and deictics; frequent interparagraph ties or transitional phrases.
variety in mood and syntactic patterning; much use of Q/A sequences, imperatives; fragments and minor forms; phrases used in isolation.	Sentence Patterns	complete sentences with little variation in mood; sentences typically declarative with full syntax.

Figure 1.17 Bernhardt's list of rhetorical techniques related to visual informativeness (redrawn).

For some linguists, Bernhardt's introduction of 'visually informative' texts is problematic, since arbitrariness has traditionally been one of the distinguishing features of language, as distinct from other sign systems (Saussure 1916/1974: 67). While an arbitrary sign bears a purely conventional or denotative relationship with its referent, an iconic one resembles or connotes it in some way. Being visually informative, a list (Bernhardt's example of a visually informative text) provides iconic information about the number, order and grouping of its constituent parts. I shall return to the problem of iconicity in Chapter 3.

On the evidence of his citations, Bernhardt appears to be unaware of the graphic design literature, and design features are described in a

non-technical manner. Much of the paper restates familiar ideas (familiar, that is, to most typographers) within Halliday's theoretical framework. This, though, is a major contribution in itself, since Halliday's framework is important but rather difficult for non-linguists to understand (and to be sure that they have understood). In a sense Bernhardt's analysis benefits from his lack of typographic baggage. Unencumbered by typographic dogma, he is able to report things as he finds them, reflecting also the linguist's commitment to the *synchronic* study of systems at a fixed point in time rather than the *diachronic* study of systems developing in a historical context.

It is significant that Bernhardt's interest in graphic design arose out of an interest in rhetorical strategy and in the influence of context, rather than in primary message-making. That is, graphic design is placed in his scheme at a metalinguistic level, describing or structuring a message within a social framework rather than contributing to its propositional content. For Bernhardt, the presence of graphic structuring seems to represent a prediction by the writer about the need to attract readers and allow them a choice of pathways through the message. His analysis is an attractive one, and he has moved apparently effortlessly to an integration of linguistic and typographic ideas that typographers have been struggling with for some time. His paper is perhaps the most significant theoretical work on graphic design in recent years.

Mountford

In a series of papers, John Mountford (1969, 1980, 1982) has addressed the place of the written medium within linguistics. Central to his position is his concept of 'writing-system' which he contrasts with 'system of writing'. The latter term is a broad concept, applied to systems such as the Roman alphabet, the Cyrillic system or the Chinese system. Writing systems (unhyphenated) have been extensively documented by Diringer (1962), Gelb (1963) and Trager (1974).

Mountford uses 'writing-system' to describe particular systems which are 'predicated upon a particular language...the relationship between a language and its writing-system is (or can be) one-to-many' (1980: 224). As an example, he cites four special-purpose writing systems for English which supplement the general-purpose system: *stenographies* (shorthands), *cryptographies* (private or secret systems), *paedographies* (eg the Initial Teaching Alphabet), and *technographies* (which include special phonetic alphabets).

Spelling
Abbreviatory devices
Punctuation
Serialization devices
Differential resources
Identifying devices
Numeric resources
Referral devices
Symbolic resources
Continuity devices
Diacritic resources
Script features
Distinguishing devices
Layout

Table 1.3 Mountford's (1980) list of writing-system components

Mountford (somewhat tentatively) breaks down writing-systems into functional components (Table 1.3), which he uses to classify a great many common graphic techniques. This is a great deal broader in scope than his 1969 classification of graphological factors (cited earlier), which appear mainly to be grouped under 'script features'.

Compared with Crystal's levels of graphic organization, Mountford's scheme accounts for a great many more dimensions of graphic language. It does not seem to be very satisfactory, though, to conflate features that Crystal analysed into fourteen levels of graphological organization under a single heading: 'punctuation (or some wider term to embrace the whole hierarchy of units-within-units from, say, 'book' down to sentences and below'. Whereas Crystal relates his levels to semantic and syntactic aspects of the text, Mountford's functionalism does not extend very far beyond his distinction between writing-systems on the basis of their broad purposes. As a result, the table (which, it should be said, is not the main focus of Mountford's paper, although the only place where he deals with the specifics of writing) is somewhat unbalanced, combining highly inclusive categories (such as 'punctuation' and 'script features', already mentioned, or 'layout') with categories containing only a few members (diacritical resources, numeric resources). The problem seems to be that Mountford, in this particular paper, still seems restricted by the linguist's traditional concept of data: that is, by what may be intuitively deduced from language samples. Any further ordering of the rather arbitrary Table 1.3 would have to be based on a consideration of the semantics and pragmatics of the text. Table 1.4 shows one way in which the various components could be grouped:

Spelling	1
Abbreviatory devices	1
Punctuation	2
Serialization devices	2/3
Differential resources	2
Identifying devices	2/3
Numeric resources	1
Referral devices	3
Symbolic resources	1
Continuity devices	3
Diacritic resources	1
Script features	1
Distinguishing devices	1/2
Layout	2/3

where:

1 = ways of symbolizing verbal language;

2 = ways of displaying the organization of content ;

3 = ways of helping readers to negotiate a course through the text

Table 1.4 Functions of Mountford's writing-system components.

In spite of these reservations, the concept of 'writing-system' is a useful one, although the purpose for which Mountford's scheme was designed is rather specialized (the comparison of shorthand and other orthographies). This present study is only concerned with one of his systems, the general purpose 'Standard English Orthography'. Within that single system, though, there may be a number of distinctive sub-systems or genres. It may be possible to find a range of common functions for which different techniques and conventions are used within different genres of text. To do so will require further analysis of, firstly, the techniques and conventions that are intrinsic to typographic genres and, secondly, the functions typographic text is expected to perform within different genres.

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Conclusion

Prompted by the failure of applied psychologists to adequately specify the nature of their stimulus materials in a generalizable way, I turned to linguistics. However, it emerges that, although linguists sometimes refer in passing to graphic aspects of language, the study of such things is very far from the centre of a discipline concerned centrally with words, their meaning and their rule-bound combination. If we are to find a place for typography within linguistics it will be within that departure from the mainstream that is sometimes called 'text linguistics' or, particularly where interdisciplinary links are made, 'discourse processes'.

This last term reflects two significant departures from the traditional ways in which language has been studied: firstly, the objects of study are whole, purposeful *discourses* rather than isolated sentences; secondly, those discourses are seen in relation to *processes* of construction and interpretation. Typical contributions to the journal *Discourse Processes* or to the series of volumes *Advances in Discourse Processes* (published by Ablex) include contributions from cognitive psychologists, socio- and psycholinguists, ethnomethodologists, and rhetoricians. In their effort to reach out from language to its context, then, links are made with other disciplines, and some of this work will be reviewed in the course of the following chapters.

Before moving on to consider the relationship between typography and language in more detail (in Chapter 3), it is worthwhile to consider further some of the methodological problems raised by this review of the literature. Typographers, psychologists and linguists clearly have different approaches to similar issues. In the next chapter, therefore, I will review some problems associated with the interdisciplinary study of practical problems, in order to refine the goals of this study.

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2

Theoretical knowledge in the world of practice

The literature review revealed a certain amount of difficulty in reconciling different research traditions, and some uncertainty about the form which we might expect knowledge about typography to take. Before following up the specific lines of enquiry suggested at the end of the last chapter, then, it is worth taking some time to focus on some general problems raised there about the conduct of research and the communication of its outcomes.

The myth of the two cultures

Those involved in teaching or researching typography often feel the need to justify the business of theorizing about design. Their critics (for example, Chapman 1978) charge them with irrelevance to real situations, and sometimes imply an irreverence for the mysteries of creativity. Perhaps because of a schooling which forced a choice between arts and sciences at an early age, many of us have inherited what may be termed the ‘two cultures’ attitude, following CP Snow’s famous essay (1959). Depending on your bias, either artists are unsystematic and disgracefully ignorant of the basic facts of Science, or else the creativity, mystery and uncertainty of Art is seen as stifled or tainted by the philistine and plodding empiricism of Science. That dichotomy never did stand close examination and, after thirty years of particle physics, molecular biology and artificial intelligence research – areas of science which question the nature of matter, life and thought, and border on philosophy – it seems somewhat quaint. To some degree it is the researchers’ own fault that they are caricatured as insensitive to the complexities of design: as the previous chapter showed, it is easy to explain why research is rejected by some designers and design teachers as unusable.

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On close examination it is easy to get the impression that the distinction between the sciences and the arts is dissolving. On one hand, philosophers of science have replaced our confidence in the certainty of Science with a highly relativist view that has gained wide acceptance: where we might once naïvely have thought that scientific theories derive from the observation of facts, we are now told that the facts themselves only exist in terms of theoretical frameworks. Popper (1959), for example, argued that scientific theories (or conjectures), far from representing certainties,

are actually characterized by the possibility of refutation. Polanyi (1958) convincingly demonstrated the role of creative intuition in scientific discovery. Kuhn (1962) argued that fact-gathering in the absence of a body of theory or beliefs is a virtually random activity. And Feyerabend (1975) suggested that scientific rationality has been neither the dominant nor the best model, but that progressive science is essentially anarchical. As far as Art is concerned, the twentieth century has seen the Muse replaced by the quasi-linguistic theories of semioticians and structuralists; and we have witnessed the quest for a ‘science’ of design (Simon 1969), although this has met with difficulty and some disillusionment (reviewed by Cross 1980).

In spite of such developments in the philosophy of science, old attitudes certainly survive in typographic research. Some researchers distance themselves from designers through an exaggerated respect for their ‘artistic’, ‘intuitive’ or ‘aesthetic’ judgement, which is seen as entirely closed to the scientific method. The converse of this is a ritual sneer at the unsystematic, even primitive, intuitive approach. For example, Jonassen (1982: x) proposes a ‘technology of text’ which he describes as ‘the application of a scientific approach to text design.’ He continues:

‘It exists as a counterpoint to the artistic and unsystematic approach to text design and layout that has prevailed since petroglyphs were first inscribed on walls’.

He goes on to emphasize that it would be a mistake to apply the technology to anything but expository text: again, the arts are quarantined from the rigours of the scientific approach.

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Ravetz (1971) has warned of the dangers of this assumption that *practical* problems always have *technical* solutions. Drawing a distinction between the technical and the practical, he cites the inability of the USA and USSR, two great technological nations with the (technical) ability to send people into space, to solve their (practical) social or managerial problems. According to Ravetz, technical problems have simple, easily identified goals (for example, a typical civil engineering problem might be to build a bridge over a certain river to carry a specified volume of traffic), while practical problems are bound up with competing social and historical pressures. Technical problems are indeed practical, but practical problems are not always just technical. Those familiar with the typographic research literature may recognise this consequence of technical solutions:

‘If the inquiry avoids “theory” and becomes “empirical”, it can encounter the pitfall of simplifying its objects of inquiry to homogeneous populations defined by classes of simple data; then the complexity and contrariness of the situation, which created the problem situation in the first place, is lost from view.’ (Ravetz 1971: 355).

Taken to extremes, this can lead to experimental hypotheses which appear obvious, trivial and even self-fulfilling. An example of this is a much-cited

paper by Dooling and Lachman (1971) who investigated the effect of titles on the comprehension and recall of text. They prepared a text which was deliberately vague and, depending on the title, was interpreted by subjects as being about Columbus discovering America or men landing on the moon (it referred to unfamiliar rocky landscapes, the ship, the long journey, a new discovery). But no psychologist has yet managed to convince me that this is not a self-fulfilling experiment, since an ambiguous text, by definition, is one which can be assigned alternative interpretations. If it turned out that the text was always understood in one particular way, whatever the title, it could simply be rewritten until vague enough for the experiment to work.³⁹

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Although written in a specialized context, Dooling and Lachman's paper is frequently cited in general research reviews on text design, suggesting that reviewers imagine that their readers need proof before they will believe that vague documents need titles. As the educational psychologist John Carroll once remarked, 'it is a poor science that does not improve on common sense'.

Social scientists have the problem that whereas most physicists deal with matters (in both senses of the word) far removed from everyday life, everyday life is what social scientists study. Taylor (1980) has highlighted the difficulty they have in finding scientific ways to define terms, such as 'personality' or 'style', which ordinary people use constantly in conversation without any trouble.

'An approach attempting to adhere completely to a methodological imitation of the natural sciences could never tell us even as much as what we do already *know*, prescientifically, about behaviour, nor about how we could have arrived at such knowledge.' (p, 4)

Reviewing the educational psychology literature on text design, it is quite common to find what at first sight appears to be a staggeringly naïve view of what counts as knowledge. In effect, a game is being played where a new 'fact' is admitted to the circle of those playing only when an experiment has appeared in the literature to support it. No other knowledge counts. The game is played in code: 'nothing is known about...' or 'we do not know...' means 'no one has published an experiment about...'. My mind seized up for a few seconds when I encountered the following conclusion to a recent review of classifications of research questions:

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'On the whole, little is known about the kinds of questions that may be posed for research' (Dillon 1984: 327).

.....

³⁹ In fairness to Dooling and Lachman, at the time of publication their paper was not especially intended to contribute to the practical literature on text design where it is so often cited. Instead it played an influential role in the general reawakening of cognitive psychology. Their purpose was simply to demonstrate the degree to which contextual inference contributes to the comprehension of language, and meaningful comprehension contributes to memory. Even so, it surprises the lay observer that such things needed demonstration.

Pure and applied research

I drew a distinction between the purpose of Dooling and Lachman's study and the circumstances in which it is often cited. This highlights another dichotomy in addition to one between the arts and science. Within the scientific tradition there is the issue of how pure and applied research relate to each other and to the world of practice.

Pure research in psychology is concerned with the investigation of fundamental and relatively abstract aspects of perception and cognition, isolated from real-life contexts: psychology's basic task is to explain *how* people perceive, think, remember and so on. Cognitive psychologists build models which embody hypothesized components and mechanisms of a cognitive system. These must be consistent with known data and testable by experiment. Consequently, many studies of, for example, the reading process address themselves to the theoretical problems of a particular model rather than to the actual problems encountered by readers. In contrast, applied psychology uses the same methodologies to tackle real-life problems more or less directly ('more or less', because even applied psychology can seem extremely abstract to lay people).

Wright (1978) has explored the relationship of pure and applied research into language comprehension. She argues that both branches are interested in the connection between 'factors prior to reading' (differences in texts, subjects and reading goals) and performance measures (such as retention or comprehension). The difference lies in the nature of the connection: pure psychologists are interested in 'Theories of HOW' while applied psychologists are interested in 'Theories of WHEN'. For example, a 'pure' theory might explain how language is represented in memory, while an 'applied' theory might state that when certain kinds of questions are inserted in a text it is memorized more easily. However, some have doubted that such applied 'theories' are in fact theoretical unless linked by some general framework: Rickards (1977), for example, concluded that most research into inserted questions was atheoretical and thus impossible to integrate and apply. And Anderson and Biddle (1975), reviewing the same literature, dubbed it 'mindless empiricism'. Brian Lewis (personal communication) used the term 'dustbowl empiricism' to describe the endless succession of atheoretical experiments on this and similar educational issues. If there is no foundation for the process of systematic enquiry we are dealing not with science but what Hudson (1972) has called 'the cult of the fact'.

Indeed, Wright goes on to remark that:

'more typically in practice the contents of the Theories of WHEN box [in a diagram she provides] seem to be an accumulation of statements about the conditions in which performance is improved or impaired.' (p. 263)

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She cites the legibility research reviews of Tinker (1963) and Spencer (1969b) as examples. We have already reviewed some of the difficulties of applying such research.

A related problem is that it is very easy for research results to become detached from the conditions and qualifications alongside which they are originally presented. Most psychologists are well aware of the multi-dimensional nature of the phenomena they investigate, but there is a trade-off between different purposes of research. Frase (1973) warned users of psychological research on text that they should distinguish between three kinds of problem – theoretical, methodological and practical. There is a danger of attempting to interpret research which is primarily intended to solve methodological or theoretical problems as a source of practical advice.

In an influential book *Cognition and reality*, Neisser (1976) made a plea for cognitive psychologists to respect what he terms ‘ecological validity’. This term describes the extent to which theories of cognition account for pragmatic considerations of the subjects’ world view in addition to ‘content-free’ mechanisms of the mind. He cites Newell (1973) who listed fifty-nine different research paradigms in use at that time, fifty-seven of which were based on artificial laboratory situations. Neisser appeals to cognitive psychologists to

‘make a greater effort to understand cognition as it occurs in the ordinary environment and in the context of natural purposeful activity. This would not mean an end to laboratory experiments, but a commitment to the study of variables that are ecologically important rather than those that are easily manageable.’ (p. 7)

For an example of the easily manageable being preferred over the ecologically important, we might turn to research on educational texts. Many experiments, including some of those on ‘typographic cuing’ (reviewed in Chapter 1), continue to use literal recall as a convenient measure, although outside the laboratory the need to recall the exact words of a text is rare. Furthermore, Neisser is talking not about applied but about pure research on cognition:

‘A satisfactory theory of human cognition can hardly be established by experiments that provide inexperienced subjects with brief opportunities to perform novel and meaningless tasks.’ (p. 8)

If only one or two variables are measured it is possible to produce statistically significant data which is easy to interpret. Although psychometricians have produced methodologies and statistical techniques for handling multi-dimensional issues, they are complex and technically demanding and are less likely to give clear answers; they may also be of doubtful use in the hands of those who only half understand them. And if such studies were to use a wide variety of subjects (age-groups, cognitive

styles, educational and socio-economic groups etc) the technical problems of experimentation could be overwhelming. This is not to discount the contribution of psychologists and experimentation, but to argue that the most usable research results are those that show an awareness of their limitations and their place within a wider theoretical framework.

This view is echoed by applied linguists (eg Widdowson, 1979; Brumfit, 1980) who have similarly had to address the relationship between theoretical and applied linguistics. The way forward for theoretical linguistics was established by de Saussure's distinctions between *langue* & *parole* and diachronic & synchronic. By studying language as a symbolic system frozen in time, practical issues to do with translation or second languages could be ignored. Language could be studied in a 'pure' form undistracted by its social context. However, as soon as we need to study language as a communication system, it is complicated by human motivations and conversational roles.

This is not to say that research or scholarship must be unselective. All scholars obviously have to sort out that which is relevant from that which is irrelevant to the problem in hand. Popper (1957: 145) remarks in the course of a discussion of the nature of historical study:

'If we say that the cause of death of Giordano Bruno was being burnt at the stake, we do not need to mention the universal law that all living things die when exposed to intense heat. But such a law was tacitly assumed in our causal explanation.'

A crudely expressed 'law' like that might be disputed by biologists who might conceivably know different, or who might have a better way of putting it, but it is good enough for the historian's purpose. Putnam (1978) calls this 'interest relativity'.

At one time it was possible to talk of the 'unity of science', whereby sociology was reducible to psychology, psychology to biology, biology to chemistry and chemistry to physics. Individual fields of study are often themselves divided into levels of analysis. Linguistics, for example, is sometimes divided between various applied fields which are reducible, through semantics, syntax and phonology, to phonetics (as Figure 2.1 illustrates).

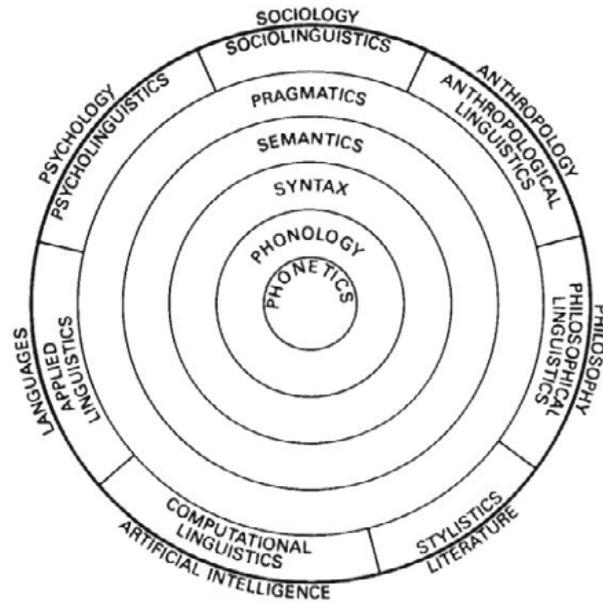


Figure 2.1 The linguistic sciences, as diagrammed by Aitchinson (1978).

There are two problems here. The first is that in order to focus their efforts on a particular level of analysis, scholars have to simplify their assumptions about peripheral matters. Those simplified assumptions may be made from a state of ignorance about other levels of analysis. That risk will always be present and calls for good interpreters or popularizers. The second problem is more fundamental: we have to distinguish between different levels of analysis within a unified world view, and different, incompatible, world views.

The unity of science view has been rejected by most philosophers of science, who talk instead about the *incommensurability* (which may be roughly translated as incompatibility) of scientific paradigms. Feyerabend (1975) likens this concept to the gestalt switching which we experience when looking at well-known ‘impossible’ figures (Figure 2.2). In both the figure and in a scientific theory, apparently immutable things may change their function or disappear altogether when viewed in a different way.

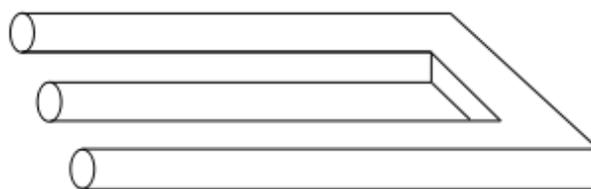


Figure 2.2 An impossible figure used by Feyerabend (1975) to demonstrate the principle of incommensurability.

The clash of incommensurable paradigms may explain the tone of the primacy of speech debate among linguists (Chapter 1), symptomatic, perhaps, of the fundamental incompatibility of the structuralist and

functionalist linguistic paradigms. Indeed, similarly intemperate language can be found in well-known paradigm clashes in other fields: when evolutionists discuss creationism, for example, or when monetarist economists discuss green politics. Where modernist graphic designers condemn symmetrical layouts as irrational, or where applied psychologists appear to dismiss intuitive knowledge, there, too, is evidence of paradigm clashes.

Paradigms

The term ‘paradigm’, used in this way to refer to systems of thought, is associated with Thomas Kuhn (1962). Kuhn defines science primarily in social terms – for him, a mature scientific discipline is a community of scholars who share a common paradigm. A paradigm is a model or pattern. It may be a theoretical statement or law, agreed within a scientific community, that anchors a field of enquiry and suggests a firm course for further study. The essence of Kuhn’s theory is that science progresses not by the steady accumulation of facts but by a succession of revolutions (or ‘paradigm-shifts’), where paradigms (and many of the ‘facts’ attached to them) are discarded in favour of new ones that are seen as better able to resolve key problems. Together with other influential post-war philosophers of science, he effectively laid to rest the popular ideal of the ultimate unity of science, and placed science firmly in the context of human activity rather than a quest for Universal Truth.

Kuhn emphasizes that paradigms rarely start out as complete systems of thinking. In fact it seems to be important that paradigms are not complete. According to Kuhn, most scientific work (what he calls ‘normal science’) consists of trying to fit previously known observations into the paradigm’s framework, or trying to make new observations which it predicts. Paradigms are valuable because they define the agenda for a discipline: they pose a series of puzzles that fascinate individual scientists and motivate them to do detailed work of the sort that would be impossible if each saw it as his or her task to build the field from scratch.

Kuhn’s ideas, concisely and persuasively written, have proved attractive to members of relatively new specialisms who are struggling for consensus. I have found him cited not only by other philosophers of science but by writers on research areas relevant to this study – for example, discourse analysis (Coulthard, Montgomery & Brazil 1981), linguistic history (Cohen 1977) and reading research (Venezky 1984). Members of such young disciplines perhaps feel challenged by Kuhn’s remark that

‘...it remains an open question what parts of social science have yet acquired any paradigms at all. History suggests that the road to a firm research consensus is extraordinarily arduous.’ (p. 15)

While not explicitly condemning the social sciences, he goes on to point out that in the absence of the focusing and unifying power of a paradigm, fact-gathering is restricted to readily available data and commonsense observation.

It is not altogether accurate, though, to suggest that the social sciences have no paradigms; cognitive psychology, Chomskian linguistics, and structuralist criticism, for example, all replaced previous paradigms in a revolutionary manner – not in the sense of sweeping them off the face of the earth, but by being incompatible with their predecessors they forced individual scholars to choose between them. Having said that, though, it should be noted that Kuhn’s remark on the paradigm-less state of the social sciences was something of an aside. Elsewhere he refers to them only obliquely and as a rhetorical contrast to the established sciences. For example (of broader interest to typographers, perhaps), he notes that technical articles are preferred to books as the communication medium within an established science, since they can assume agreement within the shared paradigm and knowledge of its facts. But:

‘only in the earlier, pre-paradigm stages of the development of the various sciences did the book ordinarily possess the same relation to professional achievement that it still retains in other creative fields.’ (p. 20)

In a postscript to the 1969 edition of *The structure of scientific revolutions*, Kuhn expresses puzzlement at the extension of his ideas to areas outside science, since he confesses that they were themselves borrowed from those fields:

‘Historians of literature, of music, of the arts, of political development, and of many other human activities have long described their subjects in the same way. Periodization in terms of revolutionary breaks in style, taste, and institutional structure have been among their standard tools.’ (p. 208)

This is certainly the way that design is taught: while a dominant paradigm is hard to discern, we do have distinct schools and periods – the Arts and Crafts, the Bauhaus, Swiss typography, and the historical tradition, for example. In certain places and at certain times a particular paradigm has dominated, and the way has been made clear for a flurry of activity within its boundaries.

Whereas for Kuhn the contrast between science and ‘immature’ social sciences is relatively incidental, Ravetz (1971) has taken up the issue in more detail. Like Kuhn, Ravetz examines science as a social activity. He seems particularly fascinated by the edges of science: pseudo-science, folk science and immature disciplines. As well as offering a detailed and, to students of typography, recognizable description of immature fields of inquiry, Ravetz also offers positive advice to those engaged in such fields,

whose ‘model of genuine science is a very specialized one, which may be quite inappropriate to their own tasks’. He points us to

‘the history of scientific inquiry in the period before the rise to dominance of “positive science”. Then, there was a clear distinction between two sorts of inquiry, “history” and “philosophy”; and they were in turn distinguished from “art”.’ (p. 372)

The terms survived well into the nineteenth century: although ‘natural philosophy’ is now ‘physics’ or possibly ‘science’, ‘natural history’ has been kept alive as the name of a museum, and the older meaning of ‘arts’ lives on in the title of the Royal Society of Arts which promotes practical skills, not poetry or painting.

Ravetz especially warns of the temptation to assume the outward pretence of the positive sciences before it is fully justified: elaborate mathematical or symbolic systems may become grotesque parodies of the realities they claim to describe. This view can be found in many discussions of applied fields of study: a typical example is Brumfit (1980) who discusses applied linguistics in these terms:

‘...a great deal of harm has been done by the enthusiasm of practitioners for inappropriate statistically-based experimental work, when discussion of a synthetic rather than analytic nature may have much greater value: there are academic dangers in formalism and practical risks in the adoption of inappropriate ritual.’

Similar views are to be found among sociologists, educational theorists and psychologists (some of whom I cited earlier in the chapter), so much so that it is fair to talk of a consensus of opinion running across discipline boundaries – although still a consensus of the minority.

Those who seek support from Kuhn’s work for the establishment of a unifying paradigm sometimes appear to assume that although the ‘immature’ social sciences may *not yet* have recognizable paradigms or are *not yet* mature sciences, the attainment of scientific status is nevertheless an ideal to be pursued. An important distinction, though, between the sciences and the social sciences is embodied in the term itself: the *social* sciences recognise the social context in which their subject of study is found. While scientists are typically removed from their subject, which may be viewable only through an apparatus or methodology, social scientists are participants in theirs. A single paradigm may be essential to scientists trying to make sense of a reality mediated by an oscilloscope, but is unlikely to satisfy the social scientist who, as a human being with complex social, spiritual and physical needs, can sense the futility of pretending the world is one-dimensional.

Ravetz proposes a substitution of terms that might help young areas of study (such as typography) avoid changing from immature sciences to mere

pseudo-sciences. He suggests that ‘research’ might be replaced by the less formalized concept of ‘history’ and ‘theory’ by ‘philosophy’.

‘It would then not be a cause of surprise or shame that effective new insights come only very rarely...and it could be recognized that an essential part of a genuine education in the discipline is a dialogue with its great masters.’ (p. 374)

This view is of some comfort to teachers of typography who traditionally engage in just such a ‘dialogue with its great masters’, focusing on key personalities whose work is catalogued and style analysed. Typographic philosophies may thus be viewable through typographic history, and may be embodied in the work of ‘masters’ (whether Aldus Manutius or Herb Lubalin) whose work is representative of a particular coherent and distinctive approach accessible through criticism and, like fine artists who copy paintings in galleries, through exercises in pastiche.⁴⁰

But while attention to the past is common among typographers and especially artists, it is rare among scientists, who typically see progress as cumulative. Feyrabend (1975) suggests that scientists, too, would do well to study the past:

‘No idea is ever examined in all its ramifications and no view is ever given all the chances it deserves. Theories are abandoned and superseded by more fashionable accounts long before they have had an opportunity to show their virtues.’ (p 49)

As if to prove his point, the same idea was expressed seventy years earlier:

‘Do you want to get at new ideas? read old books, do you want to find old ideas? read new books.’ (attributed to Robert, Earl Lytton by the *Times Literary Supplement*, October 19th, 1906; quoted by Dobson 1917)

Ravetz’s third component, ‘arts’, is also fully compatible with traditional typographic study. The term is used to describe ‘the set of principles defining the methods of any class of tasks’. The linking of history, philosophy and arts, for Ravetz, gives theorizing a goal and retains its links with the real world. It also recognizes the value of craft skills, expressed aphoristically rather in the form of ‘laws’ or theories, as providing a first generation of facts for the new discipline.

Guidelines and slogans

The communication of aphoristic, practical knowledge presents certain problems. Practical books and articles often present advice or research findings as simple guidelines. In their more general form, guidelines have been termed *slogan language* (‘form is function’ is an example of a frequently repeated typographic slogan).

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⁴⁰ Macdonald-Ross (1977) has argued for the study of ‘master performers’ as a means of arriving at generalizable principles of good design; indeed, the currently fashionable quest for ‘expert systems’ is based on the study of high-performing individuals.

Wright (1985) has been particularly critical of low-level (ie, detailed) guidelines which, applied without sensitivity to their inevitably numerous exceptions, can do more harm than good. She further points to the sheer number of guidelines needed to cover the range of problems encountered in text design, citing Hartley whose ‘Fifty guidelines for improving instructional text’ (Hartley and Burnhill, 1977b) were subsequently expanded to eighty (Hartley 1981). She remarks, ‘Why stop there?’

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In his reply Hartley (1982) suggests that guidelines are helpful to novices if not treated as inflexible rules. Indeed, his papers and books are enthusiastically sought by educators wishing to know how they can write and present good textbooks. My own concern is that guidelines should not become detached from supporting evidence. A typical guideline might say ‘Use simple language (Some name, 1979)’, without detailing those circumstances under which simple language might be misleading, or what constitutes simple language. More seriously, on following up the reference given one can find that the cited author has simply remarked, say, ‘Use simple language’. Research references have sometimes been used for persuasive purposes to lend authority to the guideline – indeed, when non-experts seek research references it is frequently for this reason.

Since guidelines are often neither detailed enough for exact application nor generalizable through a theory, they can appear to offer contradictory advice. For example, Winn & Holliday (1982) offer research-based guidelines for diagramming which separately suggest that the components of diagrams should be arranged in a left-right, top-bottom reading sequence, should be arranged to reflect the physical arrangement of the system described, and should be arranged so that graphic proximity reflects conceptual relatedness. In reality these are all good alternatives to consider when faced with a diagramming problem. Presented in guideline form, though, they can too easily become detached from their supporting argument.

In the field of typography an example of well-presented guidelines is provided by Felker and his colleagues at the Document Design Center, Washington DC (1981). Twenty five principles for clear writing and design are presented together with generous examples, a critical review of relevant research, a bibliography, and, most important, qualifications which emphasize the exceptions to the rule. When guidelines are presented as the conclusions to a sound argument or a well-documented case study, then they can indeed be useful and effective. However, there is still no unifying framework for the advice. The guidelines do not exemplify or embody a practical theory, mastery of which would enable the reader to build insight in order to tackle problems not anticipated by the guideline writers.

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In a different context (a discussion of the practical curriculum advice offered to schoolteachers), the problem of guidelines has been attributed by Anderson (1981) to a false equation of practicality with simplicity. He argues that features often associated with good practical manuals, such as simplicity, readability and the use of familiar examples, do not necessarily make researchers' advice usable. Good practical manuals, he suggests, must be sincere in their practicality: too many curriculum researchers use a rhetorically contrived appearance of practicality, either because it is expected of them, or simply to ease standards of academic criticism. In addition, Anderson argues, researchers usually underestimate both the complexity and the orderliness that lies behind the apparently chaotic (to the outside researcher) classroom situation. Practicality is not the same as simplified theory, but is related to the context of a manual's use *as it is perceived by its users*. The question is, of course: how are writers of guidelines to get at such perceptions? Anderson (a sociologist) suggests ethnomethodological techniques to model the intentions and actions of people in practical contexts. Such techniques are briefly reviewed in Chapters 5 and 8.

Earlier I discussed the relationship between pure and applied research (mostly in relation to psychology). But although psychologists might see the debate about the pure/applied distinction in terms of their real-world relatedness, to most designers *both* are in the realm of 'theory'. Far from being at opposite ends of a continuum of practicality, both pure and applied psychology are dimensions of scientific investigation, itself distinct in most designers' minds from 'commonsense' or intuitive knowledge.

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When psychologists conclude research reports related to language with practical recommendations or guidelines, they switch from a mode of reasoning with whose rules they are familiar to one they often underestimate. While following methodological conventions with precision, they risk cutting across the accumulated and, often widely shared, practical knowledge of their audience. Whereas most scientists seek universal laws and dislike exceptions, practical knowledge is value-laden and context-sensitive. Because it is very often tacit rather than articulated, it is easy to underrate.

Stefan Körner (1970), a philosopher of science, sees the distinction between science and commonsense as a matter of degree, arguing that it is not the case

'that the aims of science – prediction, explanation and mastery of natural phenomena – are foreign to commonsense, but rather that science pursues them in a more methodical manner.' (p. 39)

He goes on to suggest that

‘Commonsense thinking and the logic underlying it do not satisfy the requirement of the exactness of all attributes. Many, possibly all, of its classifications rely on the recognition of *similarities of objects to standard examples and to standard counterexamples.*’ (p. 43; my italics)

Returning to the context of curriculum advice, Ilene Harris (1981) has similarly argued for the replacement of ‘slogan language’ with what she terms a ‘case rhetoric’ in which theoretical precepts are interleaved with practical examples which build personal insight alongside intellectual understanding.

Explicit and tacit knowledge

Harris quotes Dreeben’s (1970) analysis of the problems of teacher training, with which typographic teachers and researchers might identify:

‘...there probably exists enough individual knowledge and experience stored in individual heads to provide the basis for sophisticated technologies – were that knowledge and experience ever brought together, codified, tested for efficiency and communicated to teachers both in training programs and on the job.’ (p.212)

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This wistful longing to encapsulate knowledge in objective form is at the heart of all applications of the scientific method to practical areas, and is exemplified by current proposals to apply computer expert systems to typography (Hewson & Lefrere 1986; Rivlin 1987). But it could be argued that all this ‘individual knowledge and experience stored in individual heads’ is what *constitutes* a technology. The scientific method is a system of knowledge which, even if it started as a creative intuition or hunch, is publicly demonstrable by reasoning and experiment: the method as well as its outcomes are supposedly open to question and debate (‘supposedly’ since the extreme technicality of many scientific processes places them out of the lay person’s reach). But although designers can draw on scientific theories from time to time, the solving of complex problems stems from a different kind of knowledge that, although possibly beyond analysis, can nevertheless be effective.

Michael Polanyi, himself a scientist, developed this notion of ‘tacit’ knowledge in a series of books and lectures. He argues that it is not only as real and valid as explicit knowledge but that it forms the root of all knowledge, citing numerous examples of the intuitive nature of scientific discovery:

‘Let us recognise that tacit knowing is the fundamental power of the mind, which creates explicit knowing, lends meaning to it and controls its uses. Formalization of tacit knowing immensely expands the powers of the mind, by creating a machinery of precise thought, but it also opens up new paths to intuition; any attempt to gain complete control of thought by explicit rules is self-contradictory,

systematically misleading and culturally destructive. The pursuit of formalization will find its true place in a tacit framework.’ (Polanyi 1969: 156).

Another important discussion of the problem of theory and practice is by Ryle (1949), who addressed the distinction between ‘knowing that’ and ‘knowing how’. Ryle’s ultimate concern is rather more fundamentally epistemological than our present one, to destroy what he terms ‘the dogma of the ghost in the machine’: that is, the mind/body distinction of Descartes. In doing so he argues that practical skills and actions exhibit intelligence in exactly the same way as mental skills. According to Ryle, Cartesian dualism implies that thinking (by the mind) and doing (by the body) are separate operations, that thinking must precede doing and that intelligent practice exhibits a prior mental process. He argues instead that when we describe an action as intelligent we are not discussing a mental process of which the action is just an outcome, but we are discussing the action itself. Indeed, turning the tables on the ‘intellectualist tradition’, Ryle suggests that arguing logically is itself a practical skill:

‘Rules for correct reasoning were first extracted by Aristotle, yet men knew how to avoid and detect fallacies before they learned his lessons...They do not plan their arguments before constructing them. Indeed if they had to plan what to think before thinking it they would never think at all.’ (p. 30)

Ryle’s polemic against the intellectualist tradition is attractively democratic – each of us (‘the boxer, the surgeon, the poet and the salesman’) applies similar intelligence to our particular tasks. But what does this intelligence consist of? It does not simply mean performing well – clocks and performing seals do that. Ryle argues that intelligence is instead to do with responsibility for effective performance:

‘To be intelligent is not merely to satisfy criteria, but to apply them; to regulate one’s actions and not merely to be well-regulated. A person’s performance is described as careful or skilful, if in his operations he is ready to detect and correct lapses, to repeat and improve upon successes, to profit from the examples of others and so forth. He applies criteria in performing critically, that is, in trying to get things right.’ (p. 29)

In effect, Ryle is suggesting here that the critical process is the essential mark of intelligent performance. Indeed, it could be said that criticism (or feedback) is at the heart of *any* successful performance. It is at the heart of behaviourist Stimulus-Response psychology, and it is a basic concept in systems theory where unintelligent systems are seen to maintain stability through feedback mechanisms (a thermostat is a typical example). In fields closer to the present enquiry, Kulhavy (1977) has discussed the role of feedback in instruction, and Eco (1976) applies a feedback model to semiological communication. And students of graphic design will confirm from experience that design is easier to criticize (in the non-pejorative sense of the word) than to prescribe.

Whether or not there is a dualism of thought and action is not the issue to us, but there is surely a sense in which the criteria referred to by Ryle can be asked to stand independently from particular actions. To detect lapses or to profit from the example of others implies the existence of some sort of paradigm performance, or set of rules, with which actual performances are compared, although this may remain in the tacit domain. The critical loop (or feedback) may not be articulated in everyday practice by the boxer, surgeon or designer, but that is not to say that it cannot be articulated or might not benefit from being articulated.

Holistic thinking

Polanyi, from his particular perspective, also recognizes the critical process as central to the growth of both tacit and explicit knowledge. He uses the term ‘physiognomy’ to refer to situations which can be recognized but not described; the metaphor is that of the infinitely varied instances of the human face which we can identify without being able to articulate. Polanyi argues that defining a physiognomy (which in our own terms might be a design problem, a magazine page or a typeface) will involve two stages: a *focal* awareness of its particulars and a *subsidiary* awareness of those particulars in relation to their participation in the whole. Using a series of examples from ordinary life and science, he argues that most ‘knowing’ involves an alternation of focal and subsidiary awareness, analysis and integration.⁴¹ Interestingly, Polanyi cites the use of the term ‘aesthetic recognition’ by Pantin (1954) in relation to the recognition of species by zoologists. Pantin’s fascinating paper describes how biologists in the field

‘...cannot help being struck by the contrast between the way one identifies... animals in the museum and the way it is done in the field’.

In the case of his own speciality (a species of small worm), it is not possible in the field to analyse specimens feature-by-feature against a recognition checklist. Instead,

‘if, when we are collecting *Rhynchodemus bilineatus* together, I say “Bring me any worms that sneer at you,” the probability of your collecting the right species is high.’ (p. 593)

Among the more theoretically inclined of graphic designers the term ‘aesthetic’ has become somewhat discredited, with its implication that one personal preference is as good as any other. Pantin’s use of the term, though, suggests that it is more sensibly used to describe the feeling of recognizing the physiognomy of, in the typographic context, a well-formed letter or a problem solved. Unaccompanied by an articulated critical process

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⁴¹ Polanyi carefully distances himself from Ryle’s ‘absurd’ conclusion to ‘his [Ryle’s] powerful arguments’. Instead of dismissing dualism out of hand, Polanyi prefers to ‘dispose of the Cartesian dilemma by acknowledging two mutually exclusive ways of being aware of our body’.

though, designers can be easily deceived by what we might term aesthetic fallacies – false symmetries and alignments, for example.

This holistic style of thinking need not be accepted uncritically. Although the context was somewhat different to the present one, in the course of an attack on historicist and Utopian social policy Popper (1957) makes an important distinction between two kinds of ‘wholes’: first, the literal totality of all the components of a system and their relations; and, second, certain properties of a system which make it more than the sum of its parts – the *gestalts* of that school of psychology. The fact that the second sort of whole can be studied scientifically does not mean that the same can be said of the first sort. For Popper, science – indeed, all description – is inherently selective. *Gestalts*, although holistic properties, are not the only properties, or even the only holistic properties, of systems. Popper cites melody and rhythm as examples of co-existing holistic properties in music. The lesson for typographic theory is that we can expect to find similarly co-existent holistic properties of typographic displays which, although they may be hard to reconcile in terms of explicit theory, may be as easy as music for readers to discern and designers to create, using tacit knowledge.

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The specialization of scholarship

We may reduce many of the issues raised in this chapter to two key problem areas: one is *the specialization of scholarship*, with its distinctions between disciplines, between pure and applied research, and between systems and components; the second is *the communication of practical advice*, with its associated problems of balancing theory, guidelines and examples, and establishing a critical method.

The scholar’s job is to *analyse* and categorize messy real world situations into sub-problems that can be handled by detailed methodologies. Conversely, the user of scholarship has to *synthesize* the different views and theories into his or her tacit understanding. So although an analytic approach may be necessary, frequent reference must be made to the holistic context of each sub-problem if the research is to be useful.

Holistic overviews are themselves selective, though, in their view of the world, representing not the totality of all sense-data in a system, but only those data *relevant* to a particular theme or paradigm. Thus the psychologist, the philosopher and the linguist all claim to study the structure of knowledge at various different levels of analysis, but each takes a distinctive holistic quality as primary.

A problem for the typographer seeking a rationale is that commitment to a single scholarly paradigm, whether psychological, linguistic or otherwise, seems unduly restrictive. A design problem (or a design product) derives

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constraints from a range of sources and so is likely to have more than one physiognomy – like the impossible figure in Figure 2.2. While a goal of this investigation is to point towards a critical method, we must not expect to find a single paradigm. Instead, I shall be discussing a range of alternative critical paradigms (which I shall term ‘structures’) each deriving from a different source of design constraints. It will be suggested that the nature of designing, and interpreting design, is to attain the skill of multiple (as distinct from selective) perceptions, and to balance or harmonize their competing demands.

Here it may be objected that I am drawing an inappropriate parallel between the way that scientists view communication and the perceptions of ordinary people trying to communicate. After all, while scientists construct *formal* languages to make ideas publicly accessible, in everyday conversation we use *natural* language, simultaneously drawing on linguistic, logical, social and aesthetic resources in an automatic way that does not call for an explicit critical method. However, the relationship between writer and reader is asymmetric in a way that the relationship between speaker and hearer is generally not. In a typical spoken conversation, both speaker and hearer can use natural language. Written language, though, differs from spoken language in its provenance as well as its channel. In its printed form it is typically mediated by editors, designers, printers and others. Although the result may be interpreted ‘naturally’ by readers who are unaware of the production process, the assembly of printed texts is a deliberate, planned formal process in which a range of competing demands and constraints must be carefully balanced.

But it is not just at the producers of text that this multi-faceted critical method would be aimed. Classical rhetoric not only taught orators to make persuasive speeches, but it also enabled listeners to spot logical tricks and biased arguments. In the same way, a critical method for typography is not just for the refinement of technique, but might also represent an extension of literacy for readers. The greater the critical awareness of all aspects of text, the greater chance readers have of exercising control over their reading in terms of both strategy and outcomes. Ivins (1943), with typical insight, linked the critical awareness of media (printed illustrations, in his case) to a more general critical awareness:

‘In view of all this [evidence he has just presented] the importance of being able to recognise the technique or process by which a printed or otherwise precisely duplicable image was made becomes obvious – for this knowledge enables us to discount or make allowances for the limitations, the blind spots, the distortions, implicitly and unknowingly introduced by techniques and processes into duplicate images and their testimony about the world. These implicit distortions are a most important part of the unconscious, unphrased, common assumptions of any society, which basically determines its ideas and action. Very few people ever

realize the extent to which “objective facts” as known by us are actually no more than peculiarities of our instruments of observation and record.’ (p. 143)

In any case, there is something to be said for treating scientists and lay persons, users of formal and natural language respectively, in the same way. The psychologist George Kelly (1955) has recounted how he developed the concept of ‘man the scientist’, central to his theory of personal constructs. His appointments during a typical working day would alternate between his psychotherapy patients and his post-graduate students. He came to realize that the patients were asking much the same sort of analytical questions about their personal relationships as the students were asking about their projects. By providing them with the Repertory Grid technique with which to analyse their perception of personal relationships (the same analytical tool he recommended to his students), Kelly enabled his patients to come to a more objective understanding of their problems from the scientist’s critical distance.⁴²

I have suggested that, in this context at least, the same Kuhnian paradigms might serve practical as well as scholarly purposes. But where do paradigms come from? According to Kuhn:

‘Paradigms gain their status because they are more successful than their competitors in solving a few *problems that the group of practitioners has come to recognise as acute.*’ (p. 23, my italics)

Although Kuhn means ‘practitioners’ to refer to scientists, in the absence of a science we might adapt his argument to mean those who are most deeply engaged in the field of enquiry, or indeed the field of practice. In effect, Kuhn is suggesting that paradigms grow from a *critical tradition*.

The term ‘critical tradition’ is apt, implying both a historical dimension and an evaluative approach. The historical dimension informs about possible connotations of candidate solutions to a design problem, and provides models for particular genres of text. Evaluation is suggestive both of minimum standards (catastrophe avoidance) and an ideal or typical model against which design solutions may be measured, and towards which guidelines might point. The model of typographic communication proposed in Chapter 5 is directed towards this end. First, however, I shall return to consider linguistic aspects of typographic study in more detail, since, as became apparent in Chapter 1, it appears to be the most likely source of insight. Whatever else typography is, it is a quality of language.

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⁴² Kelly’s technique has been applied across a very wide range of subject areas, including several relevant to this study – for example, study methods (Thomas & Harri-Augstein 1980), and the expressive properties of type design (Bartram 1982).

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Arbitrariness and linearity: de Saussure's 'basic principles'

I concluded Chapter 1 by identifying the field of 'discourse studies' as a possible home for typographic theory. Although interdisciplinary, discourse studies is essentially language-based. This chapter therefore explores some further aspects of the relationship between typography and language. In the first half of this chapter I shall discuss some aspects of the reconciliation of the verbal and the visual, before moving on to discuss the linearity of verbal language, and the effect on the writer-text-reader relationship of freeing readers from that linearity. A key dichotomy is identified, between writer-control and reader-control of the order of presentation, and this is discussed further in Chapter 4.

The criteria for languageness: arbitrary, segmented, systemic and linear

In addition to the twin doctrines of the primacy of speech and the sentence boundary, discussed in Chapter 1, de Saussure presents us with two formidable barriers to the application of linguistic principles to the study of visual aspects of verbal language:

'the linguistic sign...has two primordial characteristics. In enunciating them I am also positing the basic principles of any study of this type.' (de Saussure 1916/1974: 67)

The first principle is the *arbitrariness* of the bond between the signifier and the signified. Arbitrary signs are distinguished from *iconic* (or *motivated*) signs. 'Cat', 'chat' and 'gatos', for example, are arbitrary signs, since they do not resemble any aspect of real cats. 'Meow' and 'miao', being motivated by onomatopoeia, are usually cited as exceptions which prove the rule. They are said not to be strictly linguistic because they can be interpreted by direct reference to experience rather than through knowledge of the language.

De Saussure's second principle is the *linearity* of the signifier (that is, the language 'surface'). Most linguists are primarily concerned with 'syntagmatic' relations between components: the relationship of each word to its predecessors and successors in the linear sequence. Those text linguists who take sentence linguistics as their model are similarly

concerned with the relationship of sentences and paragraphs within the linear series.

These two principles seem to be a necessary precondition for the linguistic method, which seeks to reveal *systematic* relations between *clearly segmented* components. They are clearly important if language is to be seen as an abstract or virtual system, existing apart from its context of use. And they are among the most important of the 'design features' of language, as distinct from other sign-systems, listed in linguistics textbooks (for example, Hockett 1958). But although that is the preferred view of many linguistic scientists, few real utterances actually conform to these principles. Unscripted speech, for example, is usually accompanied by motivated signs (such as gestures, expressions, and changes of pitch) which signal the frequent false starts, topic switches and grammatical 'errors' that result from its time-bound linearity (Tannen 1982).

Ironically, in view of the insistence on the primacy of speech, it is only really possible to find actual utterances which conform to the linguistic ideal in the form of printed continuous prose which, being mechanically produced, is formed from a limited set of identical characters. In its usual printed form, prose is verbal, linear, clearly segmented and typographically neutral. It is 'non-visually informative' in Bernhardt's terms, 'unmarked' in Vachek's, or 'arbitrary' in de Saussure's. And the systematic ideal is realized through the application of spelling rules and the opportunity writers have to carefully revise their sentence structures to ensure their grammaticality.

A number of important practical issues are at stake when we determine whether typographic features can be handled within a linguistic framework. In spite of the obvious differences between written and spoken utterances, verbal language can still be recognized as having an existence apart from its mode or channel of transmission. Even stripped of the intonations available in speech and the graphic emphasis available in writing, its segmented, arbitrary and linear nature makes it not only translatable, but transcribable in a variety of media. If graphic features transgress on these essential points, we would have to find some other basis for a systematic analysis on which to base what Twyman (1982) called 'graphic translatability'. A topical and pressing issue is how to store graphically organized information (for example, timetables, or diagnostic charts) in electronic form in such a way that it can be accessed in formats as different as printed paper and electronic screens.

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Language or paralanguage?

Linguists traditionally deal with segmental aspects of language – the segments themselves (phonemes, morphemes, words and sentences)

and the rules for their combination. Since most actual utterances contain features which are not strictly verbal, are iconic in some respect or not clearly segmented, but which contribute both to meaning and to structure, linguists have introduced the term 'paralanguage'. Some have proposed that paralanguage has a counterpart in written language: Bolinger (1975: 478), for example, refers in a diagram to 'paragraphology'.

In spoken language, pointing, winking, waving, shrugging and smiling are all uncontroversially paralinguistic since they are not phonological in nature. Features that are phonological, such as variations of stress, rhythm, tone and pitch are usually deemed 'prosodic', or 'suprasegmental'. This terminological problem need not concern us too much, though, since the distinction between prosody and paralanguage – the one being articulated in sound, and the other not – is easier to make in relation to speech than it is in relation to written language. In written text, everything is to a degree visible (although 'prosody', used in its literary sense of metrical structure in verse, is only as visible as English orthography is regular – ie, unreliably so). I shall therefore use only the term 'paralanguage'.

It could be argued that the term 'suprasegmental' is rather misleading, given that both prosody and paralanguage can be used to emphasize the segmentation of language units – generally at the discourse level. For example, in many variants of English, changes in pitch mark the relative position of words within the sentence; and parenthetical remarks are normally signalled as such by a change in tone of voice.

Lyons (1977) reflects this point by distinguishing between two kinds of paralanguage, *modulation* and *punctuation*. I will straight away substitute the term *segmentation* for 'punctuation', since Lyons appears to be using an everyday term in a special technical sense. Confusion could arise since punctuation, in its everyday sense, could be said to have a modulating as well as a segmenting function.

Modulation describes the way in which the meaning of an utterance may be coloured or emphasized by tone of voice, facial expression or gesture. For example, a sentence like 'Don't be boring' may be taken as an instruction, an insult, a mild protest at an idea rejected or a joke, depending on how it is said. In written language we can achieve a similar, but still ambiguous, effect by italicizing a word or adding an exclamation mark ('Don't be boring!'). Advertising copywriters have developed this use of punctuation to a fine art: the period after short headlines, single word sentences, frequent paragraph breaks with excessive indentation. These 'score' our reading of the advertisement (the musical term is suggested by Nash, 1980, and discussed further in Chapter 4) in imitation of an intimate television voice-over – 'Kleeno. Because you care.'

Our writing system has normally been considered inadequate, though, by linguists wishing to transcribe speech in its full paralinguistic richness. They have had to invent special notations to give some impression of rises and falls in pitch and the relative stress given to parts of a sentence. It is possible to use italics and bold type to add some vocal quality to writing but only to a strictly limited degree. At the discourse level, though, typographic modulation is common. Textbook designers, for example, often specify different typographic 'voices' to distinguish between, say, the main text, quotations, captions and study guidance.

Segmentation describes the marking of boundaries in spoken or written language. In speech, this may be done with pauses, with gesture or with tone of voice. In writing, boundaries may be represented by space, rules or punctuation marks. At levels higher than the sentence (for example, sections of a book, or when the subject of a conversation changes), boundaries are also typically marked by the use of 'metalinguage' – language whose function is to structure or monitor the discourse as a whole. Words like 'Well' (in speech) or 'Introduction' (in books) are metalinguistic. In writing, metalinguage is itself often signalled typographically: headings, for example, function because of the way they look as well as through what they say.

Many of those who have directly compared speech and writing comment that, whereas cohesion and structure is achieved in speech through paralinguage, in writing it is established through a more elaborate and formal syntax (Cook-Gumperz & Gumperz 1981; Chafe 1982; Tannen 1982). Cook-Gumperz & Gumperz have studied the implications of this difference for children's 'initiation' into literacy. They comment that

'children's use of intonation is an *essential*, rather than [a] background or additional part of the information signalling load for a message' (p. 101, their emphasis)⁴³

and that

'For children, the essential change between written and spoken language is the change from the multi-modality of speech to lexicalized discursive sequences of written language.' (p. 99)

Interestingly, Cook-Gumperz & Gumperz go on to report that children compensate for the lack of paralinguage and prosody in writing by employing *graphic* means: heavy and dramatic punctuation,⁴⁴ the free mixing of pictures and words, and the unconstrained use of space and

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⁴³ This should be clear from the fact that in the adult context we generally regard speech with exaggerated intonation as childish or patronizing.

⁴⁴ However, Baldwin & Coady (1978) reported that children up to the fifth grade often ignore punctuation when *reading*.

writing direction. Typographic and spatial features may, it seems, be more 'natural' than we normally think.

Not surprisingly, since the prefixes 'para-', and 'supra-' imply borderline status, linguists disagree about how exactly paralinguage should be handled and which features should be included. Crystal (1974) represents the liberal view, arguing that

'any vocal effect which can be shown to have a systematic, shared, contrastive communicational function is by definition part of the over-all sound system of a language, and thus linguistic.' (p. 280)

Once one leaves the securely segmented world of phonemes and morphemes, though, one encounters extreme difficulty in discriminating between linguistic and non-linguistic noises (or marks on paper, presumably). Crystal therefore suggests a *scale* of linguisticness. At the 'most linguistic' end of the scale are features which are 'most readily describable in terms of closed systems of contrasts' and therefore 'relatively easily integrated with other aspects of linguistic structure (particularly syntax)'. At the other end of the scale would be features which may be 'relatively indiscrete' or have 'a relatively isolated function' and so 'seem to have little potential for entering into systemic relationships'.

In the context of semiology, Eco (1976) similarly suggests that

'The universe of visual communication reminds us that we communicate both on the basis of *strong* codes (such as language) and indeed *very strong* ones (such as Morse code) and on the basis of *weak* codes which are barely defined and continuously changing...' (p. 214)⁴⁵

To determine whether we are dealing with language, paralinguage, or something in between, we can perhaps best assess the linguisticness of typography by considering each of de Saussure's basic principles in turn.

Arbitrariness

Crystal's concept of relative linguisticness is reinforced by an examination of the arbitrariness criterion. This is the criterion by which Bolinger (1975) seems to exclude graphic devices from the linguistic domain when he refers to 'paragraphology'. (His point is made only in the form of a diagram, so his reasoning is not made very explicit.) Although one might have expected such examples as italicization or underlining, which seem directly analogous to intonation in paralinguage, he instead cites punctuation marks and mathematical signs, on the grounds that they are interpreted directly rather than by their equivalence to a phonological feature.

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⁴⁵ However, a code that is weakly defined and subject to change seems to stretch the meaning of 'code' rather far. A basis for inference that happens to be shared by more than one person need not constitute anything as formal as a 'code'. The distinction between coding and inference is discussed further in Chapter 5.

Punctuation indeed seems paralinguistic – not for that reason but rather because one of its functions is to indicate how sentences should sound. According to one view of punctuation, the various stops mark pauses of varying length, or the use of exclamatory or interrogative intonation.⁴⁶

Mathematical signs are also a debatable example because what distinguishes them from language is not their phonological status. Considered separately (rather than in combination, when they can be diagrammatic), they are often simple alternative representations of words ('2+2=4' is an alternative transcription of 'two plus two equals four'). While it is true that they do not correspond to phonological features at the level of the phoneme, they do at the level of the word. Both 'four' and '4' are pronounced *fʊə*'

Westcott (1971) disputes the arbitrariness criterion altogether, not only in relation to written language. For example, he cites numerous morphological examples ('longer' is longer than 'long', and 'longest' is longer than either), and syntactic examples (the normal subject-verb-object order represents the actual order of transitive events). He also lists a range of different kinds of iconism in writing (Table 3.1). Similar examples are cited by other writers on this theme (for example: Martin 1972; Lotz 1972).

→	pictogram
?	ideogram (but see footnote, previous page)
\$	logogram
pp (meaning 'pages')	morphogram (the second 'p' only)
O in 'IOU'	homophonic phonogram
&	syllabic phonogram (when it appears in '&c', meaning 'etc')
,	prosodic phonogram (when used to indicate a pause)

Table 3.1 Categories of iconic symbols in the English writing system (adapted to table form from Westcott 1971).

Whereas iconicity and motivation, two terms used as the opposite to arbitrariness, are usually regarded as synonymous in relation to spoken language, Westcott's examples suggest that in written language it might be useful to distinguish between them. This is because ink offers the possibility of a much more literal iconicity than air. Written texts can contain not only traditionally-defined motivated words (like 'meow'), and motivated graphic effects like emboldening for emphasis, but also iconic displays (that is,

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⁴⁶ According to Husband & Husband (1905: 13), at least two punctuation marks owe their shape to abbreviations of words. If this is the case, then they can lay claim to linguistic, not paralinguistic, status. 'It is said', say the Husbunds, 'that the question mark originated as the first and last letters of "Querio" placed one above the other. The "o" becoming in time a dot.' They suggest that the exclamation mark (or 'note of admiration' as it was once called) is a similar development from 'Io' (joy).

pictures or symbols) which are interpreted more or less directly, not via the (supposedly) phonetic writing system. It is the latter that Bolinger picks out as paralinguistic.

It is possible to exaggerate this distinction, though, since while it may be pedagogically convenient to give children a working model of writing as a phonetic system, it is not wholly phonetic in practice, as Bolinger (1946) himself demonstrated in an earlier paper on what he termed 'visual morphemes'. Since mature readers have little difficulty in distinguishing between differently-spelled homophones, such as 'meat' and 'meet',⁴⁷ it is obvious that it is not only mathematical symbols that are understood directly from the written surface without the need for phonological equivalence. Besides the usual 'pair'/'pare'/'pear' examples, Bolinger cites the use of '-or' as a suffix of prestige, citing attempts to upgrade professions such as 'advisor', 'expeditor', and even 'weldor'. In an earlier incarnation of the same debate, Henry Bradley (1928) cites a number of similar examples, including the attempt of the compilers of the Oxford English Dictionary to determine whether 'grey' or 'gray' is correct:

'Many of the replies, especially those from artists, were to the effect that the writers apprehended *grey* and *gray* as different words, denoting different varieties of colour.'⁴⁸

Bradley suggests that one of the consequences of the partly ideographic nature of writing is the divergence of written and spoken language. As a lexicographer he was aware that new 'graphic' words can be readily constructed from Greek or Latin roots, with little regard to their pronunciation:⁴⁹

'For these words the normal relation between alphabetic writing and speech is simply reversed: the group of letters is the real word, and the pronunciation merely its symbol.' (Bradley 1928: 178)

That writing is treated as ideographic by readers is confirmed by psychologists, who have long debated whether written symbols need to be recoded into a phonological form before they can be understood. Reviewers

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⁴⁷ It is ironic that the distinction between *aural* and *oral* can be neither articulated orally nor detected aurally.

⁴⁸ The converse of such observations is that many (iconic) pictograms are culturally biased (Mangan 1978) and are thus arbitrary to those from other cultures. For example, when using a guide-book with numerous pictographic symbols, we often have to look them up in a key in much the same way as we look up unfamiliar words in a dictionary. Their iconic origins may only become apparent after we are aware of their intended meaning. And Baron (1981) reports that iconicity is a surprisingly unimportant factor in the learning of sign-languages for the deaf, autistic or mentally retarded.

⁴⁹ The best examples are found in the multi-syllabic compound words coined by chemists, which can be as complex as the chemical compounds they denote. The word 'syntagm', used later in this chapter is another example of a graphic word with no obvious pronunciation in English. Although Wade Baskin's translation of de Saussure (1916/1974) uses the word 'syntagm', it does not appear in my dictionary. Some take 'paradigm' as a guide and pronounce it 'syntam', others say 'syntagum', while most, I suspect, treat it like Polish names in a newspaper report – we note their graphic shape but don't actually attempt to pronounce them.

(such as Massaro 1979; Baddeley 1979, 1984) have reported that subvocalization is not a necessary stage in the fluent reading of relatively easy sentences, although sometimes used for complex comprehension tasks. This, Baddeley argues, is because subvocalization helps retention in short-term memory by means of what he terms the 'articulatory loop' (analogous to an audio-tape loop that can be instantly replayed for checking). However, Baddeley & Lieberman (1980) also propose an equivalent sub-system for visual information: the 'visuo-spatial sketch pad' and Kleiman (1975) suggested a model that contains both a visual and a phonological store. Although there is still some disagreement at the sentence level, there seems to be agreement at the word level that, although sometimes used by readers, phonological equivalence is not in itself a criterion for a readable symbol. The current view is fairly represented by Kollers (1985: 410) who remarked:

'The linguist's view of reading as requiring phonological mediation might be said to imply that vision is dumb but hearing is smart ... This claim cannot be taken seriously any longer, and the wonder is that it was taken seriously for so long during the 1960s and 1970s. Are faces, scents and music recognized by finding their surrogates in speech?'⁵⁰

Levels of analysis: letters, words, paragraphs

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It is also worth noting that the concept of writing as a completely phonetic transcription of speech is a mistake that can only be made by users of alphabetic writing systems such as our own. The inadequacy of that assumption must be obvious to the Chinese, whose own writing system is not phonetic, and who, having recently implemented major changes in the way their language is romanized, must be only too aware that alphabetic graphemes are but a crude approximation of phonemes.

Moreover, most historians of writing place pictographic or ideographic systems prior to phonetic ones (for example, Gelb 1963; Diringer 1962). Although our evolutionary perspective may lead us to conclude that the earlier systems were therefore proto-stages in the development of the all-conquering alphabet, they can hardly have been unfunctional – indeed, they were used for centuries. The Chinese experience is that there are trade-offs between the simplicity of the phonetic method and the multi-lingual comprehensibility of the ideograph. Indeed, Harris (1986) has argued that writing was developed because its *independence* from speech gave it certain advantages:

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⁵⁰ An interesting and perceptive variation of subvocalization is mentioned by IA Richards, who observes that the visual image of words in poems is accompanied not only by an auditory image but also by 'the image of articulation – the feel in the lips, mouth, and throat, of what the words would be like to speak' (Richards 1926: 119). The related issue of oral and silent reading is discussed further in Chapter 4.

'Hence it is particularly perverse of modern scholarship to present progress in human written communication as consisting in working towards devising one system, namely the alphabet, which was an improvement over its predecessors in being specifically tied to pronunciation.' (p. 119)

The alphabetic system obviously does have a phonetic basis, but its real advantage is its economy of symbols: something modern linguists, with their spectrograms and computers, might not have achieved. Our own limited alphabet provides an approximate phonetic system while preserving etymological clues about word origin and meaning, and enabling the exploitation of printing with moveable type. The earlier Chinese and Korean inventions of moveable type (McMurtrie 1937) were not destined to last, given the multiplicity of characters in their writing systems.

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It may be that the scope of the arbitrary/iconic distinction is *relative* to particular levels of linguistic analysis. Indeed, Westcott (1971: 426) suggests that

'iconism is a relative rather than an absolute characteristic of any communication system, language included. As regards iconism, then, the only realistic question we can ask about a given form is not "Is it iconic?" but rather "How iconic is it?."

If the existence of limited sets of highly iconic signs (such as pictograms) simply exploits the way we normally read, why should there be any problem in analysing a sentence which contains a pictogram, say, of a ☎ instead of the word 'telephone'?⁵¹ That pictograms are out of bounds is understandable only if we are looking for systematic relations between language components *within* the word (that is, phonemes and morphemes). Above that level it seems irrelevant how particular words are graphically rendered, so long as they are comprehended in an equivalent way by readers. This is the view taken by Trager (1974) who, although somewhat uncompromising with regard to the primacy of speech, is prepared to accept symbols as writing if they constitute

'a systematic representation of linguistic elements – specific morphological (words, phrases) or phonological (phonemes, syllables) items.' (p. 380)

In practice, it should be added, there are limits to this. Firstly, because there is a strictly limited vocabulary of symbols or formulaic pictures which we can rely on others to understand as reliably as if they were words; and, secondly, because many words contain grammatical as well as lexical information (that is, 'inflective' information about case, tense and so on). In practice, pictograms can most reliably substitute for words in what

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51 The rebus – the use of pictograms to indicate the sound of the name of the thing depicted rather than its meaning – is regarded by historians of writing as an important transitional stage between ideographic and phonetic writing systems. I suspect, however, that the fact the rebus is now largely confined to the status of a curiosity indicates just how non-phonological the reading process has become. The rebus principle can be demonstrated with letter-games where we are meant to say the letters and listen to the sounds they make: for example, U R N NML, I M A UMN BN (You are an an-im-al, I am a hu-m-an be-ing).

Quirk *et al* (1985) call 'block language' – single word captions, headings and labels – as distinct from sentenced language. For example, while some Open University textbooks use the words 'audio-cassette' or 'reading' to draw attention to links between the main text and supplementary course components, others substitute directly-equivalent icons of audio-cassettes or televisions: 

The word level may also be significant to historians of writing, who discriminate between the different levels of analysis at which writing can display language. Harris (1986) argues that, since it is more likely that the progressions from pictographies to syllabaries to alphabets were partial rather than total revolutions, these writing systems must have something in common:

All three are equivalent at a linguistic level of great practical utility, but for which we have no current linguistic term: and this is, significantly, because modern linguistics insists on talking about language in terms of hierarchies of discrete units. The nearest approach to what we want would be to call it the level of "*word identification*".' (p. 116, my italics; Harris puts quotation marks around the term to indicate its disputed status among linguists.)⁵²

If pictograms can only be treated as words, more elaborate iconic displays such as pictures might perhaps be viewed as linguistic components at a higher level of analysis: as equivalent to paragraphs or other verbal segments larger than the sentence. Indeed, Eco (1976) suggests that the verbal equivalent of an iconic sign

'(except in rare cases of considerable schematization) is not a word but a phrase or indeed a whole story.' (p. 215)

A picture of, say, a horse, is at a much greater level of particularization than the word 'horse': it shows, for example, a black horse galloping, or a white horse standing still.⁵³

In such cases, however, the image alone may be insufficient for its own interpretation. Indeed, Gombrich (1960) argues that no pictorial image gains the status of a 'statement' unless an explicit reference is made to what it is supposed to represent. In the case of propaganda photographs of alleged war atrocities, for example, it is the false captions not the photographs which lie. Barthes (1977) uses the term 'anchorage' to

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⁵² This view is rather spoilt, though, by the fact that the universal use of word separation was apparently a seventh or eighth century innovation (Saenger 1982). In any case, an alternative phrase might have been 'concept identification', since a clear notion of the 'word' may not predate literacy, but may instead be a consequence of it. According to Goody (1977), some modern societies where literacy is not fully established do not have a concept of the word.

⁵³ The greater level of particularization of pictures points to an essential difference between pictures and pictograms which is reflected in their normal graphic treatment. The modern pictograms typically found in airports and travel guides are intended to convey generalities of the same order of abstractness as words. Their characteristic graphic neutrality is perhaps the most significant aspect of their invention by the Isotype Institute (Neurath 1936).

describe the relationship of pictures to captions or other accompanying verbal language: most pictures are capable of several interpretations until anchored to one by a caption. One way to handle the picture-caption relationship is to regard them as a single textual unit (or, at least, as tied units in the manner of a noun phrase, or a compound word). Garland (1979), who classifies components of diagrams, significantly includes 'caption' as an integral characteristic.

We may take it, then, that iconic forms (or even iconic qualities of verbal forms – display typefaces with special associations, for example) need to be welded in to the context, or overall cohesive structure, of a particular text. But this is no less true of verbal components of texts: words, and even sentences, however well-formed, are meaningless in isolation from a context. The experiments of Meyer (1975) showed that even paragraphs can be interpreted in different ways according to the context in which they are found. However, it is rather more of a challenge to achieve such cohesion in the case of typographic, pictorial or diagrammatic displays. Whereas prose is submitted for publication in the order in which it is to appear, illustrations are generally submitted separately and integrated (if at all) at a later stage of text production over which the writer traditionally has little control. Some implications of this will be noted in later chapters – in particular, the need for closer integration of writing and design processes will become apparent (Chapter 9), and the effect of adopting the page or double-page spread as a 'linguistic' unit will be noted (Chapter 7).

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The segmentation problem

It is apparent, then, that the strict arbitrariness criterion can be circumlocuted to some degree. More central to the linguistic model than arbitrariness is the ability to identify systemic relations amongst the data (that is, samples of language or typography). This in turn would seem to depend on the data being *clearly segmented at the appropriate level of analysis*, since mainstream linguistic science relies on a distinction between an inventory of components (at the sentence level, the lexicon) and rules for their combination (the grammar).

Seen from this perspective, iconicity and motivatedness only become problematic to the linguist when they prevent such segmentation. For some typographers that might be the end of the matter, since their task is simply to render an author's linear string of words and pictures in an acceptable but still linear form, perhaps embellishing the text with a moderate amount of, for example, italicization, emboldening, or colour. But although all typographers start with segmented matter (words, lines, pictures and so on), many take the opportunity to break out of the linear string to use both dimensions of the page – in Twyman's (1982) terms, to use extrinsic

features of the composition system as well as intrinsic features. In such cases, meaning may be added to the segmented string through the analogue shape of the whole layout. Such non-linear, unsegmented and analogue features present something of a challenge to the linguistic model. To pursue this issue further it is necessary to make a brief excursion from the typographic context to that of pictorial imagery, a much more severe test of the linguistic model.

Writers on graphic design often talk as if there is a language of visual imagery which mirrors verbal language. Booth-Clibborn and Baroni (1980), for example, claim that they 'have analysed the graphic language over the last few decades and have found that a universal syntax emerges'. Thompson and Davenport (1980) similarly claim that 'graphic design is a language. Like other languages it has a vocabulary, grammar, syntax, rhetoric'.

These are bold claims and, although made in short introductions to illustrated books and backed up by no specific evidence, are probably seriously meant. They are in good company, since others with more serious theoretical intentions have also maintained that apparently unsegmented graphic images can be analysed in a linguistic manner.

Ivins (1953) used the term 'syntax' to describe the conventions used by engravers to make reproducible images before the days of the photographic half-tone. For Ivins, visual syntax referred not to the objects depicted but to the manner in which black and white lines were deployed in order to produce the complete grey scale. For example, wood engravers use closely-spaced cross-hatching to create the illusion of light and shade.⁵⁴ Although it is less obvious from a distance, the same technique of illusion is used when photographs or paintings are 'screened' (broken into dots of various sizes) for printing. According to Ivins, different syntaxes grew from the various print-making technologies and stylistic inventions of particular artists and eras. The typographic equivalent might be the different repertoires of variants offered by different composing systems (for example, the upper case/lower case/underlining/ second colour repertoire of the mechanical typewriter as compared with the greatly extended range of the phototypesetting machine).

Illustrators and engravers are responsible for making every mark contribute to the depiction of a visual scene. In effect, each line, mark or smudge *explains* some aspect of the object depicted or the play of light upon it: hence Ivins' use of the term 'syntax'. He also refers to perspective as a 'logical *grammar* for the representation of space relationships in pictorial

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⁵⁴ Elsewhere (Ivins 1943), Ivins makes explicit reference to psychological experiments into visual illusion, but the full extent to which representational art rests on illusions of all kinds has been discussed at length by Gombrich (1960) and Arnheim (1969).

statements' (p. 23; my emphasis). Twyman (1985), who reviews a number of implications of the language analogy, also uses the word 'grammar', although within quotation marks, in relation to conventions of drawing, such as cut-away, isometric and perspective techniques.

Ivins' use of the term 'syntax' is appropriate only in the limited sense that he is dealing with systems for the combination of separate components.⁵⁵ In verbal language it is syntax that dictates which word-orders are legal and which are illegal. Without separate components, then, syntax is an inappropriate term. Ivins' components, though, are of a very low semantic status – visible marks, such as cross hatchings or dots, rather than signs with an independent meaning comparable to that carried by words in verbal language.

A 'linguistic' approach to iconic displays at a higher semantic level is proposed by Gombrich (1960), who chooses vocabulary rather than syntax as the point of comparison.⁵⁶ Gombrich does not so much look at the exact mark-making system of the artist as the people and things that he or she depicts. With some notable exceptions (such as the impressionists, nineteenth-century wood-engravers working from photographic originals and the recent school of super-realists), most artists have not behaved like digital scanners, transcribing exact retinal images onto the canvas. Instead, Gombrich argues, most artists have seen their task as the depiction of separate (or at least, potentially separate) semantic units, albeit considerably modified and merged into unitary compositions. Twyman (1985) makes a similar distinction between *synoptic images* and *images composed of discrete elements*.

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55 Since they do not consist of separate marks, Ivins regards photographs as 'pictorial statement without syntax'. Ivins' view of photographs as unmediated samples of reality may not have been a fully considered one, since he sees them largely in contrast to engravings where the mediation is extreme. However good the verisimilitude of a picture or photograph, it is still the product of an artist or photographer who must frame the image and select an appropriate technique for projecting it onto the two-dimensional surface of the page. Even the most descriptive pictures are selected for a purpose and so are to some degree explanatory.

56 In an early instance of the linguistic analogy (in *De pictura*, drawn to my attention by Van Sommers 1984), Alberti draws a parallel between the learning of writing and of painting: 'I would have those who begin to learn the art of painting do what I see practised by teachers of writing. They first teach all the signs of the alphabet separately, and then how to put syllables together, and then whole words. Our students should follow this method with painting. First they should learn the outlines of surfaces, then the way in which surfaces are joined together, and after that the forms of all the members individually.' (Alberti 1435/1972: 97). As Twyman (1985) shows, manuals for teaching artists often take a similar approach, in which images are built up from schematized elements.

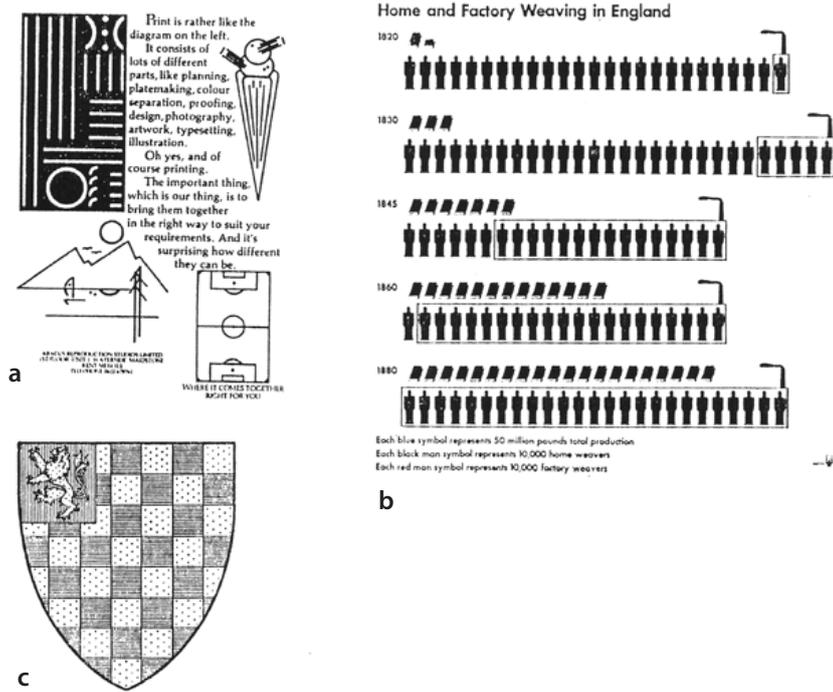


Figure 3.1 Object-oriented computer graphics (a), Isotype diagrams (b), and heraldry (c) are examples of graphic displays formed from discrete semantic units.

This approach is the basis of object-oriented computer graphics programs. As Figure 3.1a demonstrates, these programs can treat parts of images as separate objects which can be copied, rotated, enlarged and so on. It is also the main principle of the Isotype system of pictorial communication which uses a vocabulary of standard symbols (Neurath 1936; see Figure 3.1b). An older example of a visual system with linguistic parallels is heraldry (Figure 3.1c), with its vocabulary of symbols, grammar for their combination and high-priesthood of grammarians (the heralds).

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Gombrich, though, does not confine his schema theory to images composed of discrete elements. He relates a process he calls 'schema and correction' to both the creation and the reading of synoptic images.⁵⁷ According to Gombrich, artists draw on a vocabulary of visual schemata which are then corrected to fit the task in hand. His alternative phrase is 'making and matching': a previously made image is matched to the purpose in hand. This is easy to see in children's drawings where houses, cars and people are typically represented in stereotyped ways, with special details added to identify the particular house or person concerned: a child's drawing of 'Mummy' may be a combination of a woman-schema and an accessory such as a hat or bag to identify which woman. Eco (1976: 206) calls such details 'recognition codes' for pertinent information. Gombrich cites historical

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 57 In contrast to Ivins, who regards syntax as necessary for the making of images but says that 'once they are put together there is no syntax for the reading of their meaning.' (p. 61).

examples as evidence for his claim that the same effect can be seen in adults' pictures as visual schemata develop within a culture over many years. (Figure 3.2 shows an example).



Figure 3.2 Gombrich uses this example to explain his concept of making and matching. A German artist has drawn a flood scene in Rome from verbal reports. The timber castle with the steep roof represents his schema of a (German) castle, but it is modified by a number of features he knows the real castle possesses: round towers, for example.

Although he appears to be using the word 'language' as a loose analogy, Gombrich maintains that:

'Everything points to the conclusion that the phrase "the language of art" is more than a loose metaphor, that even to describe the visible world in images we need a developed system of schemata.' (p. 76)

He goes on to claim that particular cultures have 'vocabularies' of schemata which might cover, say, people, animals, architectural styles, landscapes and so forth.

Not surprisingly, the parallel between graphic images and verbal language has proved controversial. Critics of the 'language of art' viewpoint, such as the philosopher Susanne Langer (1942), point out that there are no pictorial equivalents to the syntagmatic nature of language (its unfolding in time) and or to words with their relatively fixed equivalences that enable the construction of dictionaries. Langer draws on Gestalt psychology to contrast what she terms the *logical* form of holistic art objects with the *discursive* form of verbal language. Verbal language forces us

'to string out our ideas even though their objects rest one within another; as pieces of clothing that are actually worn one over the other have to be strung side by side on the clothesline.' (p. 81)

She acknowledges that pictures can function as symbols but 'a work of art is a single symbol, not a system of significant elements which may be variously compounded'. The symbolic function of iconic displays 'depends

on the fact that they are involved in a simultaneous, integral presentation' (p. 97). Langer's position is rather metaphysical – perceptual forms are for the 'conception, expression and apprehension, of impulsive, instinctive and sentient life' – and not entirely helpful to those seeking an articulated critical method.

Nelson Goodman (1976) has also stressed the unsegmented nature of visual images. According to Goodman, although it is possible to distinguish between *constitutive* and *contingent* properties of a work of literature, this is not true of paintings. Goodman maintains that the concept of a fake copy of an existing novel is a nonsense, so long as the words are correctly ordered and spelled.⁵⁸ The words originally composed by the novelist are what *constitutes* the work: other things, including, presumably, the typographic layout (except those aspects specified by the author), are in Goodman's terms *contingent*:

'In painting, on the contrary, with no such alphabet of characters, none of the pictorial properties – none of the properties the picture has as such – is distinguished as constitutive; no such feature can be dismissed as contingent, and no deviation can be dismissed.' (p. 116)

Goodman compares both verbal and visual forms with an ideal concept of notation which has a number of syntactic and semantic characteristics: in particular, the symbols or characters in a notational system must be unambiguous, disjoint and differentiated. Verbal language fulfils only some of these requirements, paintings none of them. However, verbal language does at least satisfy the requirement to be differentiated and disjoint. This makes it an *articulate* system, in contrast to the *dense* nature of undifferentiated (or, to restore the term we have been using up to now, unsegmented) systems such as paintings.

In effect, Goodman's view supports the notion, introduced earlier in this chapter, that segmentation is more important than arbitrariness in determining whether a linguistic (or some other systematic) approach might be applied to graphic forms. 'Descriptions are distinguished from depictions not through being more arbitrary but through belonging to articulate rather than to dense schemes; and words are more conventional than pictures only if conventionality is construed in terms of differentiation rather than artificiality.' (p. 230)

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58 Unless, presumably, it is claimed to be a copy of the first edition, in which case we are considering it as *qua* printed object or investment, not *qua* novel. More seriously, while we may accept Goodman's analogy at face value in the context of his argument, there are important exceptions. Considerable numbers of writers – mostly poets, but also some novelists – have taken a detailed interest in the typography of their work, or have used it as an integral part of their expressive repertoire. This issue is the subject of debate among bibliographers and some further aspects of it will be discussed in Chapters 4 and 7.

The unique position of typography, and its special interest, is that it fits awkwardly into the picture/words dichotomy. When typographic pages add spatial and graphic qualities to segmented verbal language, they demonstrate the simultaneous use of dense and articulate symbol systems. But Goodman, in common with other philosophers and historians of art, seems reluctant to discuss hybrid forms, and his discussion of diagrams – another hybrid form – is short and somewhat confused.⁵⁹ His main argument on this topic centres around a comparison between an electrocardiogram (a diagram) with a Hokusai drawing of Mount Fujiyama (a depiction). He suggests that 'the black wiggly lines on white backgrounds may be exactly the same in the two cases'. He does not provide a sample of such a drawing (as will become apparent, Hokusai prints do not actually look like diagrams), but Figure 3.3, supplied by Twyman (1985), represents the principle.

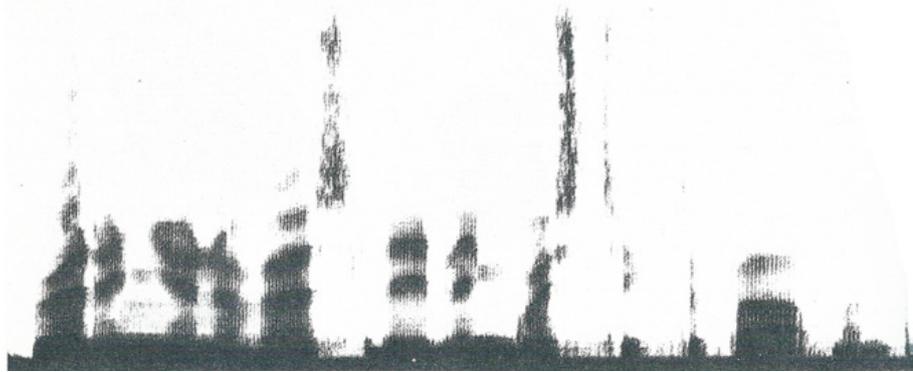


Figure 3.3 A sound spectrogram which was interpreted by one viewer as a petrochemical works

Goodman appears to suggest that, although according to his notational theory a diagram is syntactically dense, yet it is still somehow articulate because it is still possible to distinguish between its contingent and constitutive features:

'The only relevant features of the diagram are the ordinate and abscissa of each of the points the centre of the line passes through. The thickness of the line, its color and intensity...do not matter.' (p. 229)

In effect, Goodman is saying that the essential meaning of the electrocardiogram is preserved even when these contingent factors are altered, whereas each such characteristic of the picture (including even the quality of the paper, conveniently forgotten earlier when the artefacts were said to be exactly the same) contributes to its overall meaning and ambience.⁶⁰

.....

⁵⁹ Or, at least, *confusing* – the layman hesitates to argue with any philosopher, especially one who advises that 'the reader with no background in logic, mathematics, or technical philosophy may well skim or skip [his explanation of the syntactic requirements of notation] and rely on gathering from the applications and illustrations in later chapters the principles expounded here.' (p. 130, footnote)

⁶⁰ In fact, Goodman's examples are not quite as clear cut as he suggests. The apparent spontaneity of Oriental calligraphy and drawing is often rehearsed many times before the production of the final

In practice, of course, we interpret images in the light of what we understand of their context and purpose rather than the philosophical basis of their notationality. Conceptual art apart, electrocardiograms are not framed and put up for auction any more than Hokusai prints are found on clipboards at the feet of hospital beds. Goodman appears to acknowledge the importance of context elsewhere, when he suggests that whether a diagram is analogue or digital is determined by how we are to read it. However, he chooses an example that seems to demonstrate exactly the opposite. A graph produced by a barogram is analogue because, consisting as it does of a continuous trace of a moving pen onto a moving roll of paper, Goodman can claim that it is syntactically dense: every point on the line represents real data. But if the curve merely joins up separate data points, representing, say, annual car production over a decade, it is syntactically disjoint and therefore digital. This seems to ignore the fact that an important purpose of such graphs is to convey analogue information about trends. Although *produced* from a finite number of data points and connectives, in practice we *read* the car production graph as if it were a continuous curve of data. That is the *raison d'être* of this type of graph: to reveal the underlying trends among separate data points. Indeed, we would read the (analogue) trend even if the data points were not joined up, as in a bar chart. In such cases the relationship between components of the image can be considered constitutive. The whole may similarly be greater than the parts in the case of typographic layouts: pages are assembled from separate components but communicate structural information through their overall shape or order. Like graphs, they may be syntactically articulate in their construction but not in interpretation.

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That analogue relationships may be constitutive can be seen by comparing Figures 3.4a, 3.4b and 3.4c which all purport to demonstrate the same principle (of selective perception). One is supposed to be able to see each as either a rabbit or a duck but not both at the same time. First demonstrated in a German magazine in a realist style, the duck-rabbit illusion has become a standard demonstration among, as can be seen from the sources of these examples, art critics, psychologists and philosophers. Two of them palpably fail.

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 version; in other words, it is highly schematized. Moreover, as Schapiro (1969) points out (albeit in relation to Chinese art) the blank space, or ground, against which the image appears, is not considered constitutive of the image in the same way as it might be to Europeans: 'In China where painting was a noble art the owner did not hesitate to write a comment in verse or prose on the unpainted background of a sublime landscape and to stamp his seal prominently on the picture surface.' Conversely, apparently contingent aspects of graphs, such as thickness of line and colour, are the subject of substantial research and debate (for example, Tufte 1984). Furthermore, if an electrocardiogram exhibited variations in the thickness of the line (said to be constitutive in the case of the Hokusai), the machine might well be sent for repair and its output regarded with suspicion.

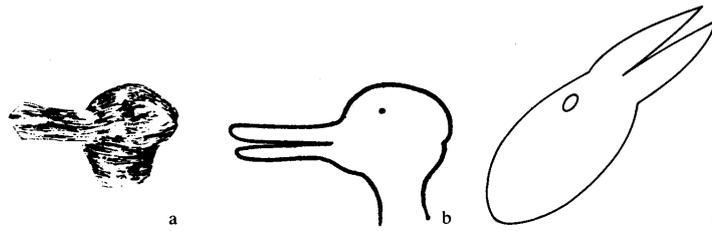


Figure 3.4 This illustration is frequently used to demonstrate the principle of selective perception: you can read it as a duck or a rabbit but not both at once. The illusion works quite well in 3.4a (from Gombrich 1960). In 3.4b (Wittgenstein 1958) I can see the duck, but the rabbit is rather strange. In 3.4c (Bruce & Green 1985) I am quite unable to see anything except a stylized squid.

They fail because, although to their authors they have become tokens of a familiar argument, they don't include enough essential or constitutive information to the new reader. To those familiar with it, it seems, there are just three ingredients to the picture: a head, an eye and a bill/ears feature. Any sketch containing these three features presumably signals the duck-rabbit illusion schema adequately to those for whom it has long ceased to be effective as an illusion anyway.

To the unfamiliar, though, the *exact spatial relationship* between the ingredients is itself a constitutive feature without which, as the second and especially the third versions show, the illusion is ineffective. Again, if the purpose of the picture was to signpost the rabbit cage in a zoo, or to depict a particular rabbit, our criteria would change further.

Ivins includes a similar example from the sixteenth century (Figure 3.5). When illustrations had to be copied from book to book, copyists transferred only what they saw as the major constitutive components (leaves, stalks, flowers), treating the relationship between the components and their exact shapes as contingent. Although the picture still symbolized 'plant', and no doubt helped to sell the book, the illusion (of verisimilitude, in this case) was lost. Again, although the constitutive/contingent distinction is a useful one, it is clearly relative to particular purposes.

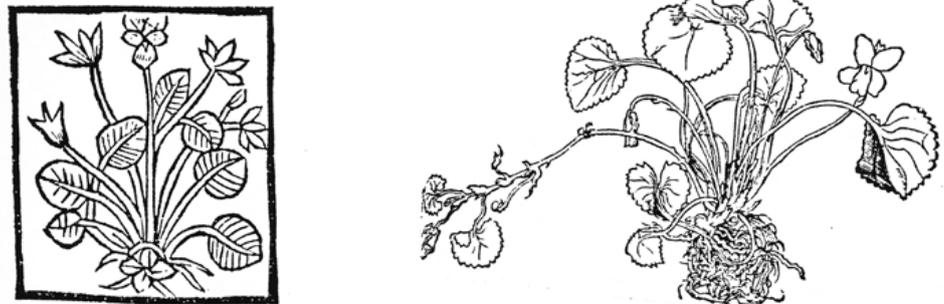


Figure 3.5 Both of these sixteenth-century woodcuts depict violets. Ivins (1953) compares the over-rationalized example on the left (from the *Grete Herbal*, 1525) with the naturalistic example on the right (from Brunfel's *Herbarum vivae eicones*, 1530). However, while the earlier woodcut is clearly over-schematized, the later one is possibly too realistic: it is debatable whether the wilting leaves are really constitutive of the species represented.

In a well known analysis of an advertisement for packaged food, the literary critic and semiologist Roland Barthes (1977) resolves the question of holistic or analogue qualities by treating them as just another sign:

'Even when the signifier seems to extend over the whole image, it is nonetheless a sign separated from the others: the "composition" carries an aesthetic signified, in much the same way as intonation although suprasegmental is a separate signifier in language. Thus we are here dealing with a normal system whose signs are drawn from a cultural code (even if the linking together of the elements of the sign appears more or less analogical).' (p. 46)

A good analogy might be piano music. Since it is produced by separate key strokes, and conventionally divided into regular bars, it is clearly segmented and can, to a degree, be analysed in terms of the relationship between different notes. But although computers might be able to recognize a melody from such an analysis, most of us can only do so by hearing it played. We recognize the overall 'shape' made by the notes, together with other non-separate (or 'suprasegmental') features, such as crescendos and rhythms. Barthes' suggestion is that such patterns, since they are meaningful to us, are themselves signs, even if they cannot easily be segmented for analysis.

Barthes' use of the term 'cultural code' indicates that, like Gombrich, he does not so much analyse the physical marks (notational or otherwise) that make up a picture as the cultural significance of the objects portrayed and the manner of their portrayal. Whether a picture is rendered photographically or through one of Ivins' syntaxes, whether we are looking at reality or depictions, we can still distinguish between separate objects. As Gombrich remarks elsewhere:

'We could not perceive and recognize our fellow creatures if we could not pick out the essential and separate it from the accidental.' (Gombrich 1982: 106)⁶¹

Whether or not we can apply the linguistic method to all of culture – for no aspect of existence escapes the semiologist's eye – is another matter entirely.⁶² Linguistics can be seen as just a prototype of the broader structuralism that has become a dominant metaphor for twentieth-century thought.⁶³ However, the existence of formal semiotic codes is not the issue here, although it will be considered further in Chapter 5. For the time being it is enough to note that there is consistency and pattern in the world, that

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⁶¹ Gombrich use of these terms reminds us that Goodman's distinction between constitutive and contingent features echoes that between *essential* and *accidental* properties in Aristotelian logic.

⁶² I freely confess my alignment with the intellectual cowards chided thus by Sturrock (1986: 89): 'This dramatic extension of the semiotic field, to include the whole of culture, is looked on by those suspicious of it as a kind of intellectual terrorism, overfilling their lives with meaning.'

⁶³ De Saussure (1916/1974: 68) saw language as the paradigm symbol-system: 'Signs that are wholly arbitrary realize better than the others the ideal of the semiological process; that is why language, the most complex and universal of all systems of expression, is also the most characteristic; in this sense linguistics can become the master-pattern for all branches of semiology although language is only one particular semiological system.' (my emphasis)

many human activities are highly conventionalized and that we have a remarkable capacity for inferring meaning from all sorts of circumstances.

The problem of linearity

According to de Saussure:

‘While [the linear nature of the signifier] is obvious, apparently linguists have always neglected to state it, doubtless because they found it too simple; nevertheless, it is fundamental, and its consequences are incalculable.’ (p. 70)

Linearity is fundamental for de Saussure because it is the basis for one of his two fundamental categories of linguistic relations: *syntagmatic* (as distinct from *associative*, often referred to as *paradigmatic*). Syntagmatic relations are the relations that a word has with others in the linear string, or syntagm; associative relations are those that a word has with others that might take its place in the string.⁶⁴

Barthes (1964/1967) applies de Saussure’s associative/syntagmatic dichotomy to a challenging range of semiotic systems, including clothing, meals and furniture. He is able to do so with little difficulty because all of these systems consist of discrete elements (ie, garments, dishes and chairs etc). Later, though, (Barthes 1981) he talks of *iconic syntagms*, by which he means an analogical representation that cannot be subdivided, but which can be treated as if it were a verbal syntagm (that is, a sentence or paragraph). A verbal syntagm is indeed a cluster of signs, but it is essentially a *linearly organized* cluster, and there seems to be little point in transferring the term ‘syntagm’ to other contexts if its associations with linearity are lost. Van Sommers (1984: 1) suggests that the sequence of production can be considered as a graphic parallel to the syntagmatic dimension of verbal language: the artist can only do one thing at a time. However, this may only work in the context of his own fascinating experiments on the way people draw simple line images. The problem with this definition is that, since the sequence of production is rarely apparent to the viewer, the syntagmatic dimension can carry no semantic load. It will be suggested later in the chapter that the graphic equivalent of the syntagm is rather the sequence of inspection or reading.

Linearity may be an obvious feature of language, but that is not to say that cognitively it is ideal. On the whole, it is not a great problem at the sentence level, where comprehension can be handled within working

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Eagleton describes structuralism as ‘a symptom of the fact that language, with its problems, mysteries, and implications, has become both paradigm and obsession for twentieth-century intellectual life.’ (Eagleton 1983:97)

⁶⁴ For example, in the sentence ‘This is a cat’, the word ‘cat’ stands in syntagmatic relationship to ‘This is a...’ and in associative relationship to ‘pet’ or ‘animal’. A helpful ordinary-language version is sometimes used: *choice* and *chain*.

memory – the beginning of the sentence is still available for processing when the end is reached. In a lengthy text, though, readers may need to be explicitly reminded of earlier stages in the argument which must be retrieved from deeper levels of memory. Much of the work of text linguists is directed towards an account of the ways in which language users compensate for this constraint.

The ideal of a one-to-one relationship between language and ideas is part of what has been termed 'the language myth' by Harris (1981). At its heart is the 'surrogationalist' view – the idea that words are substitutes for things or ideas – which elsewhere (Harris 1980) he traces from Aristotle to present day linguistics. This is contrasted with 'instrumentalism' – exemplified by speech act theory (Austin 1962) – in which language is viewed as a multi-purpose tool, only one of whose uses is describing things or making assertions.⁶⁵ We might illustrate the distinction by contrasting the Wittgenstein of the *Tractatus* and the Wittgenstein of *Philosophical investigations*. At one point in the *Tractatus*, he posits an ideal language form in which

'the configuration of objects in a situation corresponds to the configuration of simple signs in the propositional sign.' (1971: §3.21)⁶⁶

Wittgenstein's suggestion was disputed by Ryle (1951: 34), however, who cited numerous examples to show how difficult it is to see

'how, save in a small class of specially-chosen cases, a fact or state of affairs can be deemed like or even unlike in structure a sentence, gesture or diagram.'⁶⁷

In *Philosophical investigations*, Wittgenstein (1958: 11) talks of 'language-games', by which term he wishes 'to bring into prominence the fact that the *speaking* of language is part of an activity, or of a form of life'. Language does not just describe states of affairs, but is used to achieve objectives – for many of which the transfer of information is incidental. The examples given indicate that he includes not only speaking in his definition of language but, among other things, writing, diagramming and drawing.⁶⁸

Although Westcott (1971) cites a number of examples of 'iconic' syntax, in which word order reflects the order of the events described, such cases are rare and the 'fact structure' (as van Dijk, 1977, calls it) of the topic

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⁶⁵ Speech act theory, and its relevance to the role of typography, is discussed further in Chapter 8.

⁶⁶ The development by logicians of notations and diagrams (Gardner 1958) can be seen as part of a dissatisfaction with the ability of ordinary language to fulfil this objective.

⁶⁷ It is interesting to note here that Ryle appears not to consider the two-dimensional form of diagrams any more suited to the direct representation of fact structures than the one-dimensional form of sentences.

⁶⁸ The contrast with the *Tractatus* is made by Wittgenstein himself: 'It is interesting to compare the multiplicity of tools in language and of the ways they are used, the multiplicity of kinds of word and sentence, with what logicians have said about the structure of language. (Including the author of the *Tractatus Logico-Philosophicus*.)' (Wittgenstein 1958: 12).

of discourse rarely corresponds to its linear sentence structure. With the exception of very simple narratives, with one participant and no overlapping episodes, most descriptive texts have to cope with information which is in some way non-linear. Obvious examples are texts which describe complex structures such as machines, buildings, organizations or political situations. In such cases, an essentially multi-dimensional 'reality' must be sorted into a linear string in such a way that it can be re-assembled by the reader. In any case, even where there is a simple linear fact structure, there may be rhetorical reasons for describing the facts in some other order.

Fact structure – the structure of a process or state (real, analogous or imaginary) as posited by the writer – might be contrasted with *argument* structure, the surface structure of a particular text, written for a particular audience or range of audiences. We can see this distinction realized in Halliday & Hasan's (1976) *internal* and *external* uses of conjunctions, which they illustrate with the following pair of examples:

a: Next, he inserted the key into the lock.

b: Next, he was incapable of inserting the key into the lock.

The same conjunction, 'next' refers in (a) to an event in '“internal” or situation time', and in (b) to an event in '“external” or thesis time' (Halliday & Hasan 1976: 240). This use of 'internal' and 'external' is somewhat confusing, though, and it is clearer to talk of (a) as an event in a sequence of *facts*, and (b) as an item in a sequence of *arguments* (always bearing in mind that 'fact' and 'argument' are here used rather loosely).

Ivins (1953), comparing verbal language unfavourably with pictures describes the linearity problem in this way:

'the very linear order in which words have to be used results in a syntactical time order analysis of qualities that actually are simultaneous and so intermingled and interrelated that no quality can be removed from one of the bundles of qualities we call objects without changing both it and all the other qualities. [...] In a funny way words and their necessary linear syntactical order forbid us to describe objects and compel us to use very poor and inadequate lists of theoretical ingredients in the manner exemplified more concretely by the ordinary cook book recipes.' (p. 63)⁶⁹

And Langer (1942), contrasting presentational (pictorial or diagrammatic) and discursive (verbal) forms says of pictures that

'their complexity...is not limited, as the complexity of discourse is limited, by what the mind can retain from the beginning of an apperceptive act to the end of it. Of course such a restriction on discourse sets bounds to the complexity of speakable

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⁶⁹ This advantage of pictures over words leads Ivins to view the development of reproducible pictures as the most significant cultural, scientific and philosophical event since the development of writing, the lack of which was the main 'road block' in the way of classical culture and science. Ivins' preference for objects over theories, the museum curator's perspective, perhaps, might have led him to exaggerate somewhat.

ideas. An idea that contains too many minute yet closely related parts, too many relations within relations, cannot be "projected" into discursive form; it is too subtle for speech.' (p. 93)

Grimes (1975), a linguist whose work on discourse has been particularly influential among cognitive psychologists, shows that even time-based narratives are subject to the constraint of linearity, since they often involve several participants who must be identified, and whose actions may be related by overlapping, co-operation, causality and so on. Besides events and participants, most narratives contain 'non-events', listed by Grimes as settings, background information, evaluations and collateral information. I shall discuss other approaches to the analysis of 'fact structures' in Chapter 6.

While the linearity problem is at the heart of all text or discourse studies, few have directly addressed it as an issue. A recent exception is de Beaugrande (1981) whose theory of linear action is developed further in *Text production: towards a science of composition* (1984), an attempt to build a theoretical understanding of the writing process, and hence the teaching of writing, on a foundation of cognitive and linguistic theory.

<i>Principle</i>	<i>de Beaugrande's explanation</i>	<i>Examples from typography</i>
Core-and-adjunct	Distinguishes between core and peripheral entities	Typographic signalling of notes, glosses, etc
Pause	Allows the on-line sequence to be retarded or suspended	Interpolated boxes, inserts or footnotes
Look-back	Subsumes all consultations of the prior discourse	Regularity of layout pattern, tabular structure
Look-ahead	Subsumes all anticipations of the subsequent discourse	Regularity of layout pattern, tabular structure, headings
Heaviness	Concerns gradations of importance, emphasis, focus, length, salience, or novelty, in the sense that these all draw a 'heavier' load on processing.	Typographic emphasis, spatial isolation
Disambiguation	Deals with excluding alternative patterns, both formal and conceptual	Use of layout to direct reading sequence or to group related items; access structures
Listing	Handles the enumeration of comparable items in a sequence	'Bullets', numbering systems, tabular structure

Table 3.2 Seven linearity principles (adapted to tabular form from de Beaugrande, 1984) with my suggested application to typography.

De Beaugrande identifies the seven 'linearity principles' listed in Table 3.2.⁷⁰ They comprise a framework within which he is able to relate the various phases of cognitive processing involved in reading with the different rhetorical and linguistic forms used by writers (as well as the cognitive processes through which writers select and produce those forms). An examination of de Beaugrande's framework may offer some insight into the linearity of language, how it is overcome, and, perhaps, how typographic techniques might contribute in this respect.

The seven principles, de Beaugrande argues, govern the ways in which writers transcribe multi-dimensional ideas into a linear linguistic form. My 'transcribe' telescopes de Beaugrande's fairly elaborate cognitive model of reading and writing into a single term, but it deserves a brief summary. De Beaugrande criticizes earlier serial models of writing which involve a series of discrete 'black-boxed' stages. Ideas progress through pragmatic, semantic, syntactic, and lexical stages until they achieve surface expression as phonemes or graphemes. These reflect the structure of linguistics and are convenient for psychological experiments, but they do not stand close analysis.⁷¹ More recent models can be described as 'parallel interactive', since they allow for the different levels to be activated simultaneously. In this context,

'linearity reflects the organization of the language modalities of speech and writing, rather than one-by-one mental processes.' (p. 104)

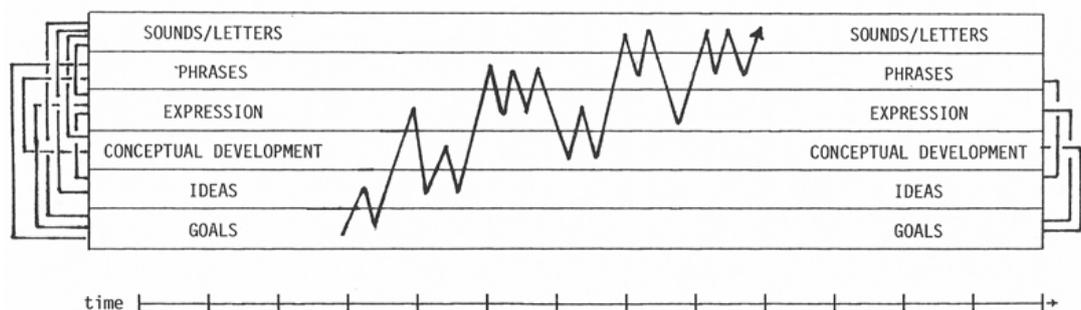


Figure 3.6 De Beaugrande's parallel interactive model of reading (1984)

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70 De Beaugrande's books, although apparently aimed an interdisciplinary audience, are extremely hard going, heavily larded with citations and technical terms. Cynics may find a possible explanation on p. 284 of his *Text, discourse and process* (1980), where he is discussing the use of readability formulae for schoolbooks: 'I consider the principle of "least effort" wholly misconceived as a standard of human activities at large and of the reading of texts in particular. Readers will gladly expend more effort, *provided that the text awakens interest and rewards the effort with informative insights.*' (author's emphasis)

71 Models of reading comprehension are discussed further in Chapter 4.

De Beaugrande's own model (Figure 3.6) suggests six levels of processing. As he puts it,

'the zig-zagged arrow suggests a gradual migration of dominance from deep to shallow during text production, yet with considerable freedom for shifting up or down.' (p. 105)

The psychological problem of how parallel processes are managed is not our concern, but at some stage, although originating as non-linear conceptual networks and processed at the deeper levels in non-linear ways, ideas must eventually be linearized at the surface level. Hence the seven linearity principles.

De Beaugrande does not properly explain the source of the seven categories (why seven? why *these* seven?), and they have a rather arbitrary feel about them. Take, for example, the relationship between surface features of the text and cognitive processes. In the case of the 'look-back' principle there seems to be a direct link: specific backward-looking features of the surface text are deployed in order to control or facilitate cognitive looks-back by the reader. In the case of the pause principle, though, the link is tenuous. Its function in cognitive processes, to cope with processing overloads, does not appear to relate at all to its function on the text surface, where it articulates phrase and sentence boundaries.

The diagrammatic version of the principles (Figure 3.7) indicates that they overlap considerably in practice. The flow-of-control arrows show that, in most circumstances, a number of different principles must operate together. For example, following the arrows in the *core-and-adjunct* diagram leaves one at the end of a line, needing to return to the core in order to follow up the various other adjuncts in turn. In practice, a core-and-adjunct text might be one where the author makes a proposition and then discusses various problems and corollaries of it. First, the author must *look ahead* to the sub-arguments to be presented; they may even be *listed*. At the end of each sub-argument, the *look-back* principle would operate as readers are reminded of the main proposition. Finally the *disambiguation* principle might demand that certain arguments be dismissed and others selected for further attention.

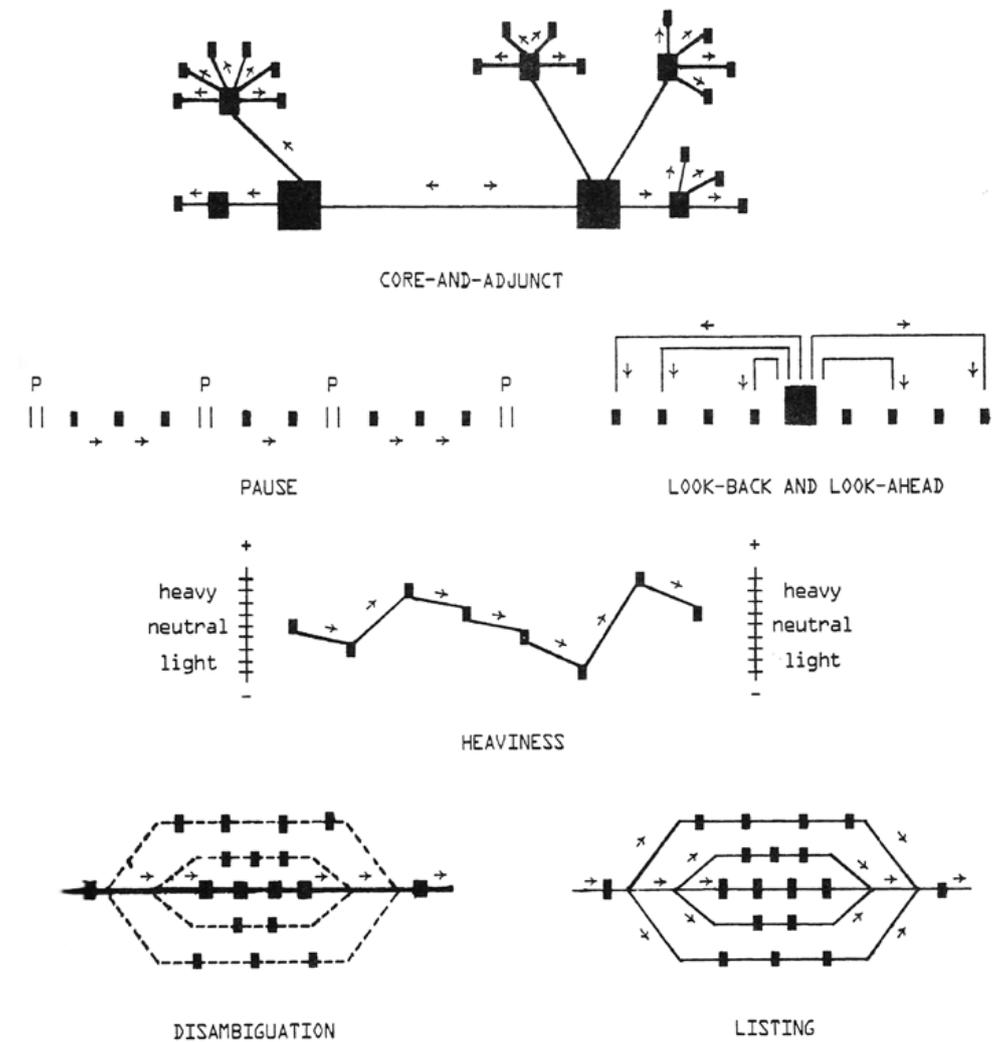


Figure 3.7 De Beaugrande's diagrams illustrating his seven principles of linearity

Linearity is certainly implicit in speech, bounded by time, but writing, with two dimensions available, can present large tracts of discourse instantly accessible to the searching eye. Certain of de Beaugrande's diagrams might even serve as models for typographic layouts which would reveal the structure of the (non-linear) argument or encourage an appropriate reading strategy. Indeed, he does recognize that linearity in writing is spatial not temporal. But since his topic is the composition of continuous prose for fluent reading, it is perhaps not surprising that de Beaugrande restricts his view to the one-dimensional spatiality of the line, rather than the two-dimensional spatiality of the page.

The one-dimensional view of language seems to be remarkably persistent among other scholars also. For example, Vachek (1967) similarly observes the spatial dimension of writing, and similarly fails to develop the implications of that fact. And even in a conference devoted to the re-integration of writing into the linguistic and psycholinguistic domains,

the following statement is reported among the discussion after a debate on ideographic writing systems:

'Gough asked if all writing systems are linear. Apart from early pictographic writing, the group agreed that this was the case.' (Kavanagh & Mattingly, 1972: 128)

De Beaugrande also appears to miss or ignore a further important implication of the spatiality of writing, whether one- or two-dimensional. Because it is presented in space, not time, writing offers the reader the opportunity to *physically* look back, look forward, scan a list structure and so on. Without this opportunity, long and complex arguments could neither be easily written nor critically read. However, de Beaugrande restricts his view to *cognitive* versions of those activities:

'The processor may routinely consult the mental representation of prior text and re-scan the surface text only on strategic occasions, e.g. for revision.' (de Beaugrande 1984: 175)

However parallel the cognitive processes in de Beaugrande's model, then, the input is still assumed to be serial. But since one of the most significant aspects of writing is the release of the reader from the temporal linearity of speech, there seems no reason why the cognitive psychologist's perspective should not be extended. De Beaugrande attributes linearity principles to both writers and readers, so the implication is that 'looks-back' among readers can be literal; that is, they can actually look back to an earlier point in the text rather than just their memory of it.

This suggests a crucial distinction. Still taking looks-back as an example, we might say that text features that are solely verbal 'look back' to an earlier part of the linear text string in a metaphorical sense; the relationship is implicit in the language and must be *cognitively* apprehended by the reader. Text features that are graphic, or at least graphically signalled, transfer the responsibility for the look-back to the reader; the relationship is explicit in the graphic form of the text and can be *perceptually* apprehended by the reader – the look-back is real not metaphorical.

Another way to express this is to say that the responsibility for the syntagm has shifted from the writer to the reader. Given that readers of written text can move around it at will, it seems reasonable to propose a concept of reader-syntagm in contradistinction to the traditional syntagm which is entirely controlled by the writer. There is a time dimension to reading, just as there is to speaking, so however non-linear the text, the reader-syntagm still represents a linear input to the process of cognition. The order of that input, though, can be controlled by the reader, on the basis, perhaps, of the visual syntax, schemata or analogical codes, discussed earlier in the chapter.

A word that appears in a prose sentence is supplied to the reader in a *syntagmatic* relationship to its co-text – the other words in the sentence. Its

associative relationships – with words the writer might have chosen but did not – are supplied by the reader's prior knowledge. Conversely, a word in a list, a prototypical graphic configuration, stands in *associative* relationship to its co-text.⁷² That relationship with the other words in the list is defined or reinforced by the list's title or introduction. Its syntagmatic relations are supplied by the reader who can legitimately scan the list in any order. (Readers can, of course, scan a prose sentence in any order too, but cannot be sure of gaining any form of sense predicted by the author).

This chapter has examined de Saussure's two principles of arbitrariness and linearity as a means of identifying some of the main differences between the idealized verbal strings studied by mainstream linguistic science and the partly non-verbal, partly non-linear texts that we call 'typographic'. An important dichotomy has emerged from the discussion, between writer- and reader-syntagm. The next chapter will review evidence of it in a range of debates within the disciplines that comprise discourse studies. Chapter 5 will propose a simple conceptual model based on it.

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⁷² Harweg (1987) has recently pointed out that this characteristic of lists (and other sets of words that are not anaphorically connected) constitutes a counter-example to the normal assumption that associative relations are an aspect of *langue* and syntagmatic relations are a dimension of *parole*.

4

Writer-syntagm and reader-syntagm

I concluded the last chapter by identifying a dichotomy between conventional linear text, in which the order of presentation is largely controlled by the writer, and typographically organized text in which the reader is afforded a greater measure of control. Texts clearly vary in the opportunities they offer for ‘syntagm control’. Continuous prose, especially in the form of novels, offers few visible structural cues to readers wishing to control their own pace. We are normally expected to read a novel from beginning to end; to do otherwise we need specially annotated study editions, or our own marginal notes and underlinings. A table, on the other hand, cannot sensibly be read in a linear order from top left to bottom right. In between these extremes lie dictionaries, reference manuals, textbooks – and the various examples proposed by Bernhardt (1985) in his continuum of visual informativeness.

The distinction between writer-syntagm and reader-syntagm reflects a number of similar dichotomies emerging from other approaches to communication. By examining some of them, we may gain some insight into the nature of the dichotomy and how to resolve it.

Methods of configuration: linear vs non-linear

One of the main axes of Twyman’s (1979) schema for the study of graphic language represents

‘methods of configuration...by which is meant the graphic organization or structure of a message which influences and perhaps determines the “searching,” “reading,” and “looking” strategies adopted by the user.’ (Twyman 1979: 119–121)

Twyman thus proposes a direct relationship between the configuration of a graphic display and the degree of control enjoyed by the reader. Figure 4.1 reproduces Twyman’s schema.

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Method of configuration

	Pure linear	Linear interrupted	List	Linear branching	Matrix	Non-linear directed viewing	Non-linear most options open
Verbal/numerical	1	2	3	4	5	6	7
Pictorial & verbal/numerical	8	9	10	11	12	13	14
Pictorial	15	16	17	18	19	20	21
Schematic	22	23	24	25	26	27	28

Mode of symbolisation

Figure 4.1 Twyman's schema for the study of graphic language (Twyman 1979). In its original context, the schema is used to organize a large number of examples of graphic displays, in order to present a broad perspective of the range of graphic options available.

Purely linear configurations are so rare that for practical purposes they can be ignored. The presence of the linear category is important, though, to emphasize the next category along: it is sometimes forgotten that texts we may think of as purely linear are actually *linear interrupted*. Although most interruptions are arbitrary (discounting, for the moment, the fact that we normally break lines only between words or syllables), there are exceptions to the rule, and I shall return to such arbitrary or artefactual effects later in the chapter, and in Chapter 8.

For now, though, we can see *linear interrupted* text as representing the writer's exercise of strong control over the reader's use of a document. The *non-linear* categories represent much weaker control, and in the case of *non-linear most options open*, virtually no control either in terms of the topic-related focusing that I take to be the basis of *non-linear directed viewing*, or in terms of the reading-rules implicit in *list*, *linear branching* and *matrix*. With the possible exception of numbered lists, in all categories to the right of *linear-interrupted*, the reader exercises most of the control over the order of presentation. Matrices are a particularly clear demonstration of the reader-syntagm. As many 'propositions' can be generated from a matrix as there are cells, quite apart from general observations about patterns among the data.⁷³ Table 4.1 describes some reading strategies that might be implicit in these formats.

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⁷³ Wright (1981) has described some of the sub-skills required by readers of tables.

Configuration	Implied reading rules
Pure linear	Start at the beginning and carry on until the end.
Linear interrupted	Start at the beginning and carry on until the end disregarding interruptions, which are arbitrary; at each interruption, carry on reading on the next line, column or page.
List	If the list is numbered, start at the beginning, taking note of the interruptions, which are meaningful and separate the parts within a whole. If the list is unnumbered, the items can be read in any order.
Linear branching	Start at some other relevant point, and let your response to what you are reading determine which (connected) part you read next.
Matrix	Select one heading from each axis of the matrix and look at the cell formed by their intersection; or vice versa. Or compare all the cells for a particular row or column. Or compare the contents of whole rows or columns.
Non-linear directed viewing	Start at the focal point(s) in the display and carry on as instructed or as seems reasonable.
Non-linear most options open	Do what you like.

Table 4.1 Twyman's methods of configuration (Twyman 1979), with my conjectured reading rules.

It is obviously not realistic to suggest that all actual documents will only employ a single configuration. Applied to the layout in Figure 4.2, for example, we might detect elements of linear interrupted, list, linear branching and non-linear directed viewing.

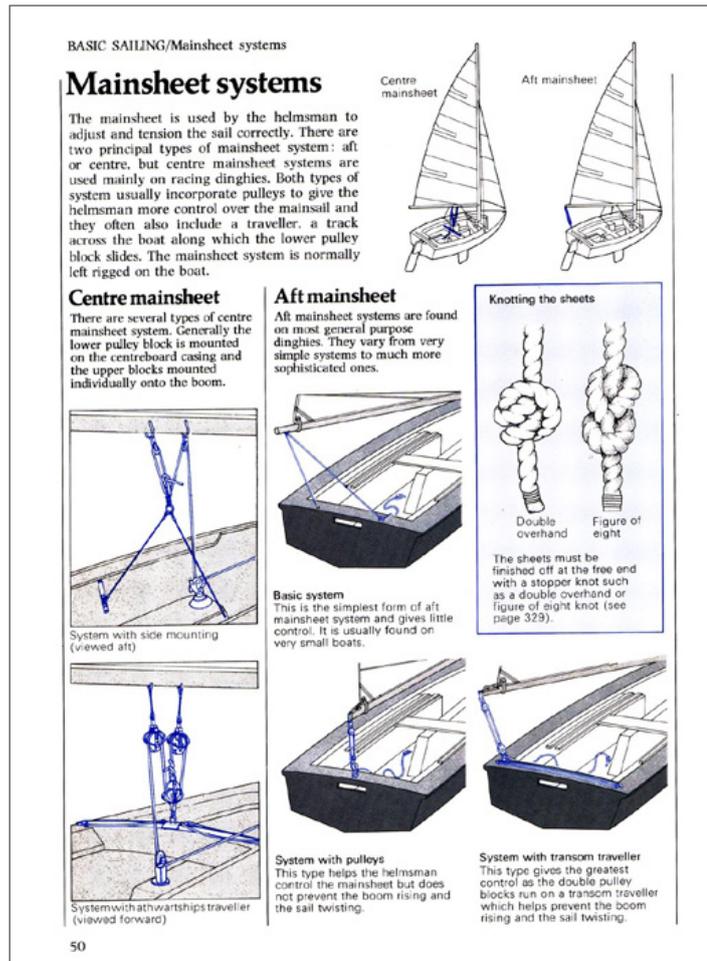


Figure 4.2 In this page (from Bond 1980), the introductory paragraph is *linear interrupted*; the main structure is *linear branching* (centre mainsheet vs aft mainsheet), while the boxed item on knots has no particular place in any linear sequence. It is highlighted in blue, however, and we could regard its placement as an example of *non-linear directed viewing*. The schematic drawings at the top right certainly come under that category, since the relevant parts of the rigging are highlighted in blue.

Reading strategy: receptive vs self-organized

The distinction between writer- and reader-syntagm can also be seen in texts that are a great deal less visually informative than matrices, and even in continuous prose. Thomas & Harri-Augstein (1980) and Pugh (1979), who observed the reading strategies of students (that is, the order and pace of their progress through a text), found that readers who skimmed ahead, re-read, and changed pace frequently were more effective in achieving their goals than those who simply read straight through at an even pace.⁷⁴ The effective readers, we might say, had taken control of the situation.

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⁷⁴ Thomas & Harri-Augstein's Brunel Reading Recorder requires subjects to wind a handle in order to move a roll of text past a window through which they can read. The handle also moves a pen across a sheet of graph paper which travels at a constant rate. Whalley & Fleming (1975) reported a less intrusive device based on a light-pen. A number of other techniques for observing reading behaviour are compared by Schumacher & Waller (1985).

Figure 4.3 shows five reading types described by Thomas & Harri-Augstein from reading protocols obtained with a special apparatus; actual reading records consist of combinations of these five types. This uneven, purposeful style of reading is termed self-organized by Thomas & Harri-Augstein, and self-paced reading by Pugh. Its opposite – reading which follows the author’s sentences and paragraphs in a linear and even manner – is generally described as receptive reading.

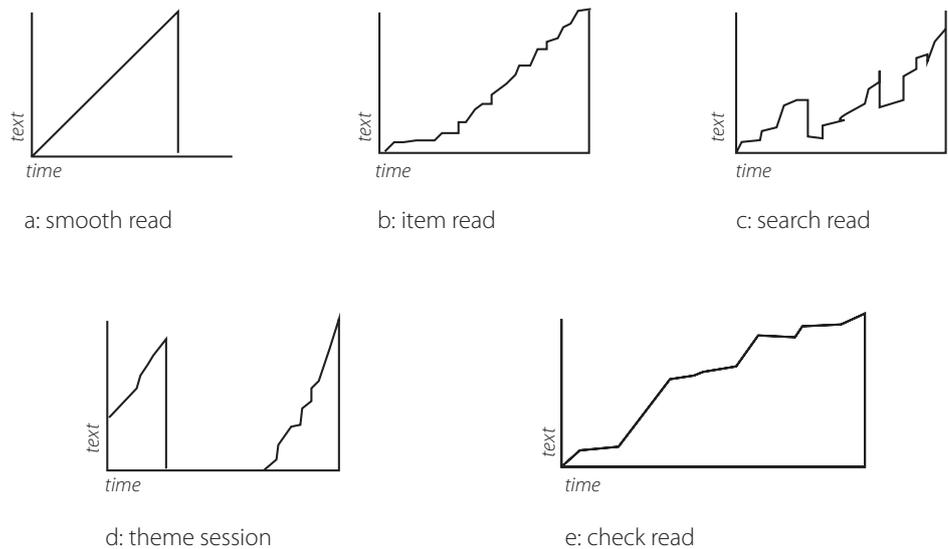


Figure 4.3 Five types of read, identified by Thomas & Harri-Augstein (1980).

Quite apart from such direct evidence, the importance of self-organized reading can be seen by most literate people from an introspection of their own reading habits, and from indirect evidence of other kinds. An unpublished study at the Open University in 1975⁷⁵ showed that no matter how much the reading load varied from week to week on the Arts foundation course, the study times reported by students did not vary by more than about 10–20%. Average study times were between 10 and 12 hours, although the workload varied between 12,000 and over 40,000 words. Although there are other relevant factors (such as the time taken for exercises and assignments), it was clear that students faced with impossibly long reading lists were adopting highly selective strategies – indeed this is a frequently-stated teaching goal of university teachers accused of overloading their students.

Hatt (1976) reviewed research on the reading process from the viewpoint of a librarian, criticizing the usual transmitter-message-receiver model of communication (discussed in more detail in the next chapter). Librarians,

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⁷⁵ The study was carried out by Michael Macdonald-Ross and Alice Crampin of the Open University Institute of Educational Technology.

of course, deal with precisely the opposite direction of flow – ‘receivers’ in search of information, for many of whom, Hatt suggests, it may be irrelevant that messages have ‘transmitters’ or authors at all. As an alternative he suggests a model of the reading process that ‘makes the reader the subject’. Like the one it replaces, Hatt’s model boils down to a beginning, middle and end:

- 1 A reader finds a text
- 2 He reads the text
- 3 He uses the message (or not, as the case may be).’ (Hatt 1976: 20)

Hatt points out that virtually all studies of the reading process focus on stage 2 to the virtual exclusion of stages 1 and 3. His own review, which is well-written and perceptive but appears to be little noticed, therefore concentrates on identifying various routes by which readers reach texts and exit them. His taxonomy of exit patterns is reproduced, without most of his examples and comments, in Table 4.2.

<p>Pattern 1</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader duplicates the text
<p>Pattern 2</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader discards the message
<p>Pattern 3</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader uses the message to confirm an attitude or opinion 5 The reader discards the message
<p>Pattern 4</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader retains, in his store, knowledge taken from the message
<p>Pattern 5</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader modifies his cognitive structure to accommodate new knowledge in the message 5 The reader retains the new knowledge in his modified cognitive structure

<p>Pattern 6</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader uses the message to change an attitude or opinion 5 The reader discards the message <p><i>NB Hatt lists two variations of Pattern 6 in which he replaces step 5 with the outcomes of Patterns 4 and 5.</i></p>
<p>Pattern 7</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader makes a decision, on the basis of the message
<p>Pattern 8</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader makes a decision, on the basis of the message 5 The reader performs an action
<p>Pattern 9</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader accepts the message 4 The reader originates a new message <p><i>NB Hatt notes that Patterns 7, 8 and 9 will only occur in combination with one of the earlier patterns</i></p>
<p>Pattern 10</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader rejects the message
<p>Pattern 11</p> <ol style="list-style-type: none"> 1 The reader perceives the text 2 The reader decodes the text 3 The reader distorts the message 4 The reader accepts the distorted message

Table 4.2 Hatt's (1976) list of eleven patterns of exit from the reading act

It is possible that the ability to organize one's own reading effectively may be related to a further set of dichotomies identified by educational psychologists. Cognitive style describes personality differences between individuals that affect their approach to learning tasks (a recent review is by Shipman & Shipman 1985).

Educational technologists have traditionally seen curricula in terms of learning objectives: testable skills or knowledge that students are expected to attain. In a seminal book, *The conditions of learning*, Gagné (1965) proposed that objectives are best thought of in terms of hierarchies, in which each objective is broken down into sub-objectives that must necessarily or logically be attained before the higher-level objective can be

reached. An important contemporary, Ausubel (1963), proposed a similarly hierarchical ‘theory of meaningful verbal learning’ in which he suggested the use of ‘advance organizers’ which outline the ‘ideational scaffolding’ of superordinate concepts on to which lower-level concepts can be fitted.⁷⁶ However, a widely-cited study by Mager (1961) reported that instructional sequences planned by instructors (of electrical engineering) were often different from those elicited from learners. While instructors built up an explanation of, say, radio engineering from a sequence of basic scientific facts and theories, students were actually motivated by their practical curiosity about familiar objects (radio valves, for example).

To some degree the provision of objectives or advance organizers is intended to impose uniform goals on students. But it is clear from Mager’s study that, even if students are thus provided with the same starting point, given a choice they also differ in the order in which they study concepts within a hierarchy – thus no single order prescribed by the instructor, or writer, is likely to suit all students, no matter how homogeneous their prior knowledge. Like Pugh and Thomas & Harri-Augstein, Pask & Scott (1972) used study protocols to replicate Mager’s findings. They relate their observations to one of a number of different dichotomies identified by researchers into cognitive style, that between holists and serialists. According to Pask & Scott, holists prefer to gain an overview of the total subject, and only to learn the details once their context is established; serialists prefer to build up their knowledge from the bottom of the hierarchy of objectives. Holists, we could say, prefer to take control over their study sequence, while serialists may be content to accept concepts in whatever order they are given, and if necessary delay their full comprehension and integration.

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Eye movements: foveal vs peripheral

Thomas & Harri-Augstein obtained reading records (or ‘protocols’ as they are sometimes known) at a very broad level of analysis, but reading protocols at a much more detailed level, obtained with eye-movement cameras (reviewed by Morrison & Inhoff 1981), also show uneven patterns of reading. Records of saccades⁷⁷ typically reveal an uneven pace with occasional regressions. In fact, Rayner (1978) reported that 10–20% of saccades are regressions.

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⁷⁶ Ausubel’s theory has inspired a considerable number of experimental studies, but the results are inconclusive (Barnes & Clawson 1975). They are of some relevance to typographers, firstly, because they study the effects of a text component (the advance organizer) that is typographically distinguished from its accompanying text; and, secondly, because Ausubel’s theory is based on an essentially diagrammatic metaphor – hierarchies of concepts. Literally diagrammatic versions have also been tried (Jonassen & Hawk 1984).

⁷⁷ *Saccades* are quick jumps by which the eye moves across a line of type between *fixations*; it is during the fixation that readers get information from the written characters.

It is notable that if one were to write out the linguistic inputs encountered by these readers' cognitive processes, they would look remarkably similar to transcripts of speech – just as broken and seemingly incoherent. The false starts, repetitions and incomplete sentences that represent the speaker's (and writer's) fumbling attempts to unravel complex ideas into linear form seem to have a counterpart in readers' attempts to reassemble the meaning. And if this is a valid comparison, it could indicate a functional basis for language behaviour that is sometimes considered inarticulate and confused: both speakers and readers are attempting to sort relevant from irrelevant information, to try different routes before choosing the right one, and to monitor their own or their hearer's comprehension.

Eye movement research also suggests a literal application of Polanyi's (1969) metaphorical distinction between focal and subsidiary awareness in the context of scientific problem-solving (see Chapter 2). Although much of the earlier eye movement research concentrated on foveal vision (the fovea is the part of the retina which has highest acuity) or, in layperson's terms, focused vision, recent studies have emphasized the importance of peripheral and parafoveal vision (the intermediate zone between focused and peripheral vision). For example, McConkie & Rayner (1975) found that the length of saccades can be influenced by information about word length available through parafoveal vision, and Rayner (1975) showed that the presence of boundary letters (at the beginnings and ends of words) affects fixation duration. So, far from being passive recipients of visual information, it seems that we make some strategic choices even at the relatively automatic eye-movement level of the reading process.

The inter-connectedness of focal and subsidiary (peripheral) awareness is easier to see through introspection at higher levels of reading. When we read one item from a list, for example, our focusing on that item only makes sense within a subsidiary awareness of the whole. In the case of tables – intersecting lists – our subsidiary awareness is more complex still. Since language is a system of contrasts, there is, of course, an obvious relationship between any linguistic unit and its accompanying co-text – between figure and ground, we might say.

Reading comprehension: bottom-up vs top-down

Models of reading comprehension suggest cognitive reasons for these observations of the reading process.⁷⁸ Some models of reading (and perception, and other cognitive activities) are known, usually by their

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⁷⁸ It should be noted at the outset of the brief discussion that follows that research into reading comprehension has produced a vast and extremely complex literature. Gough (1984: 246), in a recent review of research on word recognition, notes the pessimistic view that 'we are learning more and more about less and less'. In addition to other sources cited here, a number of chapters in Barr, Kamil & Mosenthal (1984) provide accessible and thorough reviews of the field.

detractors, as bottom-up models. They see comprehension as essentially data-driven and hierarchical. Gough (1972), for example, maintains that decisions about letters precede decisions about words, and that decisions about words precede decisions about sentences. Although out of context, the following short quotations give something of the flavour of an unabashed bottom-up model of reading (produced, it should be said, in the context of a debate):

- ‘Reading *begins* with an eye fixation’ (p. 331)
- ‘letters are recovered...as letters [and] the evident effects of higher levels of organization (like spelling patterns, pronouncability, and meaningfulness) on word recognition and speed of reading should be assigned to higher, and *later*, levels of processing.’ (p. 334, my emphasis)
- ‘I see no reason, then, to reject the assumption that we do read letter by letter.’ (p. 335)

Gough is able to cite empirical evidence in support of his model, although mostly obtained in rather artificial laboratory experiments – individual letters and words can, after all, be recognized (and thus studied and compared by psychologists) out of context. However, once reading is studied within an ecologically more valid methodology, using meaningful text, it becomes apparent that real reading probably does not progress in the orderly linear way assumed by the bottom-up models.

Gough’s model is contested by Brewer (1972) who cites alternative evidence, much of it from cognitive psychology’s first incarnation in the 1880s (Venezky, 1984, calls it the ‘golden age’ of reading research). Cattell (1885/1947), for example, demonstrated that words in prose can be read almost as fast as lists of letters; from this and other evidence he concluded that letters must be processed in parallel, not serially. Brewer also notes that Gough’s model, which has graphemes mapped directly onto phonemes before word recognition can take place, cannot account for evidence of the direct processing of words without a phonological stage. We have already considered some of the evidence for this in Chapter 3.

The alternative top-down approach is explained quite well by the title of Goodman’s influential paper, ‘Reading: a psycholinguistic guessing game’ (1970). Goodman, who analyzed errors made by beginning readers, found that children faced with unfamiliar words would often guess their meaning from the context; this indicated to him that reading involves the constant generation and testing of hypotheses about forthcoming text. Top-level cognitive activity (the expectation or construction of meaning) therefore precedes the bottom-level activity of word recognition instead of the other way around. A similar view is represented in the same publication by Hochberg & Brooks (1970), who stress the purposeful, sampling nature of ‘reading as an intentional behavior’.

Most reading theorists now regard these approaches as extreme positions, and admit elements of both into their models (Samuels & Kamil, 1984, review recent developments in modelling the reading process). Such models (an example is that of de Beaugrande, 1984, discussed in Chapter 3) are known as ‘interactive’. The most influential of the interactive models was proposed by Rumelhart (1977) who posits a constantly shifting relationship between bottom-up, or data-driven, processes and top-down conceptually-driven processes. The domination of one over the other depends on readers’ familiarity with the topic, their reading purpose and the extent to which the text matches their level of reading skill and lexical knowledge. Interactive models, then, suggest a purposeful, top-down process at the strategic level with bottom-up processes only emerging from the automatic or subconscious levels when unfamiliar or difficult text is encountered. An example of this is the ‘articulatory loop’ described in Chapter 3 – an optional sub-system only used in cases of special difficulty (Baddeley 1984).

Interestingly, Rumelhart blames the unrealistically serial nature of bottom-up models on the inadequacy of flow-diagrams,⁷⁹ whose linear structure, he claims, is unsuited to the representation of parallel interactive processes. In common with others investigating the cognition of natural language, Rumelhart’s alternative is computer-modelling; research into reading comprehension may be passing into the domain of artificial intelligence.

Oral vs silent reading

Rumelhart’s approach seems intuitively rather more reasonable than the extreme positions, and so it is not surprising to find that it is, to a degree, a restoration of the model that was current before the behaviourist domination of Anglo-American psychology, to which the more extreme of the top-down theories were reacting. Huey’s *Psychology and pedagogy of reading* (1908), which summarized the research of the previous thirty years, was republished in 1968 and still seems remarkably modern. Another early twentieth century psychologist who, like Huey, was reprinted in the early 1970s just as cognitive psychology was regaining the high ground, was Thorndike (1917/1971), the title of whose paper ‘Reading as reasoning’ could also sum up the modern view. Thorndike argues that

‘we should not consider the reading of a text-book or reference as a mechanical, passive, indiscriminating text, on a totally different level from the task of evaluating or using what is read. While the work of judging and applying doubtless demands a more elaborate and inventive organization and control of mental connections, the demands of mere reading are also for the active selection which is typical of thought.’ (1971: 433)

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⁷⁹ Calfee (1981: 8) has also commented on the confused diagramming practices of cognitive theorists. Whalley (1984) discusses problems of knowledge representation in some detail.

Interestingly, Huey's book and Thorndike's paper, among other publications, have been considered largely responsible for the move in the inter-war years away from a view of reading as the simple ability to translate written symbols into speech (the often mindless activity aptly known as 'barking at print') towards the encouragement of silent reading in which comprehension is the main criterion of success.⁸⁰ So at exactly the time that linguists were relegating written language to a secondary status, educational psychologists were promoting it as a source of direct access to meaning.⁸¹

It is sometimes assumed that silent reading is a comparatively recent development: Pugh (1978) even suggests that it is a nineteenth-century development although this seems an exaggeration.⁸² The problem may be that it is assumed that the way people describe or teach the reading process corresponds to the way they actually read. An oral or subvocalized model might have been the best explanation around, rather than an accurate description.

Some have seen technological causes for the shift from oral to silent reading. The idea that the introduction of printing led to a radical change from an oral to a visual culture, from oral reading in groups to silent reading by individuals, has been suggested by Chaytor (1945), popularized by McLuhan (1962), and developed more recently by Ong (1967, 1982). However, recent reviews of medieval book design (Parkes 1976, Evans 1980, Saenger 1982, Camille 1985, Gullick 1986) indicate that the notion of a purely oral medieval society is an over-simplification, since complex non-linear page layouts were common.

In classical times, it is possible that the lack of punctuation and word division (Thompson 1892, 1912) did impose a largely oral process on both reading and writing (by dictation).⁸³ Although Chaytor is confident that 'no one is likely to contest the statement that the invention of printing and the

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⁸⁰ Pugh (1978) and Allington (1984) provide historical background to this debate.

⁸¹ Sounding a cautionary note about the move away from oral reading, Dearborn, Johnston & Carmichael (1949) reported evidence that the presence of oral stress contributes to language comprehension. Readers who are unable to assign stress to the correct words in a sentence (that is, where the author would have stressed those words when reading aloud) comprehended less. They appeal for the use of typographic variation to indicate vocal stress in print – a combination of the 'typographic cuing' and the 'atmosphere value' suggestions reviewed in Chapter 1.

⁸² Pugh does not cite any direct evidence for his assertion that 'silent reading was not a common activity in schools or elsewhere before the middle of the nineteenth century' (p. 12). However he does cite Chaytor (1945) as suggesting a possible reason for the development of silent reading – the fact that the British Museum reading room would be intolerably noisy if everyone read aloud. But this is to misunderstand the context of Chaytor's remark: Chaytor is simply contrasting the open layout of modern libraries with the design of a medieval library which had carrels to protect readers from the noise of other readers.

⁸³ Thompson makes it clear that word spacing was sometimes used 'in the course of documents of ordinary life, written cursorily' (1912: 56). From a modern perspective it is puzzling to find that the advantages were not immediately recognized and adopted universally. Presumably it was seen as a

development of that art mark a turning point in the history of civilization' (p. 1), Saenger (1982) regards the introduction of word separation as at least as significant. Word separation – described by Saenger as 'the singular contribution of the early Middle Ages to the evolution of Western written communication' – allowed silent copying of manuscripts, which in turn led to the growth of silent reading. The real impetus for silent reading, according to Saenger, came not from printing but from the functional requirements of the growth of scholasticism in the twelfth and thirteenth centuries. The intellectual demands on readers of long books which were heavily glossed and sometimes diagrammed could only be handled by the relatively faster technique of silent reading. It seems reasonable to agree with Saenger's view that

'The complex structure of the written page of a fourteenth-century scholastic text presupposed a reader who read only with his eyes, going swiftly from objection to response, from table of contents to the text, from diagram to text, and from the text to the gloss and its corrections' (Saenger 1982: 393).

However, we cannot know just how swiftly readers went from objection to response – according to the much-quoted Rule of St Benedict (Chaytor 1945: 10), monks were allowed one book at a time and a year in which to read it. That may not have been representative of all situations, of course, but however fast medieval readers went, those living in the era of printed books certainly have more ground to cover. Eisenstein (1979: 72) remarks that with the availability of printed books

'successive generations of sedentary scholars were less apt to be engrossed by a single text and expend their energies in elaborating on it. The era of the glossator and commentator came to an end and a new "era of intense cross referencing between one book and another" began.'⁸⁴

Punctuation theory: dramatic vs grammatical

The debate about oral and silent reading is a cousin of the debate surrounding the phonological equivalence of phoneme and grapheme. It recurs in relation to another aspect of the printed word – punctuation. The history of punctuation, it is often suggested (for example, Honan 1960, Partridge 1953), presents us with yet another dichotomy – between the dramatic and the grammatical.

Chauvier (1849) expresses it thus:

'Those who wrote of old...doubtlessly marked the proper divisions of meaning, but they were essentially orators, and their punctuation would be chiefly oratical. Modern authors, on the contrary, write their works for the press, or

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compensation for the relative illegibility of cursive script that would be redundant in professionally produced manuscripts.

⁸⁴ Eisenstein attributes this quotation in a footnote to Denys Hay, 'Literature, the printed book', p. 366, in *The new Cambridge modern history*, edited by GR Elton (Cambridge, 1958).

to be considered in the retired and silent closet...their punctuation therefore is exclusively grammatical.' (p. 4; the last two emphases are mine)

Dramatic punctuation scores the 'performance' of a text for reading aloud. Question and exclamation marks obviously indicate intonation, while commas, semi-colons, colons and full stops indicate different lengths of pause. Dramatic punctuation is therefore intended for language that is to be heard, whether aloud or by subvocalization. It reached its heights in Elizabethan and Jacobean drama (where, after all, dramatic punctuation is entirely appropriate). Simpson (1911) used the dramatic principle to defend Shakespeare's printers against the charge that they could not punctuate – modern editors feel free to adjust the punctuation of the First Folio as much as they do its spelling.⁸⁵ Often, grammatically unnecessary – even disruptive – commas turn out, when interpreted by Simpson, to have an important rhythmic or semantic role. And, conversely, one of his most powerful examples is of apparent under-punctuation. In the edition of Shakespeare on my bookshelf,⁸⁶ Pistoll (who is being forced to eat a leek by Fluellen) says:

'By this leek, I will most horribly revenge: I eat and eat, I swear – ' (Henry V, Act V, scene II, 49-50)

The First Folio, though, prints it thus:

'By this Leeke, I will most horribly revenge I eate and eate I sweare.'⁸⁷

Simpson's comment includes a nicely literal interpretation of 'pointing':

'It is a pity to clog this disordered utterance with the puny restraint of commas. The words come wildly from the victim while he writhes and eats and roars, and Fluellen's cudgel supplies a very satisfactory punctuation for them.' (p. 12)

In contrast to this performance-related punctuation, grammatical punctuation has the aim of clarifying the structure of the sentence. Here, the various stops indicate the status of text boundaries: the words 'comma' and 'colon' actually originated as units of sense.⁸⁸ Through this style of punctuation, then, the reader can see the hierarchical structure of sentences. It is not stretching the argument too far to suggest that the dramatic/grammatical distinction reflects the writer-control/reader-control dichotomy that forms the topic of this chapter. The visible structure of prose, even in the relatively discreet form of punctuation, can be used as a

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⁸⁵ Further aspects of editorial intervention are considered in Chapter 7.

⁸⁶ WG Clark & W Aldis Wright (eds) *The complete works of William Shakespeare*, New York: Nelson Doubleday.

⁸⁷ I have changed the 'u' in 'reuenge' and the long 's's'.

⁸⁸ According to Thompson (1912: 70) 'Suidas explains a *colon* as a *στιχος* [stichos] forming a complete clause; Joannes Siculus lays it down that a clause of less than eight syllables is a comma, and that one of from eight to seventeen syllables is a *colon*.

basis for free, reader-controlled movement around the text⁸⁹ in a way that was not possible before punctuation and word spaces were introduced. Interestingly, dramatic and grammatical styles of punctuation correspond directly with the two kinds of paralanguage defined by Lyons (1977) – *modulation* and *punctuation*. That both are functions of punctuation (used in the sense of ‘pointing’) explains why I substituted the word *segmentation*.

Some manuals of punctuation, like Chauvier’s, suggest that punctuation developed from a mainly oral⁹⁰ to a highly rule-bound and systematic grammatical system, and thence to our modern-day practice which is a blend of the two. But this appears to be something of an oversimplification. For one thing, such commentators tend to refer mainly to the way in which just one punctuation mark, the comma, is described. Most of the other punctuation marks are interpreted in much the same way by all schools of thought. For example, even the most grammar-bound of theorists admits that exclamation marks connote tone of voice. Conversely, dramatic punctuators have always reserved the full stop to indicate the end of sentences, even though there may be a case for an equally long pause in mid-sentence.

Further evidence that the evolution from dramatic to grammatical punctuation may be an oversimplification is suggested by Husband & Husband (1905), who analyse the punctuation of a ninth-century document, Alfred the Great’s preface to a translation commissioned by him of Pope Gregory’s *Cura Pastoralis*. The Husbands argue that Alfred’s punctuation was a systematic attempt to clarify the structure of his thoughts, and the dot, one of the marks used in the document,

‘is most simply explained with the help of grammatical terms: it indicates a pause...[they explain various categories of pause]...*The pause lessens the risk that either confusion or incomplete comprehension will arise out of the complexity of terms.*’ (p. 24, authors’ emphasis)

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89 Kieras (1985) has reported a number of studies in which the position of sentences within paragraphs and texts influences their perceived importance (earlier sentences are seen as more important).

90 Dramatic punctuation theories may be linked to the commonsense model of reading as a subvocalized process, which predisposes some to a role for punctuation which parallels features of spoken language. Even today we can find those who come to the analysis of punctuation already strongly committed to the primacy of speech. Some remarks by Quirk *et al* (1985) are instructive:

‘Although in this book we repeatedly emphasize the primacy of speech over writing, and of prosody over punctuation, we have to recognize that many types of text take shape first on paper and have their normal realization in graphic form. Punctuation thus has a greater interest for the study of texts than for linguistics as a whole, where it can be looked upon as a surrogate and a rather inadequate substitute for the range of phonologically realized prosodic features at our disposal.’ (p. 1445)

In view of the fact that they devote a whole chapter of their authoritative grammar to text linguistics, it seems curious to single out ‘texts’ (which elsewhere they use to mean both written and spoken samples of language in use) as, by implication, unworthy of serious linguistic study.

Confidence in the Husbands' analysis is enhanced by a more recent study of another translation of Alfred's.⁹¹ Cyrus (1971: 106) found that spacing was used not to separate words but syntactic units, remarking on

‘the astonishing degree of correspondence between sequences identified by the spacings and principle constituent boundaries independently inferable from syntactic features.’

The Husbands attribute the relative lack of punctuation in classical manuscripts to the highly inflected nature of Latin and Greek, and suggest that it is when these languages are translated into the vernacular that some means has to be found to preserve the structural clarity of the original. They suggest this as an explanation not only for Alfred the Great's translation, but also for the detailed grammatical punctuation evident in some Elizabethan writings. Although scholars saw the merits of using the vernacular, they were more used to using Latin as the language of scholarly exposition. Consequently they tended to impose Latin syntax on the English language, and, the Husbands argue:

‘this artificiality of construction necessitated the employment of means by which to make the constructions clear to a reader not exercised in the classics.’ (p. 36)

In view of the Husbands' view that contemporary punctuation was grammatical to an extreme, Simpson's dramatic explanation for Shakespeare's punctuation begins to look like an exception to the general rule. His thesis was in fact vigorously disputed by Fries (1925) who regards it as over-simple and supported by inadequate evidence.⁹² Fries produces counter-examples and demonstrates that where Shakespeare himself alludes to punctuation, which occurs as a metaphor in a number of instances, it is to its syntactic role that he points. This, of course, is not proof in itself, since there could have been two systems – one for prose, to which Shakespeare alludes metaphorically, and one for drama, which he employed as an additional system of stage direction to his actors; or Shakespeare, being Shakespeare, might simply have treated punctuation as he treated other aspects of language – as something to explore and extend.

Although Fries claims to have found evidence of grammatical theories in all the manuals he examined (dating from between 1589 to 1900), Ong (1944) cites many examples of the breathing principle during the earlier half of the same period. It may be that you find what you are looking for; Honan (1960) shows that in many eighteenth-century manuals the

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⁹¹ The Tollemache manuscript of Paulus Orosius's *History of the world* (British Museum Additional Manuscript 47967)

⁹² Ong (1944) suggests that they are both wrong, arguing that the Elizabethans inherited from late classical and medieval rhetoricians a system of punctuation based on breathing places for oral reading. He implies that both the dramatic and the grammatical theories are based on a misunderstanding of this fact: the performative aspect of oral reading suggests a dramatic function, while the need for breathing not to disrupt the sense suggests a grammatical theory.

two theories co-exist, sometimes in a manner that obviously confused contemporaries. Their reconciliation need not be confusing, of course, since it is an aim of good oratory to enunciate the structure of the message as clearly as possible. This is implied by Monteith (1704):

‘Pointing is the disposal of *speech* into certain members for more *articulate and distinct reading* and circumstantiating of writs and papers. It rests wholly and solely on concordance, or government of words, and necessitates a *knowledge of grammar*. The wrong placing of points perverts the sense from the true scope of all speech, which is sound reason.’ (quoted by Husband & Husband 1905: 40; my emphasis)

The opposite has also been argued: that to follow natural speech rhythms may be a good guide to sentence construction. Treip (1970), who gives a detailed account of late sixteenth and seventeenth century punctuation practice, describes the use of rhythmic constructions in prose. And Sopher (1977) has argued for a return to dramatic punctuation on exactly these grounds, even to the extent of challenging taboos such as comma splices and commas between subject and verb.⁹³ But although he accuses the Fowlers and Partridge of being grammatical punctuators, a close reading of those authors suggest that they would probably agree with Sopher that ‘it is this need to satisfy both the eye and the ear of the reader that constitutes the problem of punctuation’. Whatever view they start out with, in the end it seems that most punctuation pundits arrive at a Goldilocks theory: not too much, not too little, but just right – the folklore prototype of thesis, antithesis and synthesis.

In practice, then, most punctuation manuals eventually enjoin writers to punctuate to clarify the sense of the sentence. Although it is not always entirely obvious what they mean by this, it implies that decisions should be taken not from global principles, but according to local needs to avoid ambiguities at particular points in the linear sentence.⁹⁴

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93 Support for this view can be found in Quirk *et al* (1985: 1606) who report a strong tendency among users of English to insert a comma between a long noun-phrase subject and the verb, reflecting a prosodic convention in speech.

94 To some degree we can see fashions in punctuation mirrored in typography; in particular the tendency toward minimalism. For example, Partridge (1953) claims that writers at the turn of the century would typically use ‘a less varied, less discriminatory, less subtle punctuation’ than modern writers. He attributes the change in practice since that time to the Fowler brothers (1906) who recommended authors to write clearly enough not to need much punctuation, although other contemporary writings, including Husband & Husband (1905) and De Vinne (1901), indicate that such a view was fairly commonplace at a time when over-formal grammar was falling into disrepute. Possibly through the enormous influence of *The King’s English* (Fowler & Fowler 1906) and *Modern English Usage* (Fowler 1926), a minimalist approach has grown up reminiscent of the typographic minimalism discussed in Chapter 1, as writers will testify who have had their commas and hyphens struck out by pedantic editors. Partridge’s comments could well apply to typographers:

‘The Fowlers have said that everyone should avoid depending on his stops. Well, of course! But it could with still greater validity be said that to eschew the astonishingly ample resources of punctuation, to fail to profit by this storehouse of instruments that clarify and simplify, that variegate and enliven, that refine and subtilize, closely resembles the action of a pig-headed fellow badly needing spectacles – and refusing to wear them.’ (p 183)

This conclusion finds agreement in de Beaugrande's (1984) recent account of punctuation within a psycho-linguistic framework, one of only two psychological studies of punctuation in English, so far as I am aware.⁹⁵ As we might expect, he suggests his seven linearity principles as motives for punctuation, thus bypassing the dramatic-grammatical debate (Table 4.3).

Principle	De Beaugrande's punctuation strategies
Core-and-adjunct	Cores are more likely to be separated from each other by commas; and less likely to have commas inside them. Adjuncts are likely to be set off from cores unless closely integrated with the latter.
Pause	Mark with punctuation the points where, reading aloud, you would pause. Use a dash to make a relevant insertion or addition without affecting the surrounding format.
Look-back	Use punctuation to terminate and characterize the preceding stretch. Use a comma to make a construction (typically an adjunct) look further back than if no commas were inserted.
Look-ahead	Use punctuation to mark and describe the transition to the next stretch of text Use a comma to mark where the look-ahead of a construction (typically an adjunct) ends.
Heaviness	The heavier a segment, the more likely it is to be bounded by punctuation.
Disambiguation	Punctuate so as to reduce or preclude multiple readings
Listing	Use comparable punctuation to set off each element within a list of three or more

Table 4.3 De Beaugrande's application of his linearity principles to punctuation strategies (adapted to tabular form from de Beaugrande, 1984: 192–213). It should be noted that in their original context they are surrounded by numerous examples and comments

De Beaugrande approaches punctuation in a functional way, to avoid the apparently arbitrary rules that are typically taught:

'the illusion of uniformity in punctuation arises mainly from coercion by publishers, not from agreement in manuscripts.' (p. 192)

As an alternative:

'English instructors [...] can uncover and present the punctuating motives observed by skilled writers, and leave the students to decide what options are best. An "error" is then a failure to respect motives, not a departure from unexplained personal biases.' (p. 193)

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95 Baldwin & Coady (1978) have studied the effect of punctuation on the comprehension of syntax, but their study, although resulting in some interesting findings that are described elsewhere in this thesis, does not place punctuation in an overall linguistic framework comparable to that of de Beaugrande (1984). A paper by Thorndike (1948) is entitled 'The psychology of punctuation' and appears in a psychology journal, but it is actually an attempt to associate the style of famous authors with a count of their different punctuation marks.

For de Beaugrande, then, effective punctuation is deployed with regard to what the reader is likely to need at the particular point in the linear text. Again, local needs take precedence over global principle.

Rhetorical structure: scoring vs programming

Nash's (1980) *Designs in prose* is a practical manual of composition, a detailed exposition of the craft of constructing prose. Along with words, phrases, rhetorical devices and argument structures, he deals with some aspects of typographic layout. Although he deals with this rather hastily, he does at least give it a prominent position at the beginning of the book, rather in the way that layout is the first thing encountered by readers when they inspect a document.

Nash uses 'layout' in a restricted sense to refer to graphological features within a column of type, rather than the design of whole pages. He first discusses two extreme forms, 'lines for copy' (that is, advertising copy), and 'sections for documents' en route to his treatment of paragraphing. Copywriting, with its short sentences, often one to a paragraph, its poem-like use of indention and its creative use of punctuation, has a strongly phonetic quality, which Nash describes as *scoring* a potential vocal performance.

Scoring stands in contrast to the *programming* of texts such as regulations, catalogues and others of a technical character. They typically consist of numbered sections or paragraphs, each self-contained with little need for discursive links with preceding or succeeding sections. Whereas scored texts are essentially linear, with any pre-planning heavily disguised under the surface expression, programmed texts bare their structure for readers to see and use. In Twyman's (1982) terms, they are also typified by the use of *extrinsic* (ie, spatial) typographic features in addition to the prosodically more equivalent *intrinsic* features (ie, variations of typestyle). Programmed texts offer writers the opportunity to treat their task as an elaborate listing operation, relieved of the burden of making the argument flow and cohere, and the fact that their structure is declared and labelled offers readers a measure of syntagm-control.

The burden of making an argument flow is a considerable one. Glynn et al (1982) attempted to measure the cognitive demands of conforming to stylistic and grammatical norms. Subjects who were permitted to submit a persuasive document in note form, or without regard to rules of spelling and punctuation, produced more points in support of their arguments than those who had to produce polished prose. The tasks set by Glynn et al can be seen as ranging from programming to scoring. Flower & Hayes (1980: 41) include 'throw a constraint away' among the strategies they find

used by writers faced with an excessively difficult task. According to their observations, writers sometimes handle problems by ‘simply choosing to ignore their audience or the convention that demands coherence between paragraphs’. Programming the text with numbered paragraphs enables them to maintain at least the impression of coherence.

Scoring and programming bear some resemblance to two alternative hypotheses which Wason (1986) detects in the way writers approach (or are advised to approach) their task. According to his *prescriptive* hypothesis, which I suggest corresponds to Nash’s programming, writing is a ‘process of transcribing previously formulated ideas’ (p. 288). Prescriptive writing is audience-centred, and ‘the hypothesis entails that writers adopt a particular register, such as jargon, simply because they believe it is the required mode of discourse. Hence it can be used, or omitted, at will.’

Wason’s *voice* hypothesis, which as the name implies can be likened to Nash’s scoring, is in contrast writer-centred. It ‘implies that many difficulties in writing are associated with the lack of an appropriate attitude (trust) in the writer’. Wason sees the development of trust in one’s own writing, of faith in the power of writing to reveal and extend one’s ideas, as the key to sincere and, therefore, clear writing. He suggests that jargon is not just a style that can be abandoned at will; rather it is a sign that writers ‘are not writing authentically but are alienated from the topic’.⁹⁶

Wason clearly values the voice hypothesis above the prescriptive one, and this presents something of a challenge to those who would see typography as a means of revealing the ‘programme’ of a text in an audience-related manner. He is, though, talking mostly of creative academic writing, and he does not directly address other kinds. Certainly his remarks on the contribution of sincerity, trust and authenticity echo and articulate my own experience, but it is not clear whether he would agree that it is essential to subject one’s writing to a process of review – perhaps of transformation – before anyone else can be expected to read it.

Nash is something of a virtuoso of rhetorical style, writing all his own examples with an impressive mastery of technique, and pastiche. So it is not surprising to find that he has introduced the scoring-programming dichotomy only in order to resolve it when he reaches his real topic: paragraphs for discourse. He suggests a third term, *expounding*, to introduce the complex set of rhetorical techniques described in detail in the rest of

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⁹⁶ The literary critic Northrop Frye (1957: 331) arrives at a similar diagnosis of jargon in a brief discussion of officialese:

‘a naive intensification of Mill’s desire to speak with the voice, not of personality, but of Reason itself ... what it actually utters, of course, is the voice of the lonely crowd, the anxiety of the outward-directed conformist. Such jargon may be called, borrowing a term from medicine, benign jargon: it is unmistakably a disease of language, but not – yet – a cancerous disease like a demagogue’s oratory.’

the book. But by starting with the two extremes, he compels us to recognize that writers have recourse both to occasional ‘vocal echoes’ and the open declaration of their intentions or programme. I shall return to consider some of the patterns identified by Nash, and ways in which they might be realized in graphic form, in Chapter 6.

Resolving the dichotomy

The various dichotomies reviewed in this chapter (and some others discussed elsewhere in this study) can be summarized in a table:

Context	Writer-control	Reader-control
Graphic cohesion (Bernhardt 1985)	non-visually-informative	visually informative
Markedness (Vachek 1973)	unmarked (eg, roman)	marked (eg italic type)
Perceptual awareness (Polanyi, 1969)	focal	subsidiary, aesthetic,
Paralanguage (Lyons 1977)	modulation	punctuation (segmentation)
Presentational form (Langer 1942)	discursive	logical
Notationality (Goodman 1969)	digital	analog
Layout (Goodman 1969)	contingent, accidental,	constitutive, essential
Configuration (Twyman 1979)	linear/linear-interrupted	matrix/branching/non-linear
Reading strategy (Thomas & Harri-Augstein 1980)	responsive	self-organized
Cognitive style (Pask & Scott 1972)	serialist	holist
Eye movements	foveal	parafoveal/peripheral
Reading comprehension	bottom-up	top-down
Reading teaching	oral	silent
Punctuation	dramatic	grammatical
Rhetorical design (Nash 1980)	scored	programmed

Table 4.4 Writer-control and reader-control of the syntagm, reflected in related areas of study. I have only cited sources where ideas are closely associated with particular scholars.

A consistent thread running through many of these dichotomies is that they embody theoretical constructs, which, sometimes overstated by their initial proponents, have provoked equally overstated reactions. They are practical instances of thesis and antithesis: the tendency to pursue theoretical explanations to pure or extreme forms, the inevitable exceptions to which provoke equally extreme reactions. They also reflect more general

philosophies of their time: we can associate bottom-up models of reading with behaviourism, and grammatical punctuation theory with the age of reason. But the exigencies of everyday communication and the good sense of ordinary language users resist the idealist inclinations of scholars, and, in almost every case we looked at, there was evidence of synthesis: the third element of the dialectic triad of thesis-antithesis-synthesis. We might apply these words of Eric Partridge (1953: 7):

‘In punctuation, grammar represents parliament, or whatever the elected body happens to be called: logic represents King or president: but the greatest power of all is vested in the people...’⁹⁷

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The synthesis arrived at in most of these areas is of the order of: most adults read silently and do not need to move their lips or listen to an inner voice. They are therefore not bound to follow the order of the text in the way it is presented to them. Moreover, they have their own ideas, purposes and questions to which they would like answers and their awareness of context plays an important part in comprehension. They therefore wish to see an overview of the structure of the text, in order better to both comprehend it and search within it. However, verbal language is the medium through which we conduct argument, debate and discourse, and in which many of us imagine we do our thinking. So a large degree of compliance with the author’s linearized structure is necessary if we are to make progress. Moreover, even though our expectations may strongly drive our interpretation, all interesting writing combines familiarity with informativity: if our reading consists only of a search for known (or even hypothesized) information, we may miss the new information which may confound our expectations, but, without which, reading would be pointless.

Although in many respects distinct from one another, the items in the middle column of Table 4.4 share some assumptions about text in common. They assume a model of text as a linear stream of words and sentences whose syntagmatic order of presentation is controlled by its writer, and which is apprehended through its phonological equivalence to speech. ‘Content’ or concept relations are thus linearized for later reconstruction by the reader’s cognitive processes. Here typography does little more than ‘score’ the reader’s performance.

The right-hand column represents a greater measure of control by the reader over the order in which components of the text are inspected. In this model, concept relations can be to some degree mapped or diagrammed directly on the page by typographic and spatial features. The debate is thus about the location of control – whether in all circumstances the writer delineates the syntagm by providing a linear path (or a defined choice

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⁹⁷ As if to demonstrate that he is no linguistic leveller, Partridge goes on to say ‘...or, rather, in the more intelligent people – in good sense rather than mere commonsense’.

of paths), or whether the reader is free to choose from a relatively open display of text components.

In the next chapter I shall explore the relationship of writer, text and reader in terms of a communication model.

5

Communication models

From an exploration of the relationship between typography and language, we have reached a wider perspective in which it is seen in terms of the relations between writers and readers. The obvious way to diagram this relationship – so obvious as to make it a truism – is to link *writer* and *reader* by a line passing through *text* (or *medium*). All theories of language or communication at some point have to state their view of the writer-text-reader relationship, even if it is to exclude much of it from their field, and many illustrate their explanations with variations of the same simple diagram. Bloomfield, for example, who excludes contextual or pragmatic matters from the scope of linguistics, includes a simple model at one point (Figure 5.1). (It leaves little room for doubt about where he stands on the primacy of speech.)

speaker's situation → speech → hearer's response

Figure 5.1. From Bloomfield (1935: 139). (Redrawn).

Many more recent versions of this model can be traced to Lasswell's classic formulation, 'Who says what, in what channel, to whom, with what effect?' (Smith, Lasswell & Casey 1946: 121), and Shannon & Weaver's (1949) mathematical model of communication. Their information theory diagram (Figure 5.2) was originally designed to describe the transmission of electronic information (signals) along wires, but was subsequently adopted in many other fields.⁹⁸ Different versions embellish the diagram in order to model in more detail how their authors believe that messages are encoded, transmitted and so on. Johnson & Klare (1961) reviewed a range of general communication models based on information theory.

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⁹⁸ The analogy between electronic and human communication was anticipated by the art historian Roger Fry (1939): 'If we take an analogy from the wireless – the artist is the transmitter, the work of art the medium and the spectator the receiver... for the message to come through, the receiver must be more or less in tune with the transmitter'.

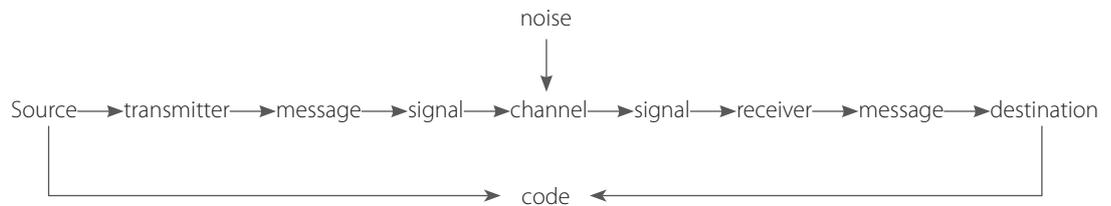


Figure 5.2 A simple Shannon-Weaver type model of communication (this one is from Eco 1976: 33). (Redrawn).

As a model it was attractive because it suggested the application of precise mathematics to the rather intractable problems of human communication. Hindsight, however, shows that graphic communication, in particular, proved rather more resistant to statistical research techniques than was anticipated. Being unsegmented, graphic images present too great a challenge to what was essentially a statistical theory about the probability of ‘bits’ of information surviving transmission without interference (Green & Curtis 1966).

The information theory metaphor undeniably contains the basic ingredients of a communication system (the source of a communication, its vehicle and its user), but it can be easily misunderstood. Although as sensitive a commentator as Gombrich (1963: 60) could remark that ‘what this theory has taught us unmathematical laymen to see with greater clarity is the process of *interpretation* that is bound up with the reception of any signal’ (my emphasis), a cursory look at the famous diagram too often leads to the assumption of what might be termed a ‘transport’ or ‘container’ metaphor for communication: that communication is a unidirectional process, that messages ‘contain’ meaning, and that the outcome of an idealized communication act is the assimilation by a receiver of a meaning identical to that transmitted.⁹⁹ Communication effectiveness so defined (whether explicitly or not) is easy to measure, and the transport metaphor represents an implicit assumption of many experiments in educational psychology,¹⁰⁰ including those on typographic cuing, reviewed in Chapter 1. Meyer (1985: 29), for example, explains that, according to her cognitive model of text comprehension,

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⁹⁹ Ong (1982: 166) refers to a ‘pipeline’ model in which ‘the naive reader presumes the prior presence of an extra-mental referent which the word presumably captures and passes on through a kind of pipeline to the psyche’.

Richards (1926: 175) also comments critically on those ‘who define communication as the actual transference of experiences in the strictest possible sense of transference – the sense in which a penny can be transferred from one pocket to another’.

Lakoff & Johnson (1980b) discuss a number of metaphors for cognition and communication and the need for scholars to be aware of the metaphors that underlie their models and theories.

¹⁰⁰ Brian Lewis talked of a similar ‘medical’ metaphor prevalent among educational theorists. A knowledge deficiency is diagnosed and a course of treatment prescribed until knowledge levels, as measured by the psychologist’s instrumentation, are normal. In the context of mass media research, Tunstall (1970: 4) talks similarly of the ‘hypodermic’ model of communication.

‘readers are assumed to construct memory representations of text propositions which are similar in terms of both hierarchical relationships and content to the content structure of the writer.’

This may be valid for some of the documents that such studies aim to improve (for example, training manuals), but the transport model in its usual form attributes an unrealistic passivity to readers, and fails to give adequate recognition to reader-initiated aspects of reading.

The problem is easy to see in relation to graphic displays such as maps. Although a route map places limits on what may be found out from it, each traveller receives a different message depending on where he or she is starting from and wants to go. There is only a ‘transmitter’ of that message in a very remote sense, and the reader can hardly be described in such passive terms as ‘receiver’, since he or she is supplying the structural and logical framework for the particular message received – in other words, the argument.

There is perhaps no need to overstress this point, since ‘bottom-up’, data-driven models of communication have generally gone out of fashion. Even so, many who research communication processes do not explicitly declare their model of writer-text-reader relations, and the transport metaphor seems to be the ‘default option’. This is partly owing to the words and phrases that spring to mind when we want to talk about communication. Reddy (1979) has identified what he calls the ‘conduit metaphor’ for language. He lists a large number of everyday expressions about language to illustrate his thesis that the metaphor is deeply entrenched in our culture – for example: ‘His words *carry* little meaning’, ‘Try to *pack* more thought *into* fewer words’, ‘It’s hard to *get* that idea *across* to him’.¹⁰¹ Because such expressions are so common, it seems we are predisposed to think of language and media as *containing* meanings.

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Closely related to the conduit or container metaphor is what we might term the ‘reader as data terminal’ model. The assumption that readers are input devices for streams of transmitted data is enshrined in certain editorial practices. For example, the use of ‘op. cit.’ in footnoting assumes that the

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¹⁰¹ Ong (1958) claims that the view of books as containers for knowledge has identifiable roots in the development of humanist thinking in the sixteenth century and can be seen in changes in contemporary publishing practices. He describes the medieval revival of the Greek technique of *topoi* (places) in which knowledge is thought of as stored under easy-to-remember headings. According to Ong, this essentially mnemonic technique was (misguidedly) transformed into a system of ‘place-logic’. As evidence for the new assumption that books are places or containers, Ong cites the development of the title. He detects a progression from the direct dialogue of the manuscript tradition, where ‘books open with a direct address to the reader without the formality of a title at all: “Here, dear reader, you have a book...”’, to descriptive titles (eg, ‘*A book called...*’) and eventually the simple label-like titles we have today – ‘books, and their various parts, were becoming objects which should have simple labels and tags’ (Ong 1958: 313). He does not seem to consider the more prosaic explanation that the proliferation of books following the introduction of printing might have demanded more precise and succinct titles for cataloguing and reference.

reader can remember the work referred to even when it was first mentioned many pages previously.

Coding and decoding

The classic information theory model (Figure 5.2) assumes that the transmitter and receiver share a common set of conventions or codes. The identification of these codes has been the task of the relatively new discipline of semiology.¹⁰² Semiologists find codes in a wide range of phenomena – even those which by their nature seem indivisible and analogue, such as film, architecture, fashion and so on.

In graphic design, perhaps the most thorough exponent of the semiological approach is Bertin (1967/1984), who is unequivocal in the introduction to his *Semiology of graphics* that:

‘in the visual arts, for example, the semiological approach to graphics provides a rigorous analysis of the visual means used by the artist. It defines the basic properties and laws governing the arts and suggests objective criteria for art criticism.’ (p. xi)

Not all media are equally explicit, and Bertin restricts his analysis to rule-bound diagrammatic and cartographic images on the grounds that they are monosemic, as distinct from polysemic or pansemic. Monosemic, polysemic and pansemic images are those which are, respectively, capable of only one interpretation, capable of several interpretations, and capable of an infinite number of interpretations. Pansemic images are comparatively rare (abstract painting might be an example). In practice most but not all pictures are polysemic, although as we have noted they are usually anchored to one interpretation by a caption. Diagrams are (in Bertin’s opinion, at least) said to be monosemic, so long as they make use of explicitly coded graphic conventions.¹⁰³

Bertin is absolutely clear – to the extent of printing it in bold type – about his assumption of a ‘container’ metaphor:

‘Whether we are studying the means, properties and limits of the graphic system, or planning a design, it is first necessary to strictly separate the content (the INFORMATION to be transmitted) from the container (the PROPERTIES of the graphic system).’ (p. 5, Bertin’s emphasis)

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102 Generally speaking, ‘semiology’, the term used by de Saussure to describe his proposed ‘science of signs’, is used by those working in the European tradition. ‘Semiotics’ is used in connection with the American tradition founded independently by CS Peirce (1839–1914), although the word itself has a long history.

103 Against this view, however, we might consider comments made by Anderson (1981: 116) on the rhetoric of diagrams in academic books: ‘one can get away with a little in prose explanation, a lot in a table, and an infinity in a diagram’ – quite a nice definition of monosemy, polysemy and pansemy respectively.

Although welcomed by statisticians, attracted by the certainties offered by ‘a grammar for graphics’,¹⁰⁴ for some other Anglo-Saxon minds Bertin’s work confirms their worst fears about semiology: replete with technical terms and classification schemes,¹⁰⁵ the book ‘contains’ information but fails to communicate it. This is not to say that is not frequently insightful and thought-provoking, but that the needs and questions of the reader seem to be as absent from Bertin the author as from Bertin the theorist.

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Bertin’s consideration of the role of reader is mostly limited to the definition of what he terms ‘retinal variables’ – aspects of the human perceptual system that might be thought analogous to the technical limitations of an electronic receiving device. This seems to reinforce those critics (for example, Sperber & Wilson 1986; Buchanan 1985) who accuse semiologists of an obsession with codes and fixed meanings, to the detriment of inference, rhetoric and other reader-centred factors.

Sperber & Wilson (1986) have recently criticized the coding model that they attribute to many linguists,¹⁰⁶ and to semiologists in particular. They point out that:

‘[although] it is true that a language is a code which pairs phonetic and semantic representations of sentences...there is a gap between the semantic representation of sentences and the thoughts actually communicated by utterances. This gap is filled not by more coding, but by inference.’ (p. 9)¹⁰⁷

Whereas the notion of decoding implies the mechanical recovery of a message put into coded form by a sender, Sperber & Wilson’s alternative, an inference model, appears to assign a more creative role to the audience, who must draw inferences from evidence supplied.

Sperber & Wilson’s characterization of semiology – they are particularly scathing about Barthes – is something of an oversimplification. A number of prominent semiologists have written perceptively about the role of the reader. In *S/Z*, regarded as something of a departure from his earlier, more rigid structuralism (Eagleton 1983), Barthes (1970/1975) distinguishes between *readerly* and *writerly* literature: the former is self-contained, explicit and allows the reader to look through the language to a portrayed world; the latter focuses readers on language itself and gives them a role in creating meaning. Barthes does, however, remain strongly committed

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104 This phrase is from Howard Wainer’s introduction to the 1984 English translation, which he was instrumental in organizing.

105 If grammar is Parliament and logic is King, this style of comprehensive classification of sign systems is the Common Market, obsessed by the harmonization of standards.

106 Their criticism, although independent, is based on many of the same arguments as that of Harris (1981), whose ‘language myth’ was discussed in Chapter 3.

107 Sperber & Wilson’s inference theory builds on the work of the philosopher HP Grice (1975), whose theory of *conversational implicature* has made a considerable impact on the study of pragmatics and discourse processes. It is described in more detail in Chapter 8.

to the concept of codes, although he stretches the ordinary meaning of the term somewhat. For example, although one might think of connotation (as distinct from denotation) as personalized and uncoded, Barthes (1977) explains it by reference to de Saussure's distinction between syntagmatic and associative relationships. For Barthes, words and images connote certain meanings because they are associated along 'semic axes' whose reconstitution 'will clearly only be possible once a massive inventory of the systems of connotation has been carried out' (Barthes 1977: 49). Barthes does not attempt such an inventory, and it is unclear whether it is a serious suggestion, but the very breadth (it would need to encompass images, words, gestures, objects, indeed anything) and depth (the individual's psyche does not escape) of such an agenda is what makes semiology attractive to some, threatening to others, and impracticable to yet others.

Where Barthes is inspired, polemical and somewhat extravagant in his claims, Eco's argument is meticulous, although sometimes complex (Eco 1976, 1981). He is careful to define the code as a 'mere regulative hypothesis' with which to analyse actual instances of signs, and he argues that the code has too many transient aspects to be defined. His reasoning is bound up with the role of the reader, or 'addressee', in his semiotic theory.

Eco, whose notion of *closed* and *open* texts is similar in some respects to Barthes' *readerly* and *writerly*, has made the role of the reader a central part of his semiotic theory. He amends the traditional communication model (Figure 5.2) by separating the sender's code from the addressee's, and introducing 'context' and an 'effort to reconstruct the sender's codes' into the process of interpretation (Figure 5.3). In effect, Eco is giving the reader more work to do, beyond the simple decoding of a signal. Indeed, he talks elsewhere (Eco 1976: 156) of the 'labor of inference'.

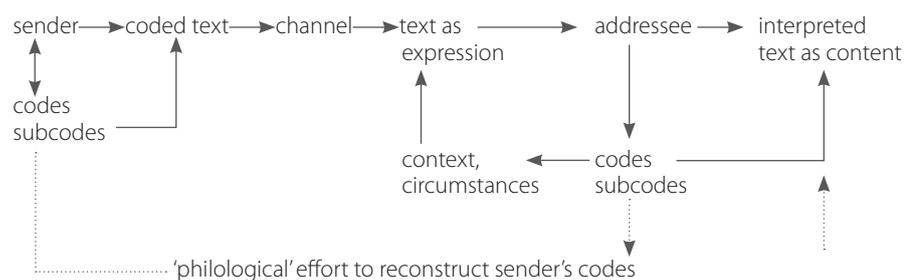


Figure 5.3 Eco's revised communication model, redrawn (Eco 1981: 5)¹⁰⁸

As Figure 5.3 illustrates, for Eco the code is something potentially, but not necessarily, shared by participants in the communication process.

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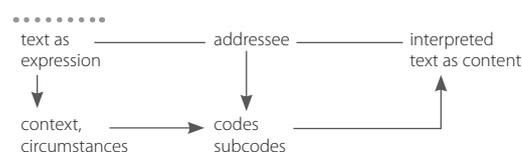
¹⁰⁸ It is worth noting that, although the diagram also appears in his earlier *A theory of semiotics* (Eco 1976), there is a difference between the two versions that could be important. In the earlier version, the arrows between 'text as expression', 'context, circumstances' and 'codes, subcodes' are reversed: they flow from top-left to bottom-right.

Instead of a single code, he considers it more reasonable to speak of a 'complex network of subcodes' that may be strong or weak, and that are subject to constant change as each juxtaposition of elements creates a new, if temporary, connotation. To deal with the problem of shifting and potentially incompatible sender- and addressee-codes, Eco proposes the twin concepts of *undercoding* and *overcoding*, which, although he does not explicitly say so, appear to relate mainly to addressee and sender respectively. Undercoding is mainly a problem for the addressee who must assign provisional meanings to text when faced with uncertainty: sometimes these meanings are confirmed or denied in the light of subsequent text. Overcoding describes the use by the sender of ready-made phrases, intertextual references, clichés and patterns that narrow down the possibility of misinterpretation by the addressee. The significance of these concepts in the context of this study is that Eco regards paralinguistic and other contextual cues (of which typography might be one) as instances of overcoding that enable the addressee to select appropriate subcodes for the interpretation of the message.

Conversational models

An overwhelming impression from the semiology of Barthes, Eco and others is of an assumption that (with the exception of poetic or aesthetic texts) messages are created by one person in order to communicate something to another. However much notice they take of the reader, it appears to be assumed that messages are created, conveyed and attended to as complete entities – whether they be complete myths, complete poems, complete advertisements or complete diagrams. In practice, of course, most spoken conversation is very far from this model. It may be significant that those who, like Sperber & Wilson (1986), have emphasized the role of inference have generally taken conversational discourse as their data.

In the light of the dichotomies discussed in Chapter 4, and their various compromises, typography was seen as a tool for making the content of documents *accessible* to readers with different problems and purposes. I have, in effect, been assuming a model of typographically organized text that provides the basis for a *conversation* between writer and reader in which control switches between the participants.



The accompanying text does not make it clear whether this is intentional or erroneous. Although it is tempting to see the reversal of the arrows as a shift towards an attribution of greater initiative to the reader, a second major difference cancels out that impression. Whereas, in the version shown in Figure 5.3, 'sender' is connected to 'addressee' via the series of left-to-right arrows along the top of the diagram, the original version uses lines only, with no direction of flow indicated.

The idea of textual dialogue is obviously more acceptable when we consider the use of reference books designed for easy access, but it has been argued that even continuous prose is more conversational than it appears. According to this view, writers ‘converse’ with an imagined reader whose questions and objections must be anticipated. Apart from those who study conversation itself (for example, Coulthard & Montgomery 1981, Gumperz 1982, Coulthard 1985), conversational theories of written language have also been suggested in the literature of linguistics (Gray 1977; Winter 1977; Widdowson 1979; Hoey 1983), semiotics (Eco 1981), cognitive psychology (Wright 1978; Nystrand 1986) and among literary critics of the ‘reader-response’ school (Tompkins 1980; Suleiman & Crosman 1980). Crudely summarized, one version of the conversational view is that writers address themselves to an imagined reader (sometimes referred to in the literary critical context as a ‘mock’, ‘model’, ‘virtual’ or ‘implied’ reader) whose characteristics and attitudes the real reader is expected, and – if the writer is skilful enough – able to assume. It is argued that, just like a participant in a conversation, the imagined reader has questions and expectations to be dealt with by the writer. Thus we are asked to empathize with radically different personalities in order to make sense of books by, say, Austen and Hemingway. As real readers, naturally, we will ask different questions, but we must suspend judgement and hope that the imagined reader eventually asks them.

Conversational theories, discussed further in Chapter 8, are the subject of vigorous debate and represent only one of a range of theories of author-text-reader relations.¹⁰⁹ However, there seems no reason why readers should not switch between different reader-roles: between a close identification with the reader anticipated or imagined by the author, a goal-directed strategy of their own, and the distanced view required for critical scrutiny. And this would certainly seem to be easier in non-fiction documents where typographically signalled supports are provided: headings, indexes, lists of contents and other devices that can be grouped under the term *access structures* (Waller 1979a).

If we accept a conversational view of the relationship between readers and texts, then it would seem that our criteria for well-formed texts should go beyond the language surface and relate to the context in which texts are used. Indeed, this is reinforced by the review in Chapter 1 of several linguists who have addressed typographic issues. It was noticeable that all of them had seen the scope of linguistics as reaching beyond the sentence to whole texts or discourses. Another tendency was toward functionalism: typographic features were seen in relation to the use that is made of texts in addition to the meanings that they might embody.

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¹⁰⁹ Further aspects of the debate between conversational (Nystrand 1986) and autonomous models of text (Olson 1977) is discussed further in Chapter 8.

Writer-text and reader-text relations

Those who employ a conversational model of communication are, in effect, suggesting that the arrows in the usual information theory diagram be reversed. A recent example is Nystrand's (1982) model of 'textual space' (Figure 5.4), an application of a more general model of what he calls 'semantic space' – the sphere of meaning shared by participants in a medium of communication.

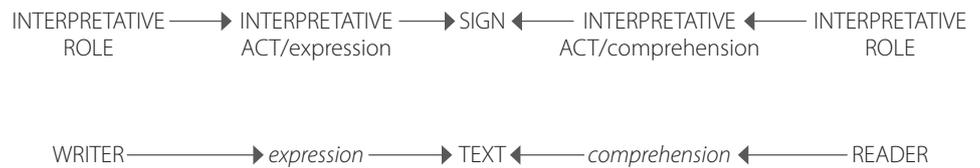


Figure 5.4 *Top*: Nystrand's model of semantic space. *Bottom*: its application to 'textual space'. From Nystrand (1982: 82), redrawn.

The reversing of the arrows between reader and text represents the distinction between bottom-up and top-down models. However, in spite of an explicit recognition that students of the writing process need no longer feel intimidated by the advocates of the primacy of speech, Nystrand insists on applying a general semantic model to all media (including speech, music and painting). This is theoretically neat, and enables Nystrand to draw some interesting conclusions about the problems of learning to read, but it fails to acknowledge a major contextual difference between written and spoken texts, and a further distinction between printed texts and both spoken and hand-written ones.

Nystrand argues that when writers and reader share the same textual space, the material text becomes transparent:

'fluent writers are no more aware of pen and paper than fluent readers are aware of the words they see.' (Nystrand 1982: 83)

This is true and intuitively acceptable up to a point, but sounds remarkably like the primacy-of-speech argument in its neglect of the contribution made by the materiality of the text itself. Stretching the suffix '-graphic' somewhat, we can say that spoken texts and hand-written texts are both autographic. That is, the text heard or read by the 'receiver' is identical in substance (if not always in significance) to that emitted by its author: the sound-waves (or the ink and paper) are the same. Most printed texts, though, are prepared by the writer over a period of time and mediated by complicated bureaucratic and industrial processes of both production and distribution.¹¹⁰ As a result, writers of texts and their readers are separated

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¹¹⁰ Vachek (1967) recognizes the distinction between written and printed language, but takes the view that printed language is neutral and unmarked. This is superficially true if we restrict our view to simple

by a change in time, place *and* material that can be enormous: an Indian student studying *Hamlet* or an English student reading the *Bhagavadgita* are separated by hundreds of both miles and years from their writers; those texts are available in technical forms undreamed of at the time they were written.

The contribution of these intervening processes is highlighted in the model shown in Figure 5.5 (Waller 1979b). The straight-line relationship has been replaced by an indirect ‘dog-leg’ one, reflecting the fact that printed documents *separate* the addresser and addressee to a degree that the telephone, for example, does not. This simple model stresses the necessity of considering the writer-text-reader relationship as *two separate systems*. Sless (1981, 1986) has also emphasized the separate consideration of what he terms author-message relations and audience-message relations.

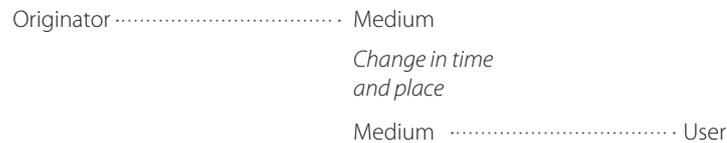


Figure 5.5 The indirect nature of printed communication. From Waller (1979b: 216).

Although still connected by lines, in this version of the model their directionality has been removed. In its original context – an introduction to a special issue of the journal *Instructional Science* on diagrams, the four possible placements for arrows were used to summarize four ways of thinking about their role (Figure 5.6).

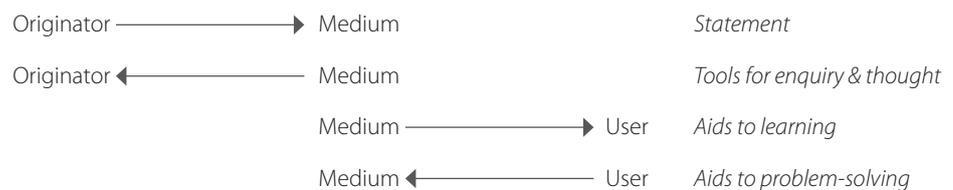


Figure 5.6 Four relationships between writers, readers and texts, suggesting four roles of diagrams. From Waller (1979b: 217).

I have already stressed the active role of the reader, but this diagram suggests that the normal direction of flow between writer and text can also be reversed. Writers do not simply make statements that are comprehended by readers. The very act of self-expression distances the writer from its content and allows objective inspection and evaluation (Macdonald-Ross, 1979, has documented some aspects of the role of graphic notations in

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lines of a common typeface, but if layout, binding and display typography are taken into account, texts originated by different publishers, designers and printing processes can be as distinct from one another as two samples of handwriting.

the generation of scientific ideas). The absence of a physical reader does not mean that the communication is no longer conversational. Just as readers enquire of texts as well as receive information, so the composition process objectifies the writer's thoughts and reflects them back for analysis and amendment. In the light of feedback from listeners' expressions and questions, speakers hesitate, back-track, repeat or retract; writers do the same things but privately, in response to their own reaction to what they have written (Hayes & Flower 1980).

The separate relationships between writer & text and reader & text might be summarized through a pair of metaphors in which writers and readers are represented by traders and their customers; the medium is represented by the counter (or its equivalent) over which the relationship is conducted.

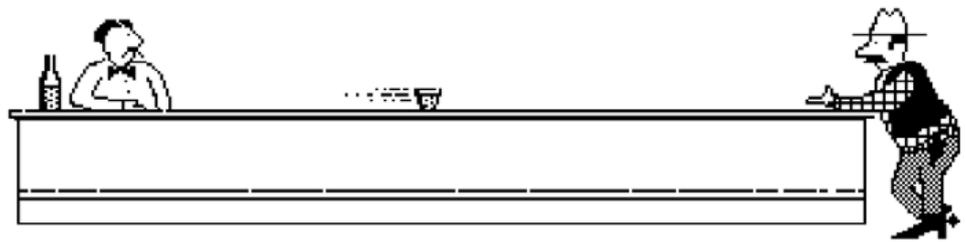


Figure 5.7 The transport model

Figure 5.7 represents the transport model of communication as the bar in a wild west saloon, along which the barman slides the whiskey to the cowboy. There is only one brand on offer which exactly matches the cowboy's need. As long as the bar (the text) is perfectly constructed and the cowboy's drinking (reading) skills are adequate, all the whiskey (knowledge) will reach his stomach (memory). By the use of a stomach pump (or in the educational context, a written examination) it should be possible to monitor the success of the transaction. The metaphor could be elaborated along the lines of information theory to suggest that the barman provide extra (redundant) whiskey in case any imperfections (noise) in the bar surface cause the drink to spill.

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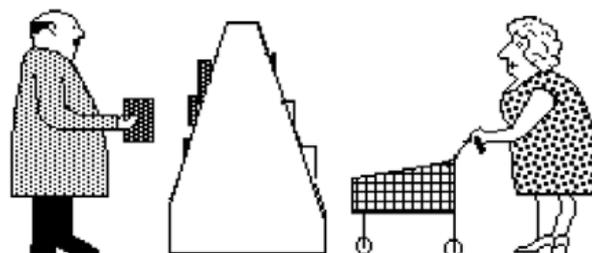


Figure 5.8 The access model

The alternative open-access model is represented in Figure 5.8 as a supermarket display – the focus for choice and self-selection. In this context, as with text, the trader and customer must make a special effort if they want to communicate directly. Instead, their relationship is normally mediated by the display shelves and is separated by the time that elapses between the stocking of shelves and the purchase of goods. The trader must predict the requirements of the customers by ordering the right products, and must present them logically and attractively so that they can easily be found. The customers make their selection according a pre-planned set of goals (a shopping list) or on impulse; they can opt for pre-packaged food or assemble ingredients to process themselves. The trader can of course attempt to influence the customers' choice by careful juxtaposition of items (strawberries next to cream) but must present a coherent overall argument (separate shelves for different classes of goods).

A genre model of typographic communication

The argument so far has been leading up to a simple model that is intended to shed light on the functional constraints that govern the typographer's role in textual communication. Models of communication are typically constructed with a particular context or type of text in mind, whether literary, instructional or technical. Any communication model addressed explicitly to typographers, though, must acknowledge that most of them encounter a wide range of text types from day to day. This model therefore aims to reveal the structures that underlie distinct genres of text. I shall describe the model in three stages.

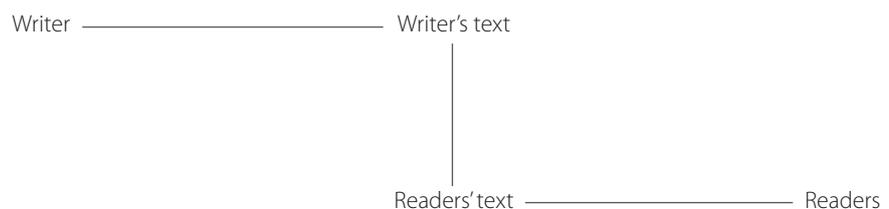


Figure 5.9 Stage 1: the genre model is an adaptation of the 'dog-leg' model in Figure 5.5

As Figure 5.9 shows, the model emphasizes the separate relationships between writer & text and readers & text. The central vertical line represents the publishing process that results in important physical differences (traditionally, at least) between the writer's text and the readers' text. In conventional book-publishing systems the writer deals with a document that becomes progressively more formal as production processes develop: rough notes become typescript, typescript becomes galleys, galleys become pages. Traditional printing methods require the writer to make most significant decisions in relation to a manuscript and a type

specification. The reader, on the other hand, sees a finished product which is expected to betray little of the complexity and difficulties of the writing process.

Figure 5.9 also indicates the conversational nature of the model – writer and readers are seen as ‘conversing’ with surrogates in the form of the text, beyond which they may imagine a writer or readers whose identity is implied by the content, structure and style of the text. The plural form of ‘reader’ is used in the model as a reminder that the writer must frequently provide for the needs of a range of different imagined readers. The singular form of ‘writer’ is used because, even where a number of writers or a team of writers and designers contribute to a publication, readers are normally presented with the semblance of a unified single source – a single imagined writer.¹¹¹

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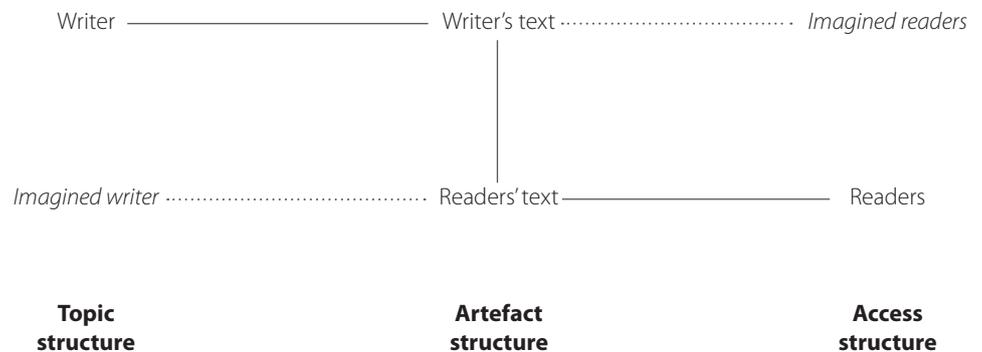


Figure 5.10 Stage 2: each of the three stages in the communication relationship – writing, production and reading – determines an underlying functional constraint on the typographer. In this model, they are termed topic, artefact and access structure.

It is suggested that the three main stages of this model (writing, publishing and reading) account for three kinds of structure which may be, and typically are, overlaid in the same document. I shall call these *topic structure*, *artefact structure*, and *access structure*.

Topic structure includes those typographic effects whose purpose is to display information about the author’s argument – the topic of the discourse. If one purpose of language is to describe the world, then it is easy to see the linearity of language as an imperfection. In its descriptive role, at least, an ‘ideal’ language would directly map ‘reality’ (whatever shape that is). To compensate for its linearity, language is rich in spatial metaphor, and this can sometimes be reflected in a more literal use of space to add diagrammatic qualities to an otherwise verbal argument. It should

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¹¹¹ The roles of the narrator and implied author in fiction have been discussed most notably by the critic Wayne Booth (1961). In the non-fiction context, the nearest thing would be the Open University’s concept of the ‘tutorial in print’ (Rowntree 1982), the full implications of which have never been properly explored in detail.

be stressed that the terms *topic structure* and *topicalization* are used here in a typographic sense; topic structures are also signalled verbally, and it is in that context that they are usually discussed.

Artefact structure represents those features of a typographic display that result from the physical nature of the document or display and its production technology. Page numbers, for example, usually describe units of the artefact (that is, pages) rather than units of the topic. Since everything typographical or spatial uses an aspect of the artefact as a means of signalling (for example, a heading generally begins on a new line), the term must be restricted in some way if it is to be of use. In the context of this argument, it is intended to cover only those features which are motivated by the artefact *alone*, or whose 'ideal' form is constrained by the artefact. An example of this distinction is the signalling of a new chapter in a conventional book. The use of a new page marks the writer's topic boundary and an access point for the reader, but is not constrained by the shape or size of the page. The amount of blank space remaining at the end of the previous chapter, however, is solely a function of the page size, and is therefore artefactual. Any attempt by the reader to interpret it as topically significant is erroneous.

Access structure represents those features that serve to make the document usable by readers and the status of its components clear. These may include aids to interacting with the text as *artefact*: formats convenient for special purposes; navigational aids for the self-organized reader (for example, a list of contents); and isolated signposts that offer guidance at strategic points in the document (for example, 'continued on p. 60'). They also include aids to interacting with the text as *topic*: typography is often used to delineate the status of different 'voices' in the conversation – components such as quotations, glosses, pedagogical devices (statements of objectives, for example).

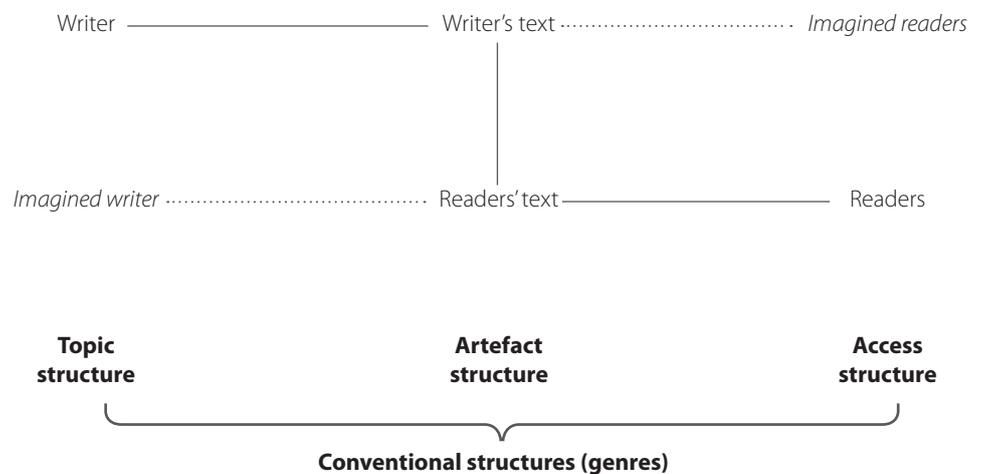


Figure 5.11 Stage 3: the complete model proposes that the three underlying structures (topic, artefact and access) are synthesized in practice by conventional structures that are associated with different genres of text.

The complete model (Figure 5.11) suggests that a typical printed text exhibits a combination of topic, artefact and access structures. The management of their combination, I suggest, may be described through a fourth category, *conventional structure*, which amounts to a definition of typographic genres. The distinction between the three basic structures, it should be stressed, is largely a theoretical one, since in practice they frequently coincide. It has already been noted that new chapters, for example, serve both as access points for the reader's 'conversation' with the book and as topic boundaries. Topic, artefact and access structures are thus heuristic concepts whose main purpose is to form the basis for describing *genres* of typographically-organized documents. They are ideal types which are never or rarely found in isolation, but which are recognizable in combination.

In most genres, all three kinds of structure appear to be inextricably bound together in conventional ways to the extent that it becomes hard to imagine any other way of presenting the same topic, or addressing the same needs. In particular, it will be argued, conventional ways of expressing and accessing topic structures develop within the artefactual constraints of contemporary technologies. When those technologies change, it may be necessary to separate out the three categories of functional imperatives in order to reassemble them to suit the constraints of the new technology.

An example of this is the problem encountered in making tabular information available through computer displays (McLaren, 1983, and Norrish, 1984, describe examples of such a task). The topic structure of a typical railway timetable, for example, includes two main themes: the *network*, usually defined in terms of routes (destinations linked by the network) and *trains* (times, stopping points, facilities). The organization of conventional timetables reflects specific conversational structures, and several parallel versions are sometimes provided.

General purpose timetables for use by people planning journeys are organized by *route*, with places ranged down the y-axis and trains along the x-axis. The times of trains are placed at the stopping points, while facilities are typically indicated by footnotes and symbols. In-station timetables are organized by *time*: the times of trains are listed in bold type, with the stopping points and times listed next to each. These are for people at the station who need to know when the next train is, or where the train just coming in is going: their particular conversational need requires a different way of accessing the information. Other in-station timetables are organized by *place*: travellers look up their destination and find the times of trains from the station they are in.

To display this information on computer terminals requires a different approach. Some new artefactual constraints are introduced: the large

broadsheets used for printed timetables cannot be displayed legibly on a screen. But other constraints are lost because the computer does not restrict us to the permanence of print. In the computer version the distinction between topic structure and access structure is particularly clear – in computer jargon it corresponds to the distinction between the *data structure* and the *interface*. The timetable information exists in virtual form and, given an appropriate access structure can be actualized in numerous different ways, depending on the user's question: how many trains to London on Sundays? how much does it cost to get to Bristol? how far can I go for £10? when is the next train to Glasgow? what is the quickest journey to Brighton? and so on.

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Although it aims to convey the same topic structure as the printed timetable, the different access and artefact structures of computer timetable places it in a different genre: perhaps in the more general genre of *computer database*, which being relatively new, probably contains a number of sub-genres whose identity will emerge as they become more commonplace.

Interaction of the structures

In order to further illustrate the distinction between the three structures I will refer in the next few chapters to a series of pages from an illustrated non-fiction book which makes heavy use of typographic structuring, both through typographic signalling of text components such as headings, and through the layout of pages.¹¹² By attempting to 'parse' these pages in terms of the three structures, it is hoped that some conventions and typical characteristics of the genre to which this book belongs might be revealed.

The first of these pages is illustrated (reduced in scale) in Figure 5.12, which demonstrates some simple aspects of the interaction of the three structures. This page, describing 'Mainsheet systems', contains a fairly clear *topic structure*, as defined by the main headings (indicated in Table 5.1 in bold type according to their hierarchy on the page) and captions to illustrations.

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¹¹² *The handbook of sailing* by Bob Bond, published by Pelham Books, London, in 1980. The book was produced for the publisher by a firm of 'book packagers', Dorling Kindersley. The development of book packaging over the last few decades has been an important factor in the evolution of graphically structured texts. The term refers to specialist firms who develop titles from initial concept through to printed object, but on behalf of other publishers. The concept is usually sold to several publishers, in different countries, before it is actually developed in detail. Consequently, development costs which would be too high for a single publisher can be shared. Printing takes place at a single factory, with all editions sharing the same colour printing. The text is then overprinted in a separate run for each publisher's edition.

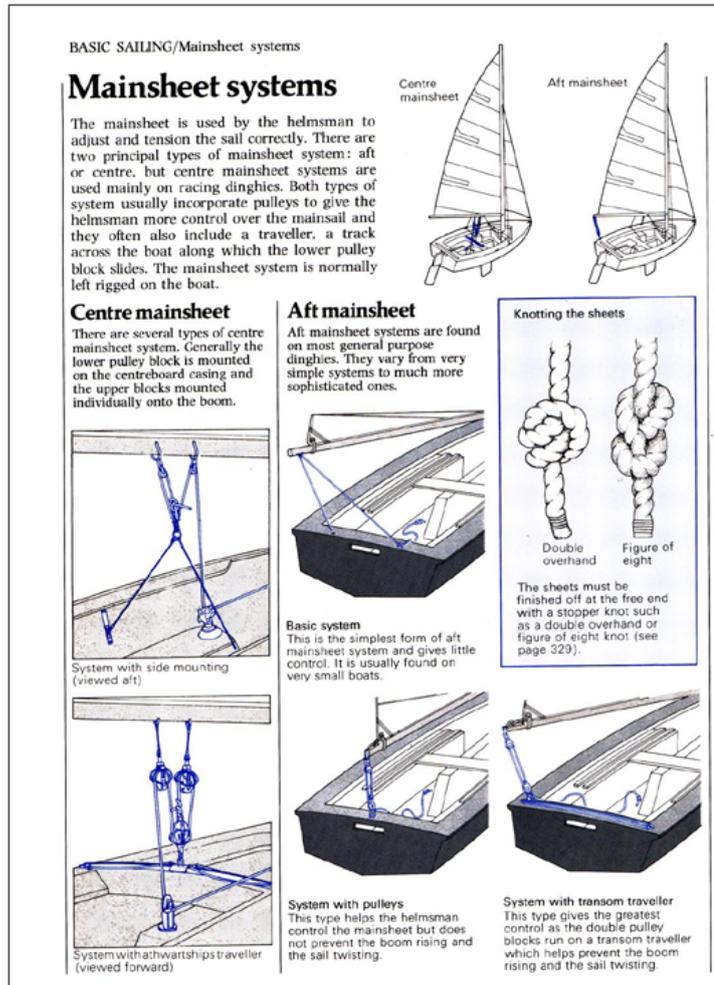


Figure 5.12 A page from *The Handbook of Sailing*, by Bob Bond (Pelham Books 1980)

Mainsheet systems

Centre mainsheet

Centre mainsheet

side mounting
traveller

Aft mainsheet

Aft mainsheet

Basic system
System with pulleys
System with transom traveller

Knotting the sheets

Double overhand

Figure of eight

Table 5.1 The topic hierarchy represented by the layout of Figure 5.12. Topics represented by illustrations are indicated by italics.

The topic structure is reinforced in the introductory paragraph, where we read ‘There are two principal types of mainsheet system: aft or centre...’ The introduction also includes comment on the topic and subtopics – it defines mainsheet, indicates that one type is mainly used

on racing dinghies, and tells us that the mainsheet system is normally left permanently on the boat. The item on knots, although relevant to the main topic of the page, is both graphically and topically independent. It repeats information given in a special section on knots elsewhere in the book, and has probably been used here as a filler.

However, if we expected the typography of the page to follow this simple hierarchical topic structure, we might be puzzled by the apparent failure to align the small contextualizing illustrations (top right) with their matching sub-headings. If there were no considerations other than to display the topic structure on the page as one might a diagram, then the page could have looked much like Figure 5.13.

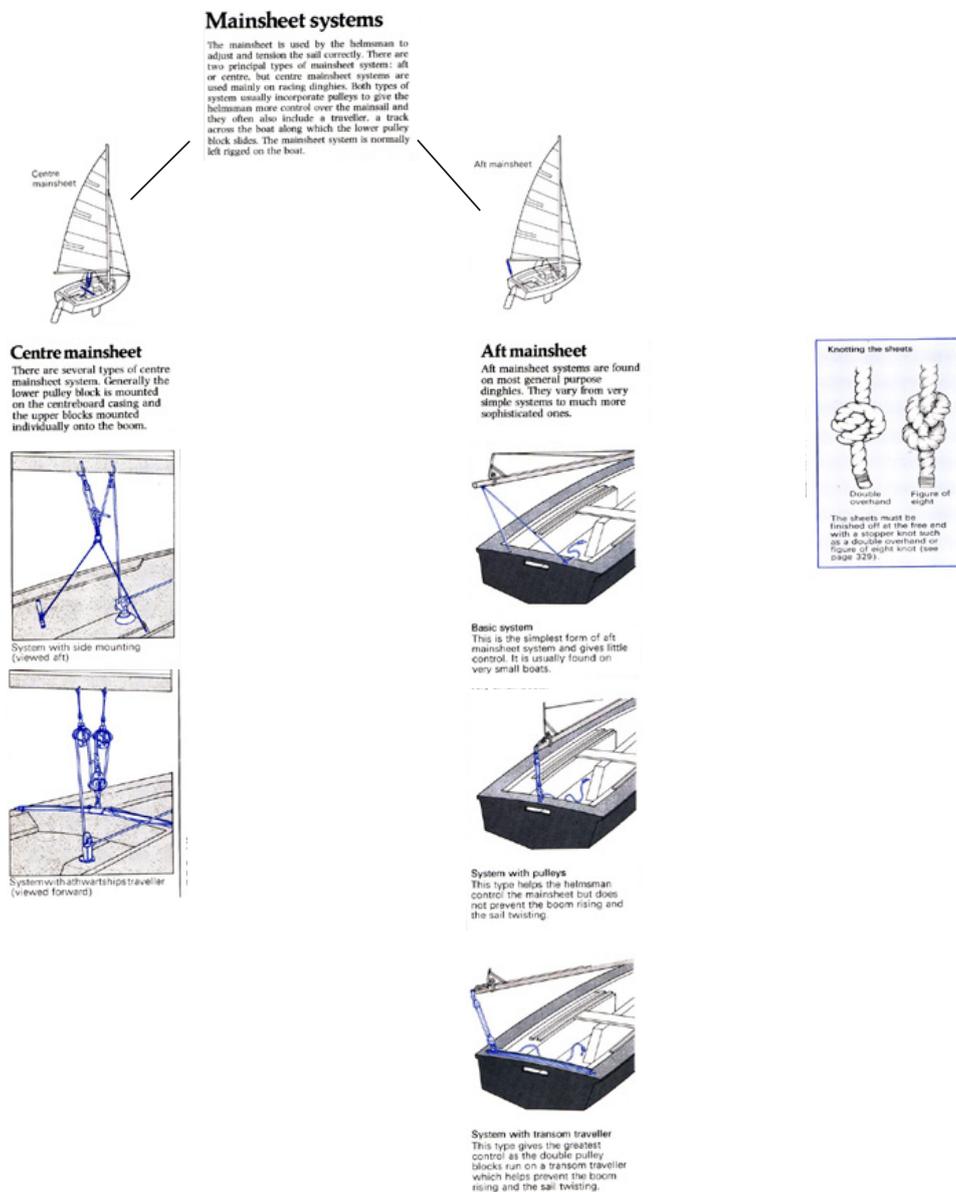


Figure 5.13 The previous figure shown as an exploded text-diagram, unconstrained by the page boundary.

Obviously this is not possible, and we must accept the constraints of the *artefact structure* of the publication, the most obvious features of which are the page size and the layout grid (Figure 5.14). Comparison of a number of pages from *The handbook of sailing* indicates that the designers have allowed themselves a choice of one-, two-, three- or four-column grids, and that these can be mixed fairly freely within each page.

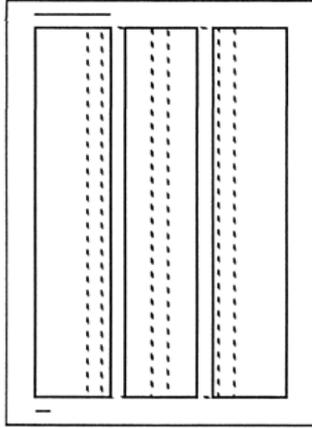


Figure 5.14 The grid probably used for *The Handbook of Sailing*.



Figure 5.15 If the two main topics on the page had been equal in length, a symmetrical two-column layout might have been possible, displaying a clearly diagrammed topic structure.

Ignoring for a moment the boxed item on knots, we can say that if the two branches of the main topic had contained the same number of elements, it would have been relatively easy to fit them onto this page in a two column format (Figure 5.15).

The two sub-topics are not equal, however, and, as we have seen, an extra item on knots has been recruited to balance the page. By including the knots item and using a three column grid, we could produce the layouts shown in Figure 5.16a and 5.16b, each of which associates the small

sketches with their correct topics, and each of which assigns equal status to the two main topics.

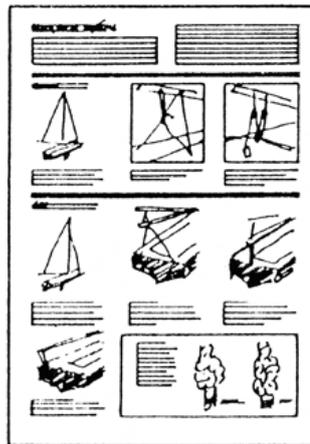


Figure 5.16a

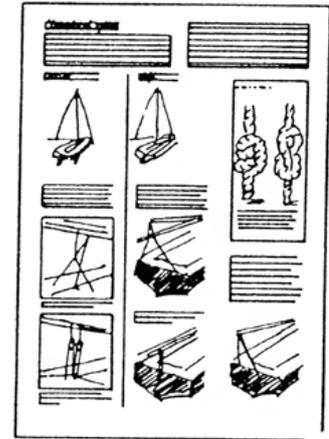


Figure 5.16b

BASIC SAILING / Rigging the jib

Rigging the jib

The jib is normally attached to the forestay with patent fastenings known as jib hanks. The jib itself is controlled by sheets attached to the clew of the sail. The sheets, which are controlled by the crew, lead around the mast, inside or outside the shrouds, to fairleads mounted on the side decks or tanks. The jib sheets are used to tension the jib correctly. Various modifications can be made to the position of the fairleads so that the angle of the jib can be altered to suit different requirements.

Shackling to the bow

The tack of the jib should be fastened to the bow fitting. This has three eyes to which the forestay, the tack of the jib and the painter are attached. Normally the forestay is attached at (1), the tack of the jib at (2), and the painter at (3) but the position of each eye varies with the design of the boat.

Fastening the hanks

Plastic or stainless steel hanks are used to fasten the jib to the forestay (shackles were formerly used). The hanks are fitted at right angles and then twisted to lock them onto the wire. The fastenings permit the jib to be raised or lowered quickly and neatly as required.

Hoisting the jib

Before hoisting the jib by pulling on the halyard, the head of the sail must be attached to the jib halyard. You should check first to make sure the jib halyard is not twisted. If the jib is not being hoisted straightaway, secure it to the forestay with a sheet. When the jib is hoisted, clear the spare line.

Fastening the jib sheets

The jib sheets are fastened at the clew with a shackle or bowline knot (see page 331). They are led through fairleads and finished off with a stopping knot (see Knotting sheets, opposite). A jamming cleat holds the sheet in position, if required.

Shackling the halyard

If the head of the sail is attached to the halyard with a D shackle, make sure the shackle pin is tightened properly so it does not loosen when the jib flaps.

Order of rigging
The order of rigging the jib is usually as follows:

- 1 Shackles to bow
- 2 Fasten hanks
- 3 Fasten sheets
- 4 Shackles head to halyard
- 5 Hoist jib

Parts of the jib

- Head
- Leech
- Luff
- Clew
- Tack

Hanks on forestay

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BASIC SAILING / Centreboards

Centreboards

Sailing dinghies are so light that their immersed areas offer little sideways resistance to wind and water. In the early days of sailing, oars or leeboards were used to prevent sideways drift but it was soon realized that a centrally placed board was most effective. In larger boats this takes the form of a fixed keel, but in sailing dinghies a retractable wooden or metal board or plate in a watertight casing provides a better solution. It can either be in the form of a simple, sliding board (known as a daggerboard) or a shaped centreboard which is pivoted at its forward end. In either case, the board can be adjusted to suit the course relative to the wind. For example, the closer to the wind the boat sails, the more depth of board is needed, whereas the further away from the wind, the less is needed (see Changing course, pages 64–5).

Adjusting the board

The depth of centreboard can be adjusted by pushing it backwards or forwards. The board pivots in a rigid, fixed casing (right). It can also be controlled by ropes attached to the side decking (below) which allows the crew to control the board without moving their position.

Daggerboard

The daggerboard is most common in very small boats as it takes up less room than a centreboard. It slides up and down in a watertight casing (below), held in position with a shock cord. Great care should be taken when the board is fully retracted or the boom may hit it.

Rowing and paddling

There will be a number of occasions when you may need to row or paddle your dinghy. Different methods of paddling are used according to the number of people and the position of the sails. With one person paddle over the stern with the sails down and the rudder stowed (right). (For paddling with two people, see page 77.)

How to row

- 1 Lean forward with arms extended.
- 2 Dip blades into water and straighten body, pulling on oars.
- 3 Complete stroke by leaning back and pulling arms into chest.
- 4 Push hands down to lift blades out of water and repeat from step 1.

Paddling stern first
Move the paddle from side to side, twisting it at the end of each sweep to draw the boat along.

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Figure 5.17 Two of the pages that accompany the one shown in Figure 5.12.

The key to the layout is found in its *access structure*. If we are able to view the ‘Mainsheet systems’ page in the context of other pages with which it appears (Figure 5.17), we can see that the top third of most of these pages follows a consistent pattern (Figure 5.18).

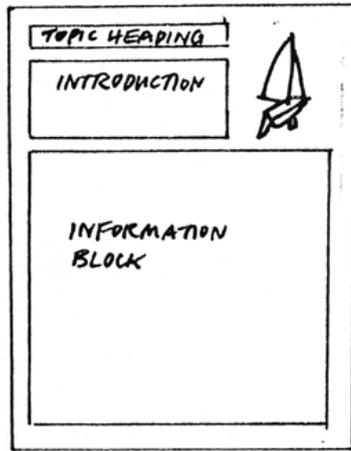


Figure 5.18 The consistent access structure of these pages

Each of these pages¹¹³ contains a topic heading, an introductory paragraph and an identical drawing of a dinghy on which the location of the topic is highlighted in blue. The apparently ‘ideal’ shape for the topic has thus been traded against the need for consistency in the access structure. Within what in Figure 5.18 was termed the ‘information block’, there is a further consistency in the typographic treatment of text components. Roughly speaking, they are specified as follows:

Page-level heading	22pt roman bold
Intro	10pt roman
Heading	14pt roman bold
Main text	8pt roman
Caption heading	8pt sans serif bold
Caption text	8pt sans serif
Running head & folio	10pt roman

Genre and textuality

The model proposed here implies the replacement of a coding model of communication with one that recognizes a greater role for inference and interpretation. Another way of expressing this is suggested by Eco (1976) who, citing the Soviet linguist Lotman (1969), distinguishes between *grammar-oriented* and *text-oriented* cultures. While grammar-oriented cultures are governed by a system of rules, text-oriented cultures are governed by a repertoire of texts, imposing models of behaviour – in effect, genres.

.....

113 It should be stated that I have selected these pages for the purpose of demonstrating a principle. In reality, the consistent access structure shown in Figure 5.18 only extends across a limited set of pages.

The analysis of *The handbook of sailing* demonstrated some aspects of this distinction between grammaticality and textuality – I tried to show how ‘grammatical’ expectations about the display of topic structures were modified by the circumstances in which they were displayed. The following brief analysis of two examples of another genre, paperback book covers, demonstrates a wider range of factors that have been associated with textuality.

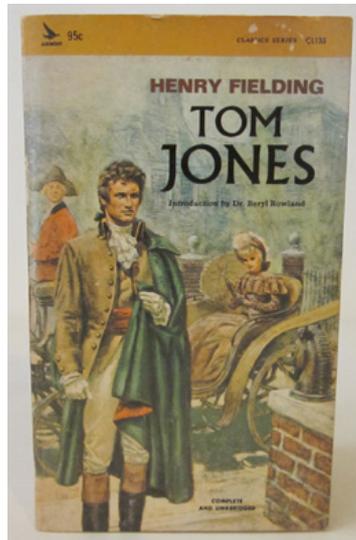


Figure 5.19

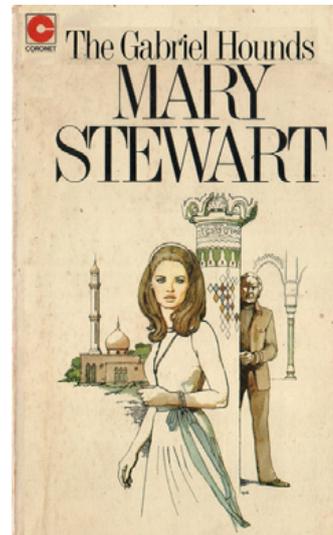


Figure 5.20

Figures 5.19 and 5.20 represents the jackets of two books in my home. I correctly interpret the first as a book called *Tom Jones* by an author called Henry Fielding. I may have deduced that from a typographic rule that, in the absence of a specific statement that ‘This is a book called such-and-such, by an author called so-and-so’, the title is printed larger than and below the author’s name. Or I may have deduced it from my prior knowledge that there is an author called Henry Fielding. Those who have not heard of this author would be entirely blameless if they misunderstood this title.¹¹⁴

If I applied the typographic rule to Figure 5.20, though, I should be puzzled to find a book called *Mary Stewart* by The Gabriel Hounds. The fact that I don’t is not due to the fact that I have heard of an author called Mary Stewart (I had not), but because I know that dogs can’t write. I therefore rejected the typographic rule and added to my general knowledge the fact that there is a famous author of that name.

We can apply the same principle to the interpretation of a simple sentence such as ‘The cat sat ___ the mat’, Our identification of the missing word as ‘on’ is not just a matter of parsing the grammar of the sentence,

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¹¹⁴ I have experienced problems of a similar kind when trying to determine which of several parts of a foreign-language letterhead contains the address, particularly if there are no words I recognize, like *Rue* or *Straße*, and given the different conventional order of street, city and district in some countries.

determining that a preposition is needed and selecting one at random. We also use common sense to reject unlikely options. ‘The cat sat on the mat’ resembles a reading primer cliché. If the subject had been human, we might have guessed quite differently: ‘mending’ or ‘weaving’, for example.

These two approaches to language interpretation have also been described as *linguistic* and *ethnomethodological* (Widdowson 1979). While a linguist might look for logical rules linking linguistic signals and patterns to meanings, to be shared by the creator and interpreter of a document, the ethnomethodologist is more interested in the practical reasoning that occurs on an actual occasion of language use (in this case, in a library or bookshop) – reasoning that usually goes beyond knowledge of language to include all our knowledge of social interaction.

De Beaugrande & Dressler break textuality down into seven standards that characterize actual texts. Table 5.2 lists them in table form to demonstrate why, using practical reasoning, we still understand the cover of the Mary Stewart book in spite of an apparent breakdown of the first (grammatical) standard, cohesion.

<i>Standard</i>	<i>De Beaugrande & Dressler's explanation</i>	<i>My application to Figure 5.20</i>
Cohesion	Grammatical dependencies on the [text] surface.	Title is usually larger than author, but...
Coherence	Conceptual dependencies in the textual world.	‘The Gabriel Hounds’ is less likely to be an author than ‘Mary Stewart’. Her name is emphasized because...
Intentionality & Acceptability	The attitudes of the participants towards the text.	We know the publisher wants to stress the information that will sell most books. We want to choose a book.
Informativity	The incorporation into the new and unexpected into the old and expected.	Here is a new book by a well-known author.
Situationality	The setting.	The cover is on a book which is for sale.
Intertextuality	The mutual relevance of separate texts.	The illustration, title and blurb identify it as of the romantic fiction genre.

Table 5.2. Seven standards of textuality, based on de Beaugrande & Dressler (1981: 37).

These seven factors bring together things found in the text and things outside it, and thus form a useful account of what readers expect to find in actual texts. They represent categories of expectations which we bring to real texts in real situations, and consequently they are characterized by the flexibility of heuristics rather than the rigidity of grammar. In the case of

the romantic novel, one apparent surface meaning is overridden by several other kinds of expectation and prior knowledge about books, literary genres, authors and publishers.

In the next three chapters I shall look in more detail at the nature and interaction of topic structure, artefact structure and access structure, before moving on to consider, in Chapter 9, the concept of genre.

6

Topic structure

In the last chapter I proposed a model of typographic communication in which the visible structure of particular texts reflects three kinds of underlying structural imperative, each stemming from a different part of the writer-text-reader relationship, and whose integration is managed by a fourth structure which I called conventional, or genre structure. In this chapter I shall explore the first of the three, topic structure, in more detail.

Whatever their ultimate motives – to inform, educate or persuade – authors of non-fiction texts are also trying to order their ideas, and this chapter explores the extent to which such ordering may be signalled through typography and layout. That is not to say that page layouts can often represent ‘knowledge structures’ in a direct sense – we have already noted the constraints imposed by the linearity of language – but the example briefly considered in Chapter 5 (Figure 5.12) indicate that there may be considerable potential for topic structures to be reinforced by their graphic arrangement.

In the distinction between topic and access structures lurks a danger that should be acknowledged at the outset: it may be taken to imply that information can be encoded in a pure form, unadulterated by considerations of audience. In the present context, though, the distinction between topic and access structures is largely a theoretical construct, convenient for the organization of the argument. The progression from topic structure to access structure via artefact structure may be seen as a vehicle to demonstrate the replacement of the transport metaphor for written language with a context-bound and audience-related model in which typography plays a key role. The notion, implied by topic structure, that topics can be easily encoded is complicated by the recognition of the role of the artefact, and further broken down when we consider the role of the reader.

Nevertheless, perhaps because of the prevalence of Reddy’s ‘conduit’ metaphor in everyday language, many writers do appear to see texts as autonomous expositions of ideas. Sticht (1985), for example, attributes the failure of technical manuals to communicate effectively to an excessive degree of topic-orientation. The technical writers surveyed by Kern & Sticht (1974) saw their task as simply one of assembling and recording all that is

known about their topic. A major problem of manuals is identified by Sticht as a tendency by their writers to see school textbooks as a model of good writing. He argues that, whereas textbooks traditionally seek to display the logical connections between ideas, manuals are used by a wide range of people in association with job-related tasks.

Olson (1980) identifies the textbook form as an example of the *archival* form of written language, which he distinguishes from the *communicational*, which, presumably, includes notes to the milkman, personal correspondence and the like. The implication is that the textbook form contains explicit and context-free meanings and is thus relatively autonomous. Olson does not claim that archival texts do not communicate, but that they ‘preserve their meanings across speakers and situations’. His theory of autonomous text is discussed more fully in subsequent chapters, but for now we may simply note that, in practice, most uncontroversially archival texts such as dictionaries and manuals are able to communicate because their context, source, status, range of possible readers and organizational principles are made explicit through typographically signalled means.

Olson’s terms are similar in intent to the distinction drawn in Chapter 3 between ‘fact structure’ and ‘argument structure’. There may be cases where the facts have some inherent order of their own, and others where the writer may have reason to prefer one arrangement to another. However, the term ‘topic structure’ enables us to circumnavigate these distinctions altogether for the time being, since it simply refers to whatever the writer wishes to talk about. Following Grimes (1975: 337), the topic of a text may be defined as ‘that part of the surface form that represents the speaker’s thematic choice’¹¹⁵ – whether that form represents a fact structure, an argument structure, or one of the other distinctions that arise in the literature of linguistics, psychology and education – topic and comment, language and metalanguage, for example. To talk of ‘topic structure’, then, enables us to avoid some of the trickier philosophical questions concerning the structure of knowledge and to confine our interest to those aspects of structure that can be made visible through typography, while still, following Grimes, concentrating on the *writer’s* thematic choice. Texts seen as topic structures represent the writer’s communication goals organized in the form of arguments, which in turn are expressed at the text surface through verbal language, pictures and typographic layout.

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¹¹⁵ The word ‘topic’ is linked to the speaker’s choice of theme and the surface form of language, through its origins in the Greek word *τοπος*, a place (see Chapter 4, footnote 101). Topics are metaphorical places (ie headings) in which arguments can be found.

Visual and spatial metaphor

The distinction between fact and argument structures might in any case be minimized by the abundance of visual and spatial metaphors in the literature of linguistics and semantics. For example, the literary critic Northrop Frye (1957: 335) talked of the link between logic and rhetoric – or, we might say, a topic and the way it is addressed to an audience – as

‘“doodle” or associative diagram, the expression of the conceptual by the spatial... If a writer says “But on the other hand there is a further consideration to be brought forward in support of the opposing argument,” he may be writing normal (if wordy) English, but he is also doing precisely what an armchair strategist does when he scrawls plans of battle on a tablecloth. Very often a “structure” or “system” of thought can be reduced to a diagrammatic pattern – in fact both words are to some extent synonyms of diagram.’¹¹⁶

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Rather than advocating a literal expression of the conceptual by the spatial, Frye is actually addressing the function of metaphor in non-literary prose. He is concerned that in the effort to ‘purify verbal communication from the emotional content of rhetoric’, prose becomes, paradoxically, less clear not more.¹¹⁷

Analogy and metaphor allow us to discuss argument structures as if they were fact structures. Instances of spatial metaphor in the technical vocabulary of linguists suggest that it might be possible to identify graphic techniques that break away from the hierarchical norm but that still correspond more or less directly to ways in which we are accustomed to organizing words and ideas.

Nash (1980), for example, suggests four kinds of ‘rhetorical design’ which, he argues, are fundamental to all composition (although usually found in combination). Nash’s categories – the Step, the Stack, the Chain and the Balance¹¹⁸ – may all be interpreted as visual metaphors,.

The *Step* is the easiest one to identify in graphic form. Indeed, Nash suggests that his example (a set of instructions) is an instance of

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116 We sometimes talk metaphorically of writers ‘mapping their domain’ and this suggests a happy coincidence in the similarity of the words ‘typography’ and ‘topography’. As a student of the former I was sometimes assumed by others to be studying the latter. The misunderstanding might have been reinforced by the fact that the geography and typography departments shared the same building.

117 Although Frye does not develop the idea in depth, Lakoff & Johnson (1980a) have built a cognitive theory around their wide-ranging exposition of the pervasiveness of metaphor in everyday thinking. Besides the transport, pipeline, or conduit metaphor for communication, mentioned in Chapter 5, other everyday metaphors identified by Lakoff & Johnson include *Time is money*, exemplified by ‘you’re *wasting* my time’ or ‘how do you *spend* your time these days?’; *Argument is war*: ‘your claims are *indefensible*’, ‘he *shot down* all my arguments’.

118 Nash’s book *Designs in prose* is written in textbook form – that is, with student exercises and a general reading list but virtually no citations. It is therefore hard to see how his ideas fit into the general linguistics scene. Although two of his categories of rhetorical design are similar to those of Grimes (1975), they are probably independent. Nash’s four varieties of rhetorical design form the basis of Quirk *et al*’s treatment of discourse strategies in their authoritative *Comprehensive grammar of the English language* (1985: 1435).

‘programming’ (see Chapter 4), and ‘could well have been laid out as separate and perhaps numbered sentences’ (p. 9). An example of a stepped rhetorical design reflected in typographic layout can be seen in the section headed ‘Sail onto boom’ in Figure 6.1.

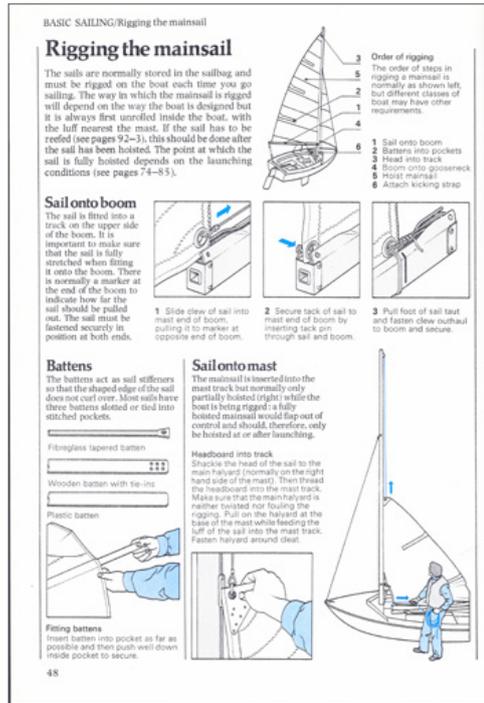


Figure 6.1 The three numbered procedures in the section entitled ‘Sail onto boom’ are in a *stepped* relationship.

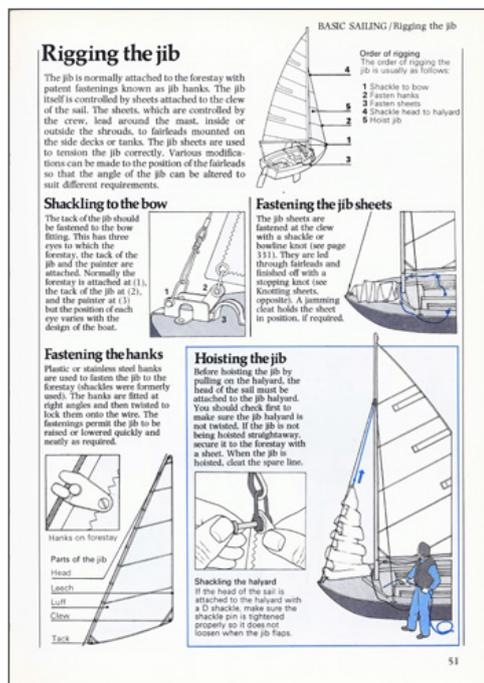


Figure 6.2 The stepped relationship between the elements of this page is indicated by the schematic drawing (top right). However, it is not particularly well reflected in the layout (see comments in text below)

However, we might puzzle over the less clear relationship between rhetorical and graphic design in Figure 6.2. Although the schematic drawing at the top right-hand corner of the page has ‘Shackling head to halyard’ as step 4, preceding step 5, ‘Hoisting the jib’, the layout seems to treat step 5 as a separate topic from steps 1–3, and step 4 as a comment on step 5. In both Figure 6.2 and Figure 6.1 the clearly stepped design is diluted by the failure to repeat the enumeration of the steps in the sub-headings; furthermore, the wording of the sub-headings is not consistent with the steps as announced in the schematic summary drawings.

A *stack* design is characterized by the announcement of a topic, followed by a series of amplifying or explanatory comments. Stacks are, in effect, *lists* of attributes or comments, and may be graphically treated as such. Figure 6.3 contains a small stack of ideas relating to the topic ‘rudder and tiller’: ‘parts of the rudder’, ‘fitting the rudder’, and ‘tiller extension’ (there seems no reason why this should not have a more prominent heading). Grimes (1975: 245-6) discusses a similar rhetorical pattern, the *star*, whose name also suggests a graphic form. The star is a pattern of persuasive argument in which a number of independent points contribute to a central conclusion.

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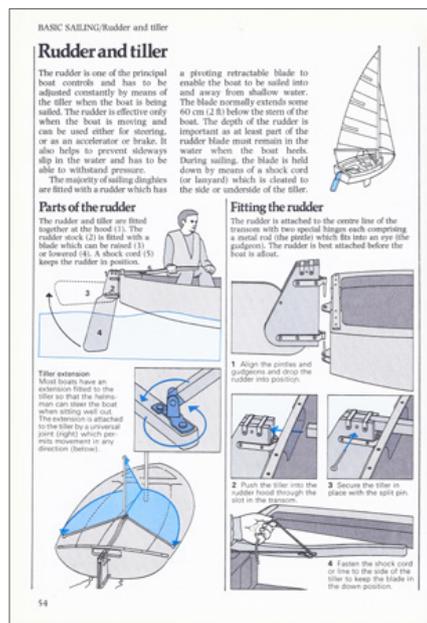


Figure 6.3 With the exception of the stepped sequence under ‘Fitting the rudder’, most of this page consists of a *stack* of information about its topic.

Of his four rhetorical designs, Nash’s *chains* are the least amenable to graphic treatment since, as the metaphor suggests, they are essentially linearized. As he puts it,

‘the writer’s procedures are less *predictive* than *exploratory*; he works through the expository maze, seeing no more than a sentence ahead, placing his trust in the clues afforded by syntactical or lexical connections.’

So whereas each sentence in a stacked paragraph takes the same initial topic sentence as its point of departure, chained sentences simply relate to their immediate predecessors. In view of this apparent lack of pre-planning it is hard to see why Nash includes chains as ‘designs’ at all. Judging by his examples, chain structures are more characteristic of literary prose than expository or technical information.

Balanced rhetorical patterns present contrasting viewpoints – proposition and counter-proposition. The Balance would appear to be easily reflected in layout – the point-by-point comparison of two (or more) contrasting options can be easily made in a table, for example. Indeed, the bilateral symmetry implied by the term ‘balance’ points to an advantage of graphic formats over prose – complex comparisons can be made in a considerably more orderly way.¹¹⁹ In prose, Nash suggests that balance is often more apparent than real – the writer may simply want to give the appearance of considering both viewpoints, while moving us gently towards his or her preferred view.

In ordinary discourse, Nash suggests,

‘there is a programme of assertions, examples, qualifications, but these are not presented as a series of distinctly labelled positions. Instead, they are related to each other in a progressively unfolding pattern, the turns and connections of which are demonstrated in various ways: sometimes by means of syntactic devices, sometimes through the kinship of elements in vocabulary, sometimes by the management of punctuation and typography.’ (p. 6–7)

However, although Nash thus includes typography among the structuring techniques available to writers, bracketed with punctuation, he does not provide any detailed guidance.

In practice, the main provision for the typographic signalling of topic structures in most publishers’ style guides is for hierarchical structures of headings and sub-headings. A typical hierarchy might provide for chapter headings, and three levels of sub-headings, perhaps termed A, B and C headings. In effect, a single graphic technique must serve for a variety of rhetorical purposes. Arguments may be represented as hierarchical structures, even when the ‘ideal’ text-diagram might be rather different.¹²⁰

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119 Support for this view may be found in the outcome of an experiment recently reported by myself and my colleague Peter Whalley (Waller & Whalley 1987). We tested two prose versions and a tabular arrangement of a balanced argument comparing aspects of psychoanalysis and behaviour therapy. One prose version presented each side of the argument separately, while the other interwove both viewpoints in an integrated fashion. A previous study (by Schnotz 1982) had supported the hypothesis that the separated prose version would result in a sound comprehension of each therapy, but would inhibit the coherent integration of the two points of view (and vice versa). We confirmed our own hypothesis that a tabular arrangement would disadvantage no one, since it would allow readers to choose an appropriate strategy for their purpose.

120 The idea that texts are sets of hierarchically related propositions underlies a great deal of research into text comprehension. See the review by Meyer (1985).

Since topic structures do not always correspond to the structures implied by the hierarchical typographic arrangement enforced by the norms of book publishing (or to any simple, easily diagrammed structure, for that matter), the exact relationships between major points in an argument must usually be specified in some other way – as Nash suggests, through syntax or parallelisms and other ‘kinships’ in vocabulary. Interestingly, there is a noticeable similarity between Nash’s fourfold classification of rhetorical designs and a distinction between four kinds of verbal conjunction made in Halliday & Hasan’s (1976) important account of linguistic cohesion in English texts (Table 6.1). So although Nash’s categories simply seemed to be a useful starting point for this discussion because of their metaphorical names, confidence in them is enhanced by close parallels with other classifications suggested independently by scholars in related contexts. In another context still, the psychology of text comprehension, Meyer’s categories of rhetorical structure are converging in a similar way. She has recently conflated her original eighteen categories (Meyer 1975) into five categories that on examination bear a close relationship to Halliday & Hasan’s: *collection*, *description*, *causation*, *problem/solution*, and *comparison* (Meyer 1985).

<i>Nash's rhetorical designs</i>	<i>Halliday & Hasan's conjunctive relations</i>	<i>Examples of conjunctive adjuncts</i>
Step	temporal	first, then, next, finally
Stack	additive	and, furthermore, for instance
Chain	causal	so, because, consequently
Balance	adversative	but, however, on the other hand, rather

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Table 6.1 A comparison of Nash’s rhetorical designs and Halliday & Hasan’s conjunctive relations¹²¹

Although *conjunction* is just one of Halliday & Hasan’s five kinds of ‘cohesive tie’, it is of special relevance to the present study. Whereas the other four – *reference*, *substitution*, *ellipsis* and *lexical cohesion*¹²² – are

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¹²¹ Halliday & Hasan’s taxonomy of conjunctive relations is considerably more elaborate than is represented here. Each major type of relation is divided into ‘external’ and ‘internal’, and further subdivided as appropriate. The examples of conjunctions shown here are from external categories – a reason for this is discussed below.

¹²² The distinction between the other four categories is a subtle one. *Reference* might be exemplified by ‘Three blind mice. See how they run’, where ‘they’ refers to ‘mice’. *Substitution* is exemplified by ‘My axe is too blunt. I must get a sharper one’, where ‘one’ substitutes for ‘axe’. Reference is a semantic relation, while substitution is a grammatical relation between linguistic items – whereas the first example could be reversed, so that ‘they’ refers ahead (‘See how they run, the three blind mice’), the same cannot be said of substitution (‘I must get a sharper one, because my axe is too blunt’ is grammatically unacceptable). *Ellipsis* is described as ‘substitution by zero’, as in ‘Joan bought some carnations, and Catherine some sweet peas’. *Lexical cohesion* is superficially similar to substitution. Where the latter relies on a set of neutral terms (like ‘one’, or in the case of this sentence, ‘the latter’), lexical cohesion

embedded in the internal structure and wording of sentences, conjunction is normally achieved through separate, identifiable ‘adjuncts’ – words and phrases. Halliday & Hasan explain that

‘conjunctive relations are encoded not in the form of grammatical structures but in the looser, more pliable form of linkages between the components of a text’ (p. 321).

So if cohesive relations can be displayed through typography, itself a means of linking text components, they are most likely to be of the conjunctive kind. It should be remembered, of course, that Halliday & Hasan are for the most part interested in relatively short-range relations, typically between pairs of sentences, rather than the structure of extended arguments. Any extended prose passage will contain a variety of cohesive ties from many of their different categories and sub-categories. But the sort of relations or structures found typographically signalled in the *Handbook of sailing* examples are usually less subtle than those in a typical page of prose. They relate to broad structures found (or imposed) within the page’s topic.

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Figure 6.4 The identical frame-size of these four methods of carrying a boat, and the absence of a linear sequence of their arrangement, is suggestive of ‘or’ conjunctions – classed by Halliday & Hasan (1976) as an *additive* conjunctive relation (of the sub-category ‘alternative’).

Additive relations can be seen as inclusive of Nash’s stacks (Figure 6.3). Figure 6.4 gives a further example. *Temporal* relations can be seen in terms of steps (Figure 6.1), although the latter may have causal links also. However the apparent similarity between the Nash and Halliday & Hasan schemes becomes rather more blurred when one examines the equivalence of chain & causal. From Nash’s statement that each sentence in a chain takes its predecessor as a point of departure, we can see chain relations as

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 does not so much substitute as reiterate with a lexically related expression. The following example includes two instances of lexical replacement, ‘children’ and ‘food’: ‘Patrick and Theresa won’t eat their macaroni. Why are children so fussy about their food?’.

being both causal and additive. Given our present interest in information rather than literary texts, ‘causal’ is a rather more useful category than ‘chain’, although it is no easier to show graphically.¹²³ The equivalence of balance & adversative is also not straightforward, since Halliday & Hasan class balanced constructions as either adversative or additive, according to whether they refer to *external* contrasts (that is, contrasts in the fact structure) or *internal* contrasts (in the linearized argument structure).

A problem emerges from this brief comparison of two categorial frameworks. Halliday & Hasan’s four categories only correspond to Nash’s if we select their external (*fact* structure) examples. But this is the opposite of what we might expect when we recall that Nash’s purpose is to classify not fact structures but *argument* structures. The answer lies in the highly metaphorical character of Nash’s categories – although he is describing argument structures, he uses the vocabulary of fact structures to do so.

If we look more closely at this vocabulary of fact structures in the context of semantics, once again we find a high degree of visual, or at least visualizable, metaphor. Table 6.2 lists the lexical ‘sense relations’ discussed by Lyons (1977). Other textbooks (for example, Leech 1981) use similar terms.

Contrast

Binary opposites

gradable (eg, hot/cold)
 non-gradable (eg, male/female)
 converse (eg, husband/wife)
 directional (eg, North/South, up/down)

Non-binary sets

Serially ordered
 gradable scales (eg, poor...fair...excellent)
 non-gradable ranks (eg, private, corporal...field marshal)
 Cyclical (eg, ...spring, summer, autumn, winter, spring...)

Hierarchy

Class inclusion (eg, animal: cow, sheep, etc)
 Part-whole relations (eg, body: arms, legs, etc).

Table 6.2 Sense relations in vocabulary (abstracted in table form from Lyons, 1977, Chapter 9).

Many of these sense relations are suggestive of visual metaphor, and it is quite easy to find a number of them graphically displayed in the *Handbook of sailing*. Figures 6.5 to 6.10 show examples of those compatible with the segmented character of typography.¹²⁴

.....

¹²³ The link between ‘causal’ and ‘chain’ is reinforced by Grimes (1975: 246), who discusses chain patterns in rhetoric using causal examples.

¹²⁴ Examples of the two gradable categories are not shown, since by their nature they are incompatible with the segmented (ie, non-gradable) character of typography. They can be found in diagrams, though. For example, the illustration at the bottom right of Figure 6.2 shows a sail in the process of being



Figure 6.5 **Binary contrast, non-gradable**: the use of parallel columns is a typical way of showing an either/or relationship. The use of a different typeface for the main text vs caption relationship could be seen as an example of a **converse** binary contrast.

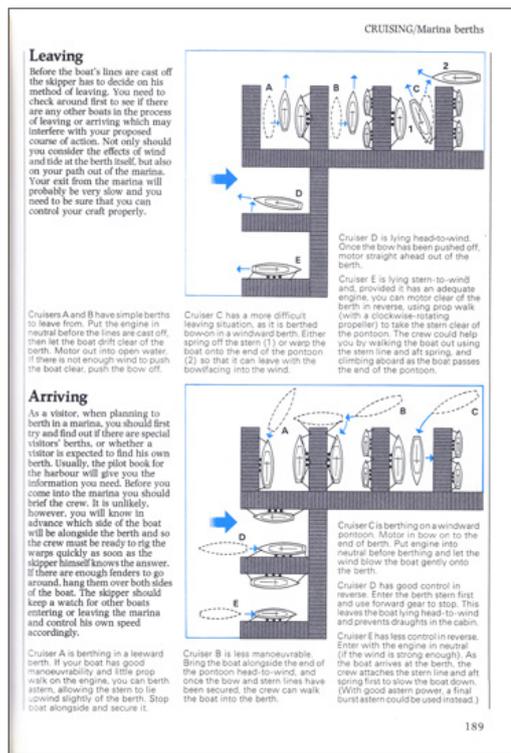
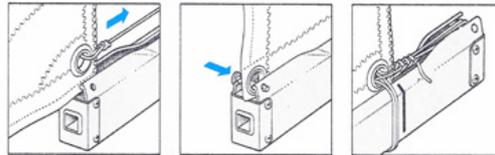


Figure 6.6 **Binary contrast, directional**: here the order in which topics are presented reflects the directional or temporal order of topic – when taking a trip in a boat, you leave before you arrive back. In a different topic, it might have been more appropriate for *arriving* to precede *leaving*, the convention being to show temporal progression in terms of the norms of the writing system; that is, from left to right, top to bottom, in English. Other conceptual relationships are assigned directionality by metaphor: senior people thus rank *above* or *before* junior ones, and so on.

.....
 hoisted – the binary contrast displayed is ‘up vs down’; the infinite number of intermediate grades are hinted at by the obvious motion of the sail (indicated by the arrow and the person pulling on the rope).

Sail onto boom

The sail is fitted into a track on the upper side of the boom. It is important to make sure that the sail is fully stretched when fitting it onto the boom. There is normally a marker at the end of the boom to indicate how far the sail should be pulled out. The sail must be fastened securely in position at both ends.



- 1 Slide clew of sail into mast end of boom, pulling it to marker at opposite end of boom.
- 2 Secure tack of sail to mast end of boom by inserting tack pin through sail and boom.
- 3 Pull foot of sail taut and fasten clew outhaul to boom and secure.

Figure 6.7 **Non-binary sets, serially-ordered non-gradable:** The numbered sequence is an obvious example.

Rowing and paddling

There will be a number of occasions when you may need to row or paddle your dinghy. Different methods of paddling are used according to the number of people and the position of the sails. With one person paddle over the stern with the sails down and the rudder stowed (right). (For paddling with two people, see page 77.)

How to row

- 1 Lean forward with arms extended.
- 2 Dip blades into water and straighten body, pulling on oars.
- 3 Complete stroke by leaning back and pulling arms into chest.
- 4 Push hands down to lift blades out of water and repeat from step 1.

Paddling stern first
Move the paddle from side to side, twisting it at the end of each sweep to draw the boat along.

Figure 6.8 **Non-binary sets, cyclical:** In this case the cycle is indicated by using the same illustration for step 4 as for step 1. An alternative might have been to arrange the steps into a circle, but this arrangement is particularly suited to the subject – the progress of the boat through the water.

ADVANCED SAILING/Alternative forms of racing

Alternative forms of racing

Boat-for-boat racing in one-design and restricted development classes provides exciting racing, but there are other forms of racing which are equally popular and in some cases more common. Colleges, universities and many clubs often organize team racing, where the object is for the team rather than the individual competitor to win. This provides a quite different type of racing, involving an increased use of tactics and placing less emphasis on faster sailing. Many club races are organized on a handicap system so that several different types of boat may race together. This is popular with regatta committees who want to see as many boats competing as possible. The most individual form of racing is match racing, which is conducted between two boats. The America's Cup is probably the best known match racing event.

Team racing

Team racing, shown right, is usually organized between two teams of three or four boats in the same class. A match usually consists of two races, with the teams exchanging boats in between the races. The object is for the team, rather than the individuals, to win. Because of the scoring system, it is not necessary for a team to have first place to win the race. Thus the emphasis is less on individual prowess and boat speed and more on tactical ability. A good knowledge of the rules is vital and it is essential to be able to evaluate the overall position of your team at any time, as this will determine your tactics. For instance, if you are in second place with your team mates in fourth and fifth places, you will know that this is a losing combination and you will have to attack the opposition. The easiest way to improve your position is to try to slow down the boat in third place so that your team mates can pass him. This will give you second, third and fourth places – a winning combination. Team racing is, without doubt the best way to improve both your boat handling and knowledge of the rules.

Team racing in Enterprises. E19402 is helping a team mate pass E19538 by allowing its jib to flap, thus disturbing the airflow reaching E19538.

Handicap racing

Handicap racing is common in clubs where no one class has enough boats to make single class racing worthwhile. But it is more usual for clubs to organize separate starts for their single class fleets and then to have a start for a handicap fleet to cater for those members who own boats other than those regularly raced. The most widely used handicapping system is based on "yardstick" numbers which are given to each class of dinghy. When a mixed fleet of dinghies races, the time each boat takes to complete the course is recorded and, by using a set of tables, a corrected time in relation to the yardstick numbers is worked out, giving the finishing positions. The yardstick numbers are corrected as evidence is built up from the information supplied by clubs to try to make the handicap system more accurate. In addition to handicapping classes of boat, some clubs handicap individual helmsmen. At the start of each season a helmsman with a proven consistent record is given the "scratch" rating. The other helmsmen are awarded handicaps around this level on the basis of their known ability. After each race the handicaps are adjusted.

Match racing

Match racing is a classic form of racing between two boats of the same class. It is often conducted in the form of a series of races between pairs of competitors making up a tournament. Each competitor must race against every other competitor and the overall winner is the one with the most wins. The match race really starts five or ten minutes before the actual start of the race as the two boats come together and attempt to get the best position for the start proper. The boat winning the start has a decided advantage and can control the other boat from ahead. However, as match racing is often very close, one bad tack can lose the race for the leading boat.

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Figure 6.9 **Hierarchy, class inclusion:** The classic hierarchy, indicated by a hierarchy of headings of varying prominence.

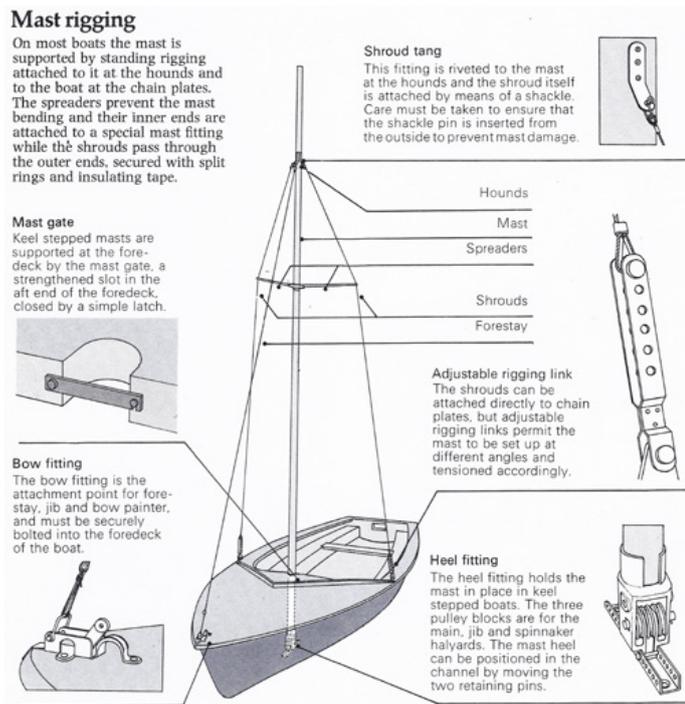


Figure 6.10 **Hierarchy, part-whole relations:** part-whole relations may be shown by a simple typographic hierarchy, or, as in this example, it may be possible to combine the pictorial and verbal modes to indicate the position of the parts within the whole.

Since the scope of all classifications is related to their purpose, it is understandable that some of Lyon's sense relations do not have a direct equivalent in graphic displays, and that some graphic conventions do not find a place in this list. And it is noticeable that some semantic relations work better than others within the rectilinear conventions of typographic layout. In particular, non-gradable sets (equivalent to Nash's steps and balances) are easily chunked and therefore tabulated or split into columns. Gradable sets, on the other hand, can be described in linear prose or by recourse to a separate diagram but with difficulty through layout alone.

The linearity of language is rarely an obstacle to the connection of concepts at the sentence level. Halliday & Hasan's cohesive ties, for example, usually create links between sentences which are both physically close and available in short-term memory. But when a link is to be made across many pages rather than just a few sentences, language alone strains to compensate for its own linearity. Subtleties of sentence construction or inflection no longer suffice, and authors usually introduce 'metalinguage' – whole sentences or paragraphs in which they step back from their argument and comment, seemingly objectively, on its progress. At this metalinguistic level some writers prefer to break out of the linear mode altogether and use graphic techniques. Diagrams are often used, particularly in textbooks, to help readers overview the author's argument (Figure 6.11).

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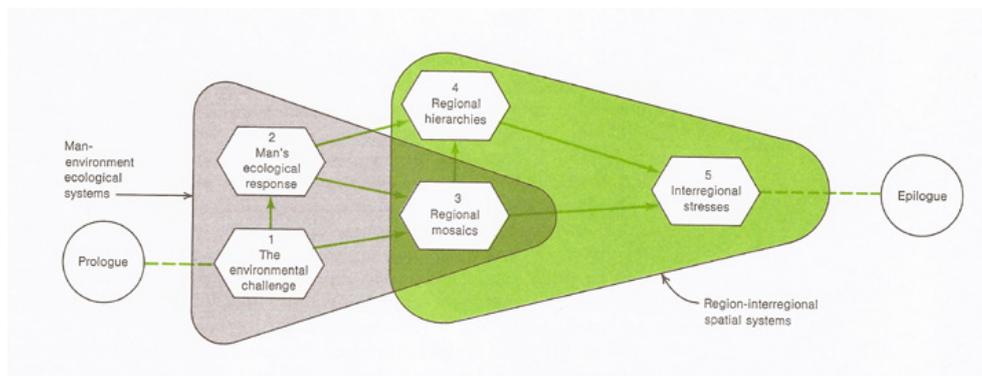


Figure 6.11 Part of a structural diagram included in a geography textbook (P. Haggett, *Geography: a modern synthesis*, 2nd edition, London: Harper & Row, 1975).

Whether readers actually use or benefit from such diagrams is still an open question among educational psychologists. Jonassen and Hawk (1984) have tested similar ‘graphic organizers’ and found advantages for immediate but not delayed recall. It is possible that training is needed to make use of such devices. Indeed, lack of familiarity with diagrams is suggested by Holliday (1976) as a possible explanation of his finding that where the ‘information’ in the diagram was accompanied by the same ‘information’ in prose form, readers preferred the familiar prose version. However, experiments which oblige readers to study in controlled conditions cannot measure how effective these devices are for less formal purposes such as browsing or revision. And in the absence of a basis for comparing the content, complexity and style of diagrams, it is difficult to generalize from particular studies.

Table 6.3 was the outcome of an informal survey of diagrams in Open University and other textbooks (Waller 1981), part of an attempt to encourage authors of continuing education courses to make more use of graphic design in their work.¹²⁵ The courses, which cover subjects of general adult interest such as consumer choice, health, parenthood and retirement, were intended to be easy to read and were to some extent modelled on home reference manuals such as *The handbook of sailing*. The table was intended to alert authors to opportunities for displaying their ideas graphically, and the categories bear some relation to Lyons’.

.....

¹²⁵ Wright (1985: 93) comments, on the basis of a study of writing and editing, that ‘few amateur writers appear to introduce illustrations spontaneously, even when describing the rules of a board game such as draughts’.

<i>Relationships displayed</i>	<i>Examples</i>
Categorial	
discrete	simple lists
hierarchical	chains of command, taxonomies, hierarchical lists
overlapping	Venn diagrams, matrices
comparative/contrastive	continua, parallelisms, reflections and other symmetrical or axial graphic structures
Dynamic	
temporal	calendars, time-lines
serial	non-temporal series of events or processes, including cycles
causal	algorithms, feedback charts, some operating instructions
cumulative	recipes, production process/flow charts where a given feature acquires new characteristics as a result of inputs and interactions
Spatial	
locational	town plans, 'physical' maps
territorial	organizational charts, 'political' maps
networks	route maps, circuit diagrams

Table 6.3 Semantic structures displayed by various genres of network diagram
(From Waller 1981).¹²⁶

Table 6.3 classifies topics for diagrams rather than typographic layouts. But since they are almost completely unconstrained by the conventions of linear-interrupted written language, diagrams provide instances of graphically-realizable topic structures in a relatively pure form. And there is a sense in which we can view typographic layouts in terms of 'text-as-diagram' (Waller 1982, 1985).

As Michael Evans (1980) has shown, such diagrams have a long history. The medieval preoccupation with order and especially geometry made diagramming a particularly suitable medium for recording scholastic analysis. Evans describes the use of branching diagrams ('stemmata' is Evans' term), geometric diagrams, and visual metaphors such as trees, wheels, towers and ladders. He includes the diagrammatic use of page layouts in his account:

'A different size of initial was used to begin book, chapter and verse in the Bible; different grades of script were used to distinguish between text, commentary and gloss' (p. 34)¹²⁷

.....

¹²⁶ The classification scheme in Table 6.4 owes much to a similar, unpublished exercise undertaken by a colleague, Derek Prior (now of the Community Education Development Centre, Coventry); and it formed part of a joint evaluation project with Mick Jones of the Open University Continuing Education Division, and Jane Wolfson (now of Learning Materials Design, Newport Pagnell).

¹²⁷ Ullman (1932: 117) reports that the typographic indication of the status of text was used as early as the Carolingian period (ninth century): 'One of the outstanding characteristics of the Carolingian writing, especially at Tours, was the careful distinction of different styles for different purposes ...

Ong (1958) gives a detailed and fascinating account of the career and widespread influence of Peter Ramus, the sixteenth century French scholar whose teaching method was based on the subdivision of topics into sub-topics, typically displayed in branching diagrams that encapsulate knowledge in a seductively complete form (Figure 6.12).¹²⁹ Ong is fairly dismissive of his subject, and somewhat hostile to his method. Since his comments on topic diagrams are not confined to the sixteenth century context, they are of some relevance to the present discussion – although at times hard to fathom and apparently containing the seeds of their own refutation.

For Ong, visualization is at the heart of science and education:

‘We are today more than ever witnesses of attempts to reduce everything supplied by the other senses – sounds, smells, tastes, pressures – to charts and tables which can be visually assimilated’ (p. 108)

This would seem to be an advantage, but Ong argues that it is deceptive. The essence of his objection to diagramming is that there is no spatial or visual analogue for what he calls ‘enunciation’, the making of judgements, the ‘coupling of subject and predicate – and this last term conceals an auditory analogy again; *praedicatum* is the thing cried out or *said*’ (p. 110)

Most would agree that diagrams tend to present simplified and often suspiciously symmetrical arguments, and that they are rather harder to analyse and criticize than verbal language. But it is hard to see why Ong needs to generalize from Ramus’ diagrams to all literate culture, as he appears to do. Diagrams and charts rarely appear on their own but are mostly surrounded by verbal language. Furthermore, the oral culture that Ong appears to champion is characterized by most scholars, including Ong himself, as heavily reliant on mnemonic techniques – not only the place-mnemonics but rhyme, dichotomy, analogy and myth. These techniques fix knowledge in as permanent a form as the ‘pseudo-eternity of repose’ Ong attributes to print. And whatever the advantages of dialogue, it would seem to be at least as difficult to question the guardians of oral tradition – whose job is to preserve not to improve – as it is to question a printed book.¹³⁰

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129 Ramus’ charts are not altogether different from the hierarchical schemes of 1960s educational theory (Gagné 1965, Ausubel 1963) and the text structure diagrams of recent cognitive psychologists (Britton & Black 1984). Indeed, a comment of Ong’s might strike a chord with the more sceptical of educational technologists: ‘...while many of the significant reactions in intellectual history were taking place because of new scientific or philosophical insights, they were occurring more inevitably because of the demands of a practical pedagogy – even when the pedagogical necessity was given a veneer of quasi-scientific explanation’ (Ong 1958: 306)

130 Indeed, Saenger (1982: 399) comments that ‘psychologically speaking, silent reading emboldened the reader, because it placed the source of his curiosity completely under his personal control.’

Topic diagrams as writing plans

The *distinctio* stage of the scholastic method, which the diagrams discussed by Evans embody, preceded the detailed discussion of evidence, authorities and so on. Today, too, diagrams are frequently used for the initial planning of prose. Indeed, those offering advice on writing (and thinking) frequently recommend diagramming as an aid to creativity (Buzan 1974, Field 1982). And diagrammatic techniques for ‘idea-processing’ have been available on personal computers for some time, and are integrated into some word-processing programs. Idea-processors allow writers to plan, overview and reorganize documents as hierarchically arranged diagrams of headings.

Saenger (1982) describes a medieval precedent of this development, suggesting that the synthesizing task of twelfth- and thirteenth-century scholasticism led to important changes in ways writers approached their task. Where writing had previously been undertaken in a relatively linear fashion, through dictation or the use of wax tablets of limited capacity, writers found they could no longer organize their ‘exceedingly complex thoughts’ within these constraints. The introduction of cursive script¹³¹

‘meant that authors could revise and rearrange their texts while composing them. This facility aided thirteenth-century scholastic writers to prepare texts rich in cross-references which presupposed that the reader, like the author, had the ability to flip from folio to folio in order to relate arguments to their logical antecedents and to compare comments on related but disparate passages of scripture’ (Saenger 1982: 386).¹³²

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This visual planning of arguments is central to the method of production used for books like *The handbook of sailing*.¹³³ Figure 6.13, for example, shows part of an ‘editorial flow-chart’ (sometimes known as a ‘flat plan’) used to plan a similar manual, *The indoor garden book*.

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131 Clanchy (1979: 89) regards the introduction of cursive script, with its advantages of speed and legibility, as an important aspect of the ‘shift from memory to written record’, and as a major contribution of the twelfth and thirteenth centuries to the growth of literacy.

132 Clanchy (1979: 130) also remarks on the changing nature of scholarship in the thirteenth century, comparing the library regulations of Dominican monks with those of a community of Benedictines two centuries earlier. Books were no longer issued once a year for ‘mystical contemplation’ but needed to be available for rapid consultation and comparison: ‘The difference in approach towards writing of Lanfranc’s Benedictines and Humbert’s Dominicans is so fundamental that to use the same term ‘literate’ to describe them both is misleading.’ Saenger’s suggestion that the reader is expected to apply the same flexibility of approach as the writer is echoed in the recent development of ‘interactive’, ‘dynamic’ or ‘hyper-’ text (Weyer 1982; Conklin 1986). These offer readers of electronically-delivered texts the same facilities that the author had on his or her idea-processor: hierarchical nesting of sub-sections, search facilities, note-making, glossaries and so on.

133 The short account of the production method of this book is based on interviews with staff members of Dorling Kindersley Ltd, the firm also responsible for ‘packaging’ the *Handbook of sailing*. The interviews form the basis of an audio-cassette for an Open University course on communication (Waller 1987). Rogers (1986) has also recently articulated some of the methods by which book packaging operates.

CONTENTS	INTRODUCTION	1 THE DECORATIVE QUALITIES OF PLANTS	ANALYZING DECORATIVE QUALITIES	PLANT FORM	LEAF
1	5-6	7-9	10	11-12	13-14
LEAF TEXTURE	FLOWER SHAPE	FLOWER SIZE	2 PLANT DISPLAY	HOW TO DISPLAY YOUR PLANTS	CHOOSING CONTAINERS
20	21-22	23-24	25-26	27-28	29-30
USING SHAPE, COLOUR & TEXTURE IN ARRANGEMENTS	GROUPING PLANTS IN ONE CONTAINER	PLANTING A MIXED ARRANGEMENT	MAKING ARRANGEMENTS IN DIFFERENT STYLES		DECORATIVE FINISHES
36	37-38	39-40	41-42	43-44	45-46
	PLANTING HANGING BASKETS		GROWING BULBS	PLANTING BOTTLE GARDENS	PLANTING TERRARIUMS
52	53-54	55-56	57-58	59-60	61-62
BONSAI	PLANTING WINDOW BOXES		PLANT WINDOWS	3 CUT FLOWER ARRANGING	TOOLS & TECHNIQUE
68	69-70	71-72	73-74	75-76	77-78

Figure 6.13 'Editorial flow chart used to plan an illustrated book (John Brookes, *The indoor garden book*, London: Dorling Kindersley, 1986)

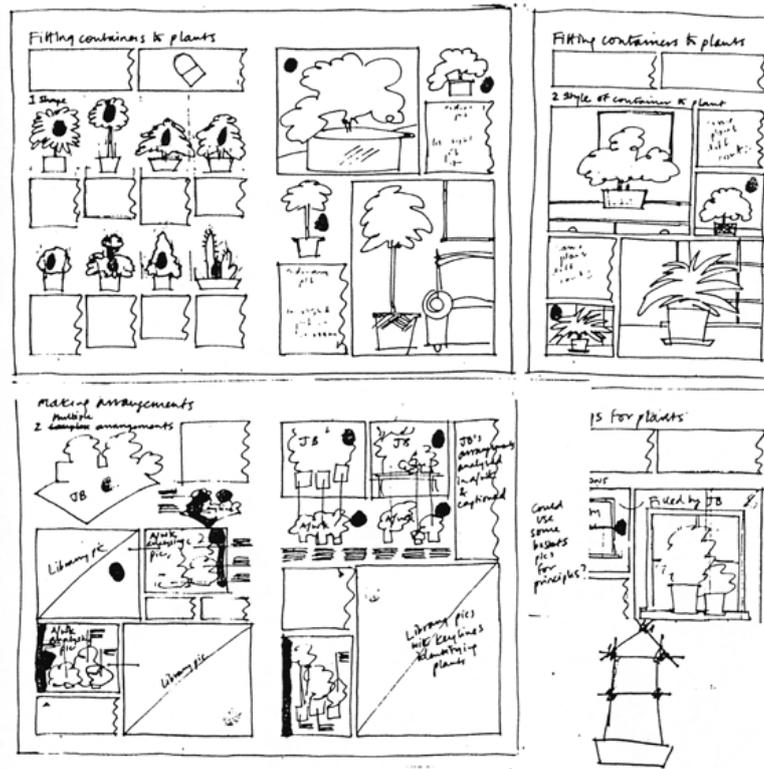


Figure 6.14 Part of a large 'design flow chart' used to plan the display of topic on pages

By planning the sequence and length of topics in advance, space is allocated more systematically than might otherwise be the case. Furthermore, as Figure 6.14 (a 'design flow-chart') shows, the design of individual pages is also planned in advance, before any of the words are written or the illustrations commissioned. The design of such pages acts as a planning chart for the organization of concepts, the writing of descriptions and the composition of illustrations.

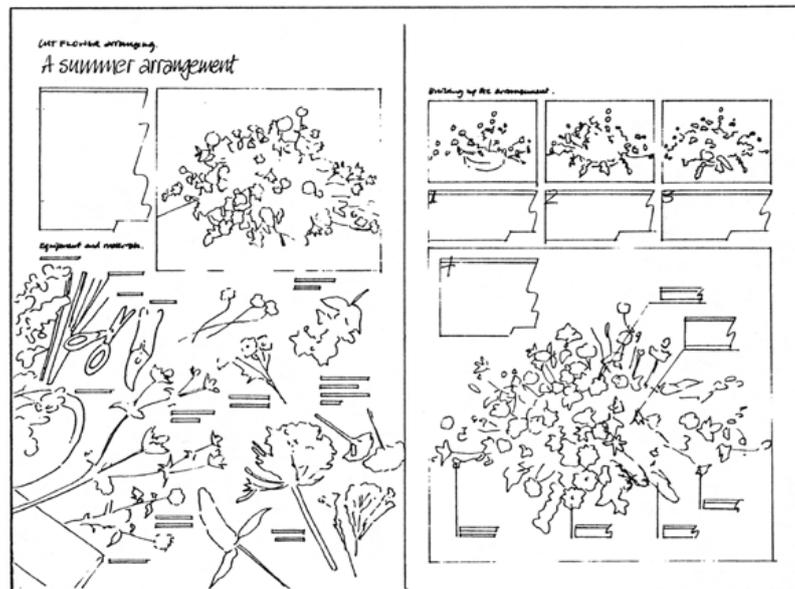


Figure 6.15 This layout has been constructed after the photo-session has helped to determine how many steps are needed to explain the procedure – in this case, a flower arrangement.

In many cases the next step in the preparation of a spread is the photo-session, where aspects of the topic are photographed. In the case of a practical task, the number of illustrations required to demonstrate it properly has a strong influence on the design of the page – the photo-session is one way of revealing the structure of a topic (Figure 6.15). Obviously, the final pages will usually undergo numerous modifications and so look considerably different from the first plan, but these books are nevertheless powerful demonstrations of the principle of text-as-diagram – typography, far from being a decorative embellishment, is as fundamental as any other aspect of the language of these pages.¹³⁴

Information Mapping

Robert Horn (1985) has attempted to systematize the use of text-as-diagram through his Information Mapping™ system of ‘structured writing’ (Figure 6.17).¹³⁵ His original vision was of a system in which

‘the physical arrangements of the maps provide a special¹³⁶ analogue to the connections and relationships of the information.’ (p. 182)

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¹³⁴ Even those aspects of graphic design that might be thought to be simple embellishment turn out to have an important function apart from their marketing value. Although the jacket design is conventionally left to last, book packagers often *start* with it. The effort to agree about the cover design enables a production team to articulate their thoughts about the genre, philosophy and general aim of the project. Agnew (1986) has recently described a similar production process in a paper entitled ‘writing backwards’.

¹³⁵ Horn preserves the term as the trade mark of his technical writing firm by insisting that it is accompanied by the ™ symbol.

¹³⁶ This is presumably a misprint or dictation error for ‘spatial’.

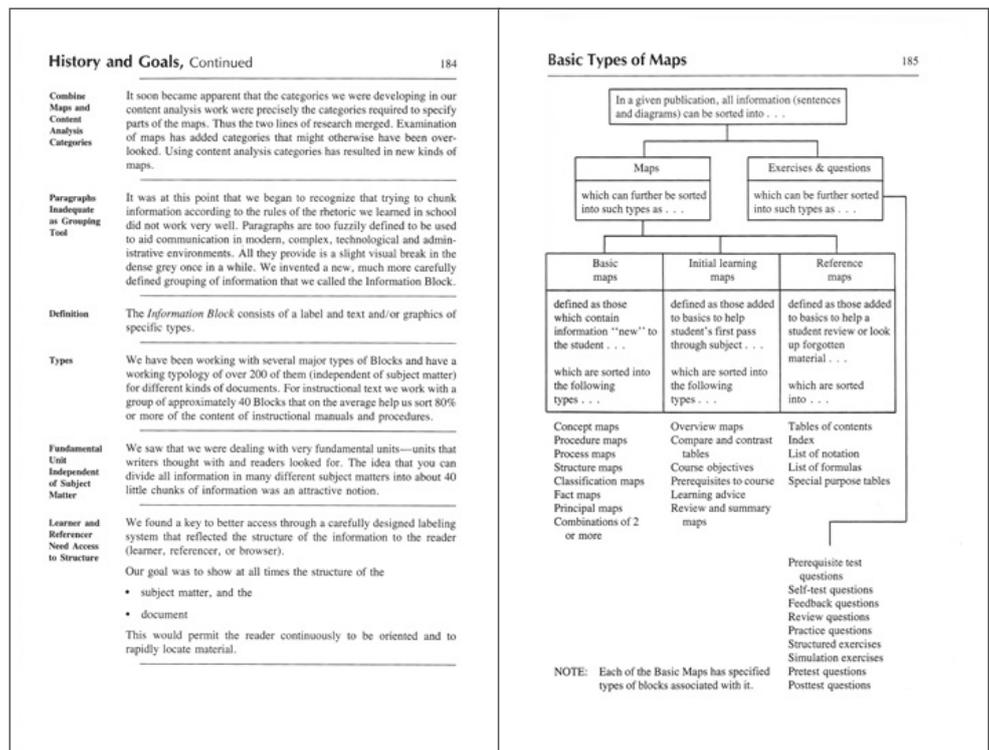


Figure 6.17 A double-page spread from an article by Horn describing his Information Mapping system (Horn 1985). Most pages, such as the left-hand page here, contain series of 'information blocks' – paragraphs with marginal headings. Diagrammatic techniques are sometimes used (right-hand page). (Original 290mm x 227mm.)

Horn claims support from a number of evaluations of the system, which requires writers to identify the status of each text component through graphic segmentation, shaping and labelling. Because it is largely directed at technical publications which are not in the public domain, its impact since it was developed in the early 1970s is hard to assess. Owing to conservatism, the high cost of the manual and the extra time taken to prepare texts using Horn's guidelines, it is probably rather limited. But although it seems to be a very good idea, there are some significant and instructive flaws in its implementation.

For one thing, the explicit labelling of every turn of the argument leads to an unnatural and unsubtle fragmentation of the text. Since every component is labelled with equal typographic emphasis, it is scarcely easier to pick out the major turning points than if nothing had been labelled. This is a classic problem of categorization: to classify each item under a different label is as unhelpful as to classify them all under one heading.

Secondly, Horn labels each kind of block in the same way: definitions, examples, summaries and facts are displayed in the same typographic voice. His problem, again, is over-systematization: since he claims 'a working typology of over 200 [types of block] (independent of subject matter) for different kinds of document', it would not be possible to distinguish between them all.

Thirdly, although it represents the injection of graphic techniques into verbal language, the system pays insufficient attention to graphic subtleties. As Figure 6.17 illustrates, the use of space, emphasis, rules, and diagramming is often clumsy. In this example, we might identify the excessive capitalization of headings that makes them hard to scan,¹³⁷ the equal treatment given to new headings and continuation headings (this gives inadequate emphasis to the change of topic), and the poor diagramming on the right hand page.

Though contact with typographers is leading to improvements, the disappointing graphic execution of published examples of Horn's structured writing highlights the uncompromising nature of visual imagery.¹³⁸ It also reinforces a conclusion reached in Chapter 3: that the exact graphic configuration and rendering of graphic elements is as important – as constitutive to their meaning – as their mere presence or absence. The lack of attention to the graphic implementation of Information Mapping may, of course, be a deliberate compromise. Given that the method is designed to be applied by technical writers with few graphic skills and a variety of reprographic techniques, it is probably wise to keep the rules simple. The constraints imposed by the technology of writing and printing are the subject of the next chapter.

This chapter has reviewed some aspects of the use of typography for displaying the structure of a text's topic. Typography and diagramming were seen as literal instances of visual metaphors used in the context of rhetoric (Nash 1980) and semantics (Lyons 1977). The next chapter will review the next of the three basic structures posited by the genre model – artefact structure.

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137 Other examples of information mapping do not capitalize headings in this way, so this is probably the result of intervention by the publisher of the book in which this chapter appeared. Nevertheless, the Information Mapping manual remains silent on this question.

138 As a result of presenting his work at conferences that included typographers, Horn is aware of the graphic deficiencies of his system. The Department of Typography & Graphic Communication at Reading University has produced more elegant typographic solutions to the problems of Information Mapping.

7

Artefact structure

This chapter examines some influences of the technicalities of text production on what may be expressed. First I shall discuss problems associated with the segmentation of language – how artefactual units such as the line and page influence the display of semantic or linguistic segments. I shall go on to consider some broader influences of communication technology on what is or may be expressed.

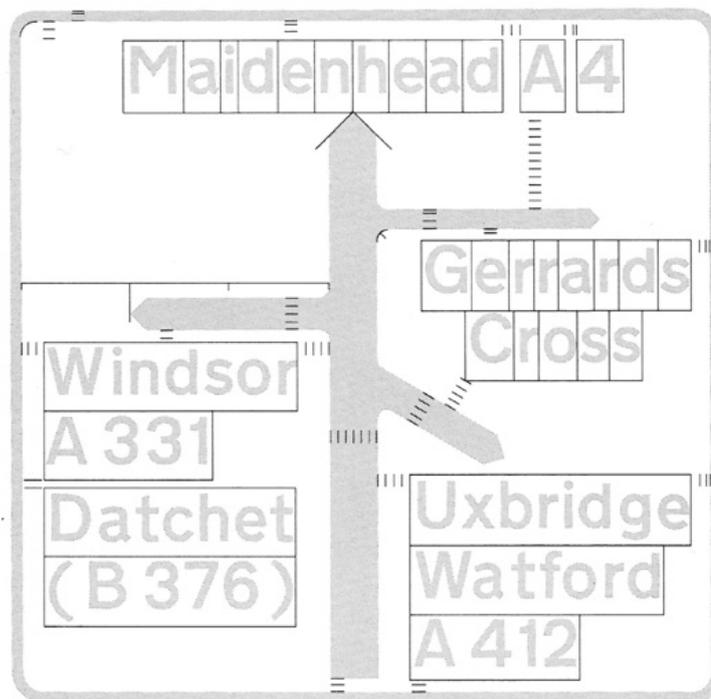


Figure 7.1 Diagram from Kinneir (1984: 348) explaining the layout system for British road signs.

In certain special circumstances, there is no predetermined limit to the size of the page or frame. In British traffic signs, for example, the size is determined by the content. Kinneir (1984: 347), the designer of the system, describes how ‘with the layouts there was a fundamental difference of approach from the usual typographic practice’. British road signs are laid out as a diagram of the road ahead as viewed by the driver. Text is placed at a minimum distance from lines representing roads, and only when the layout is completed is the outside frame determined – again, by a minimum distance. Figure 7.1 illustrates the principle. In book illustration, the

opposite is sometimes the case, since illustrations can, within reason, be reduced or enlarged to fit a given area. But where both the page size and the image size are inflexible, the artefact makes itself known.

Levels of graphic segmentation

A child learning to read must come to realize that while some breaks in the string of letters to be deciphered are meaningful, others are almost completely arbitrary. Spaces between letters indicate a word break, and in some early reading materials a new line indicates a new sentence, and a new page announces a new topic. But not always, of course. At some point we learn that some, and eventually most, line breaks have no meaning – we have simply come to the edge of the column.

Writing in columns originally developed, not because of the effect of page size, since papyrus rolls offered an unlimited page width, but for other functional reasons. According to Thompson (1912), column widths varied greatly among Greek papyrus rolls. Apart from considerations of legibility, the maximum column width was presumably dictated by the amount of the writing surface to view as the papyrus was unrolled with one hand and rolled up with the other. However, legibility does seem to have been a factor quite early on, since columns ‘were generally narrow in texts written for the market by skilled scribes’ (p. 46). Moreover, after the development of the codex, when the page width might otherwise have dictated the column width, ‘continuing the practice observed in the papyrus rolls, the arrangement in [two, three or four] columns was usual’ (p. 55). This is confirmed by Turner’s (1977) extensive survey of early codices.

According to Thompson, even though word separation was rare in Greek and Roman manuscripts, line breaks were made much as they are today – between words where possible, and otherwise between syllables (although the hyphen was not introduced until the eleventh century).¹³⁹ O’Hara (1971: 113) supports this view, but suggests that ‘with the implementation of printing, both the rigorous employment of the hyphen where it was called for and the “correct” division of words into syllables in turnovers fell into disuse’, a fact he ascribes to commercial pressures.

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In recent years a number of people have suggested reforms to the convention by which we end lines according to what Twyman (1979)

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¹³⁹ Saenger (1982: 371) notes contemporary evidence that ‘Caesar Augustus, in his autograph letter, had the peculiar habit of connecting with a long loop the last syllable of one line to the first syllable of the next line when the two syllables formed part of the same word, a practice illustrating the idiosyncratic attempt of one author to overcome difficulties facing all Romans when writing in a script lacking word division’. This use of lines to connect the end of one textual unit to the beginning of the next is also manifested in some recent government forms where respondents must follow different routes depending on their response to an earlier question. The alternative paths are indicated by lines, reminiscent of those painted on hospital floors to help people navigate complex routes.

calls quasi-semantic rules ('with the lines broken only between words or within words according to etymology'). Twyman distinguishes 'quasi-semantic' from 'semantic', 'partially semantic' and 'mechanical' word breaks. Semantic word breaks are common in the case of unjustified type (with a ragged right-hand edge). Partially semantic breaks are those 'with the lines broken between words or within words either phonetically or arbitrarily'. In mechanical word breaks lines are broken at the most convenient point regardless of meaning. There might be a case for merging the quasi- and partially semantic categories, since in practice the choice of etymological or phonetic grounds for breaking words is not always consistent and is largely a matter of taste.

In the discussion that follows I shall use the term 'arbitrary' to mean any break in lines, columns or pages that is prompted solely by the edge of the type area. Since the word-break system employed is not generally varied within a particular document, it does not form part of the system of contrasts through which writers can create meanings,¹⁴⁰ and so can be bracketed with other global stylistic choices such as the page size.

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De Vinne (1901) considered the hyphenation of words at line-endings to be a waste of time and a needless source of difficulty to the printer, who cannot reasonably be expected to have the expertise to make etymologically correct word-breaks. While modern typographers would solve the problem by abandoning the justification (alignment) of the right hand edge of the column, this is rejected by De Vinne, who prefers the more radical method of arbitrary word breaks, inserted wherever the line-ending happens to fall. He is able to cite a precedent in the work of the eminent eighteenth century printer John Baskerville, in whose edition of *Paradise Lost* he found such unorthodox word-breaks as 'e–specially' and 'o–therwise'. Figure 7.2 illustrates a modern example of truly arbitrary word-breaks.

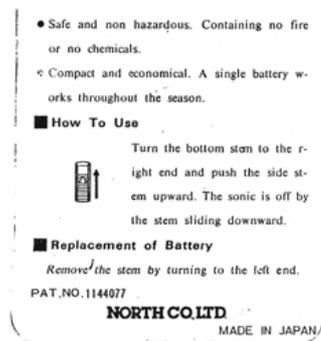


Figure 7.2 Instructions to a gadget bought by a friend in Singapore

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140 A relatively minor exception to this is where unjustified type, which some typographers prefer without word-breaks, is used as part of a stylistic distinction between text components. However such a distinction would normally involve additional variations in typeface and size, since justification is not a prominent enough cue on its own.

However, De Vinne does not employ such a system himself, regarding it as an ‘ideal’ rather than a recommended practice. He explains that

‘It is not probable that this innovation will find favor with the critical, but it may be mentioned as an exhibit of increasing restiveness at grammatical and typographical shackles which annoy the reader and do not help and do hinder the proper rendering of printed words.’ (De Vinne, 1901: 143)

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He goes on to argue that, just as readers have learned to do without catch-words to help them over page breaks, they can equally easily learn to deal with arbitrary hyphenation.

Most other would-be-reformers have gone the other way and suggested that line endings should be made more meaningful not less. That is, that they should mark significant breaks between linguistic or semantic units. While this is a normal and uncontroversial practice commonly recommended when breaking display headings and titles (Dowding 1966), a number of experimental studies have tested the application of this and even more radical related principles to continuous prose.¹⁴¹

Andrews (1949) proposed what he termed ‘square span’ typography, in which phrases were grouped in small stacks, but his experimental results were inconclusive:

Andrews (1949) proposed	what he termed ‘square span’ typography	in which phrases were grouped in small stacks.
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North & Jenkins (1951) moderated the proposal by suggesting that it was the spacing of phrases, not the stacking, that was important. They reported small increases in both speed and comprehension with their ‘spaced typography’:

In spaced typography, extra space is added between ‘thought units’.

However, although a number of others have investigated these options, most fail to prove their advantages or admit that the evidence to support them, if any, is very slim (for example, Klare, Nichols & Shuford 1957; Coleman & Kim 1961; Carver 1970; Wendt 1979). The principles for dividing lines into phrases or clauses are mostly intuitive, although Klare *et al* articulated some rules followed in their study. All of the studies illustrate just ‘one line’ of the square span format, and it is not clear how multiple lines would be spaced.

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Semantic or syntactic line breaks offer rather more hope of acceptance by readers, since they do not look startlingly unusual. Coleman & Kim

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¹⁴¹ Perhaps I should just say ‘prose’ since the suggestion under consideration is, in effect, ‘discontinuous prose’.

(1961), inspired by children's books which employed this system,¹⁴² did not obtain a significant result from their pilot study, but others seem to have been sufficiently encouraged to pursue the idea. Frase & Schwartz (1979) reported an impressively faster (14–18%) response time for a task which required subjects to verify the answer to a question from the experimental text; this represents a typical use of a technical manual but does not resemble the reading of ordinary prose where fluency is rather more important. In fact Raban (1982), who studied the effect of such line-endings on children's reading, found that syntactic breaks were mistaken for the ends of sentences. It also seems strange to suggest that a particular punctuation technique (for that is what line-breaks would become) should be distributed evenly throughout a text, and thus be determined by line length as well as sense.¹⁴³ Hartley (1980) criticized Frase & Schwartz's methodology and failed to replicate their findings under different conditions.

Figure 7.3 shows a rare instance of the system in use. Gerstner (1974) uses it as a component of his 'integral typography', some aspects of which he defines on the pages illustrated (p. 136-137).

Each reader can decide for himself or herself whether their own reaction corresponds to my own: that the poem-like quality of the system draws attention to Gerstner's language and, paradoxically, away from his sense. Poets, of course, have long been aware of the typographic dimensions to language, which include the shape of stanzas (even to the extent of Herbert's shaped poems) and visual rhymes as well as line breaks.

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¹⁴² The books in question were published in the 1940s by Lillian Lieber. Burt (1959) also recommends this practice but does not cite any precedents or research evidence.

¹⁴³ There is an eighteenth-century precedent for this suggestion. Robertson (1785: 75) cites Walker's *Elements of Elocution* thus: 'An ingenious writer has observed, that not half the pauses are found in printing, which are heard in the pronunciation of a good reader or speaker; and that, if we would read or speak well, we must pause, upon an average, at every fifth or sixth word'.

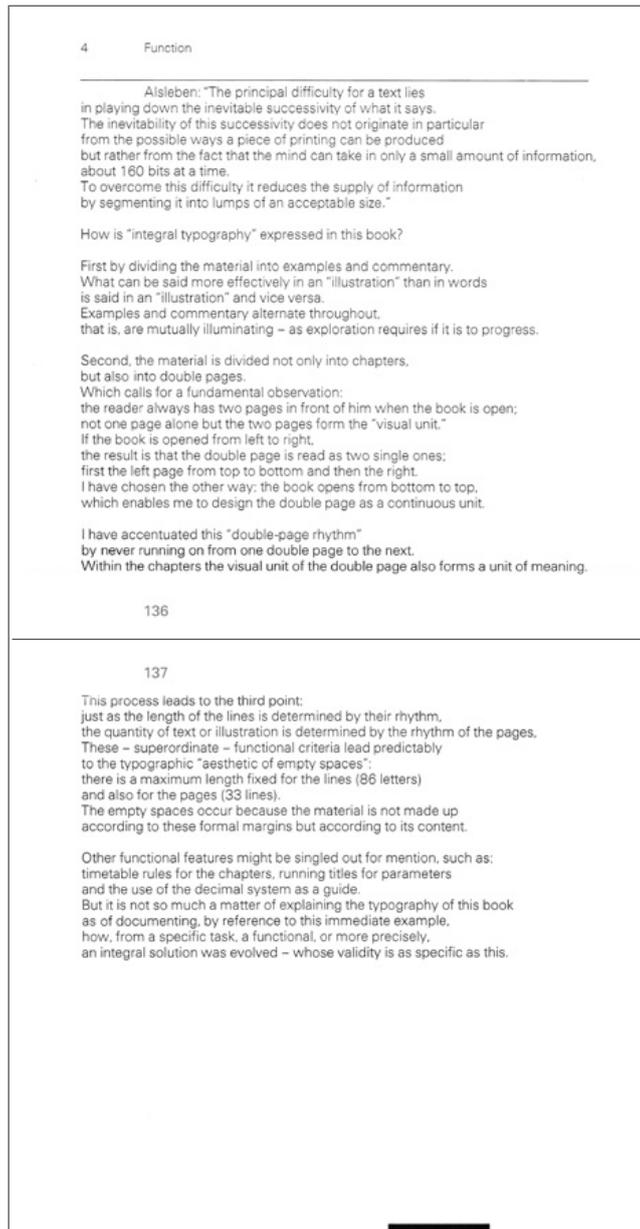


Figure 7.3 Gerstner's 'integral typography' includes semantic line breaks

Crystal (1979) also reviews the idea of semantic line breaks and discusses the issue of line endings in the context of his fourteen levels of graphological organization in text (described in Chapter 1, Table 1.13). He correlates each level of graphological organization with other linguistic levels of analysis – phonology, grammar and semantics. Below the level of the line various correlations with phonology are identified, as well as two with grammar, and two with semantics. Above the line all correlations are with 'a storable information structure in semantics', while the line itself is the only level at which Crystal finds no correlations (with the single phonological exception of metrical lines in poetry). His analysis effectively concludes that, in continuous prose at least, graphological units below the line level can be considered invariant aspects of the writing system and

therefore not really questionable for practical purposes. At and above the line level, though, there is more room for debate, particularly since the line emerges from this analysis as the only graphological unit with no linguistic or semantic status.

This is a surprising conclusion for two reasons. Firstly, it seems to ignore instances where lines do have an independent semantic status – such as in lists or examples of block language (signs, headings etc). Secondly, if line breaks can be arbitrarily determined by the printing process, so can page breaks, which in this analysis are accorded semantic status. But in conventional printed prose, line breaks are actually determined with a *greater* measure of semantic consideration than page breaks. Lines can only be ended at word or syllable breaks, whereas it is rarer for page breaks to be manipulated for equivalent reasons (to prevent a widow, for example).

The problem highlighted here is that line-breaks, page-breaks and, in the case of multi-column layouts, column-breaks can be *either* arbitrary or meaningful. Table 7.1 suggests some of the semantic implications of meaningful breaks.¹⁴⁴

	Arbitrary	Meaningful	
		Single break	Successive breaks
Line	Prose	New paragraph	List Verse
Column	Prose	New topic	Table Parallel text
Page	Prose	New topic New chapter	Topic frame

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Table 7.1 Some semantic implications of meaningful breaks in the language string.

At the *line* level, an arbitrary break is clearly just one of the conventions of the writing system that we take in our stride. Line breaks within paragraphs are generally not specified by authors, although they may object to awkward word breaks when they read their proofs. If a new sentence starts on an unforced new line, though, we regard it as the beginning of a new paragraph. If a succession of sentences, words or phrases begin on new lines we are likely to regard them as forming a list.

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¹⁴⁴ Harris' terms, 'structurally superimposed' and 'structurally necessary' (Harris 1986: 137), might be substituted for 'arbitrary' and 'meaningful'.

Burton, D. (1980), 'Dialogue and Discourse: a sociolinguistic approach to modern drama dialogue and naturally-occurring conversation', London, Routledge & Kegan Paul.
 Condon, W.S. and Ogston, W.D. (1966), Soundfilm analysis of normal and pathological behaviour patterns, 'Journal of Nervous and Mental Disorders', 143, 338-47.
 Condon, W.S. and Ogston, W.D. (1967), A segmentation of behaviour, 'Journal of Psychiatric Research', 5, 221-35.
 Coulthard, R.M. (1977), 'An Introduction to Discourse Analysis', London, Longman.
 Coulthard, R.M. and Brazil, D.C. (1976), Aspects of discourse structure: a progress report, unpublished MS., University of Nancy.
 Coulthard, R.M. and Brazil, D.C. (1979), 'Exchange Structure', Discourse Analysis Monographs, no. 5, University of Birmingham, English Language Research.
 Coulthard, R.M. and Montgomery, M. (1976), KAAU ESP research project: the structure of lectures, final report, mimeo, University of Birmingham.
 Ekman, P. and Friesen, W.V. (1972), Hand movements, 'Journal of Communication', 22, 353-74.

Figure 7.4 This bibliography is undercoded: meaningful and arbitrary line breaks are hard to distinguish. Source: Coulthard & Montgomery (1981).

In practice, meaningful line, column or page breaks are often given extra coding to prevent ambiguity. Ambiguity is particularly acute when arbitrary line-breaks occur in a list – where line endings would normally be seen as significant (Figure 7.4). In such cases a second coding – numbers, bullets, space between items, or indented turnovers – is normally added to clarify the structure.

Paragraph breaks are almost always given a double coding – new line plus indentation, or new line plus blank line – in view of the frequency with which sentence-breaks within paragraphs happen to coincide with line-breaks. Figure 7.5 shows an example.

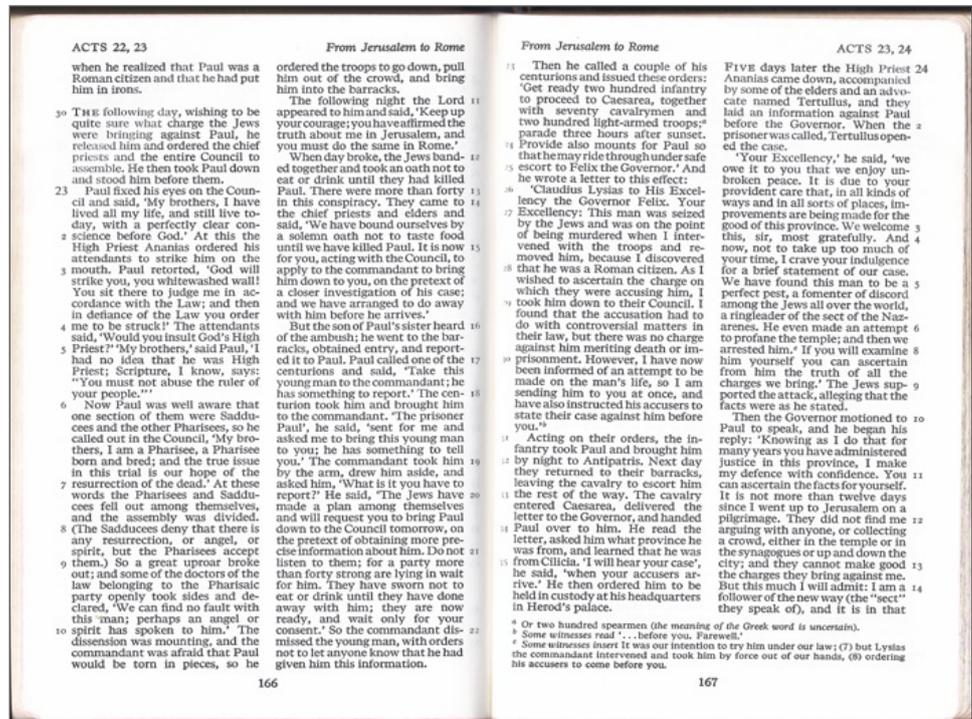


Figure 7.5 As can be seen on the left hand page, a line space is used here to indicate a major break in the text (after Chapter 22, verse 29). However, small capitals are also used for the first word of the new section, in case the line break coincides with a column break. This happens on the right-hand page at the start of Chapter 24 (modern versions of the Bible follow the breaks in original sources, not the later, inappropriate chapter divisions). Source: *New English Bible*. Dimensions: 116mm x 176mm.

An arbitrary break at the foot of a *column* is also a convention of continuous prose, while a column break not forced by the foot of the type area would generally imply the beginning of a new topic (usually additionally signalled by a heading). A succession of column breaks (particularly when reinforced by some connection among the column headings) may imply a parallel structure. When each parallel column is broken into parallel lists, a table may result.

At the *page* level, an unforced break (again usually reinforced by a heading) signals a new topic – in practice, a new chapter, section or article. Successive meaningful page breaks, though, form double-page spreads and so define a complete ‘topic frame’ which bounds the discussion of a single topic. It is notable that publications using many graphic effects frequently opt for the treatment of pages as topic frames – not only popular handbooks such as the *Handbook of sailing* but also technical manuals. For example, Smillie (1985) describes the use of the page as topic frame in US Army documentation.

Unlike columns, which can vary in height and width as their content dictates, pages are invariable in size. There is therefore a trade-off between this inflexibility and the ability of page-organized texts to use two-dimensional diagram-like graphic effects to indicate topic structures. One point we may make in defence of the practice of writing and designing by spreads is that continuous prose is virtually the only format for discourse that does not place limits on its length. Spoken addresses, such as speeches, lectures and sermons, are ultimately bounded by the conventions of the occasion or the attention span of the audience.¹⁴⁵ The fixed time of the school lesson is perhaps the most direct parallel to the treatment of a page or double-page spread as a topic frame.¹⁴⁶ In the educational context, Duchastel (1982) has suggested larger page sizes for textbooks to enable them to make better use of graphic techniques – fold-out posters that he terms ‘unbounded text’.

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¹⁴⁵ According to Hunt (1970), the division of the Bible into chapters was determined largely by the length required for a church lesson. As Figure 7.4 shows, the sense points identified by modern translators do not always coincide with Authorized Version chapter divisions.

¹⁴⁶ Saenger (1982) suggests that instances of medieval sermon texts organized as double spreads may have resulted from the practice of transcribing sermons on to wax tablets, which effectively limit the writer to a double spread. Margaret Smith (personal communication, University of Reading, January 1987) tells me that she has found several fifteenth century texts organized in pages, and mentions Sebastian Brant’s *Ship of fools* in this connection.

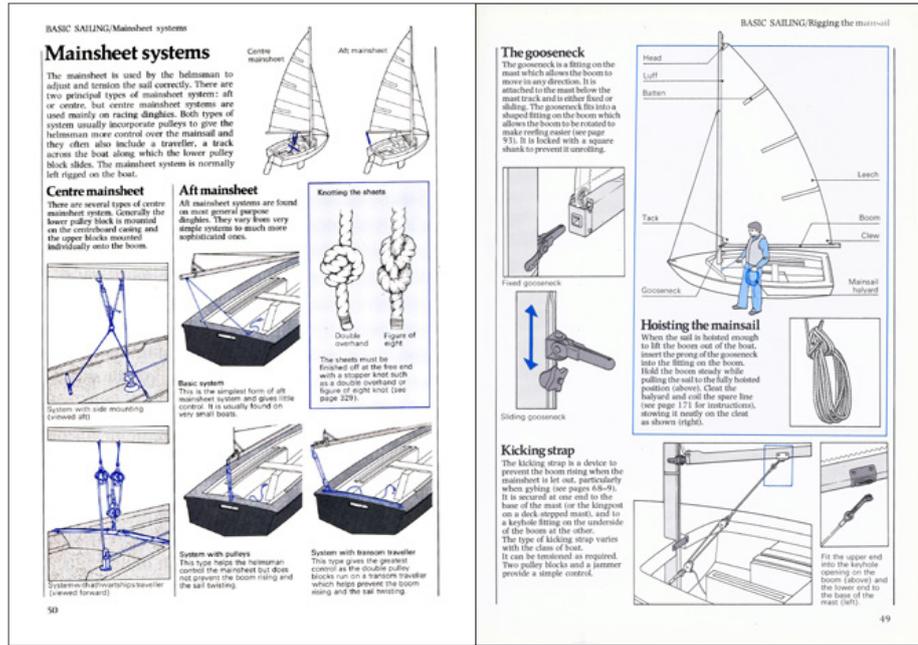


Figure 7.6

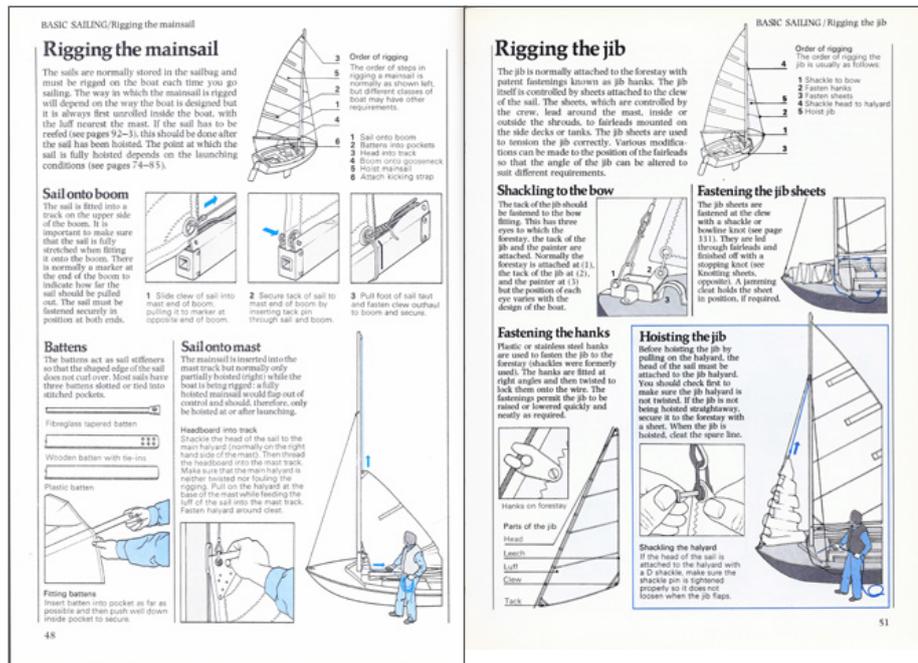


Figure 7.7

The Procrustean page

The relative inflexibility of the page as topic frame can be seen in a sequence of double page spreads from *The handbook of sailing* (Figure 7.6 and 7.7). It is slightly curious that the section entitled ‘Rigging the mainsail’ should precede the explanation of ‘Mainsheet systems’. Although most sailors would agree that it is extremely impracticable to fit the mainsheet

after the sail is hoisted, the instructions on rigging and hoisting the mainsail make no mention of the mainsheet, which is mysteriously blanked out in the 'Hoisting the mainsail' diagram (top right of Figure 7.6). However, if the single page allocated to 'Mainsheet systems' were to precede 'Rigging the mainsail', as would seem sensible, the latter two pages would no longer form a single spread of facing pages. What appears to have happened is that the (artefactual) need to fit each topic into a single or double-page display has influenced the order of presentation. The sequence of topics no longer reflects the 'fact structure' of the task but the technicalities of the medium. While it illustrates the principle quite well, this example is perhaps somewhat marginal – the reader is presumably expected to read both sections (and more besides) before attempting to launch a boat. And the writer could easily have included at least a mention of the mainsheet in the rigging instructions. However, the overall impression of this book, and others written in the same style, is that the argument has to be continually stretched or condensed in order that it should fit into the Procrustean bed of the page.

Figure 7.8 is from another home reference manual in which the page has been subdivided into four smaller frames for three sub-topics. The subdivision is shown through the use of prominent headings and also by establishing a strong visual gestalt for each sub-topic with (in the absence of horizontal rules) clear channels of white space. Notice, though, that the white space is only as clearly defined as it is because the prose in each section divides evenly into three columns. Since this is achieved not just four times on one page, but throughout the book, it is clearly no accident. Moreover, the topic fits exactly into the page, and the space between topics is identical throughout the book. It is obvious, then, that each section, subsection and even each caption in this book has been 'written to length' and that a process of what has become known as 'cutting and filling' (Rogers 1986)¹⁴⁷ has taken place as the text has been typeset and made up into pages.

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¹⁴⁷ According to Moran (1978: 4), this was once known, rather more imaginatively, as 'soleing and heeling'



Figure 7.8 From The Reader's Digest book of do-it-yourself skills and techniques, (1977). 189mm x 265mm.

De Vinne (1901) sees nothing wrong with requiring authors to adapt to the constraints of the printing process, quoting Benjamin Drew (no date given):

‘Theories are elastic, – are expandable and compressible; but types of metal have set dimensions of extension and in some circumstances will refuse to budge... Types are tyrannical, and will sometimes perpetrate solecisms under the plea of necessity’ (*Pens & Types*, p. 89)

Against that we may quote Henry Fielding, who is clearly against the adjustments that must have been necessary in the Reader's Digest example we have just considered. He once likened newspapers ‘which consist of just the same number of words, whether there be any news in them or not’ to a stage coach ‘which performs constantly the same course empty as well as full’ (*Tom Jones*, Book II, chapter 1).

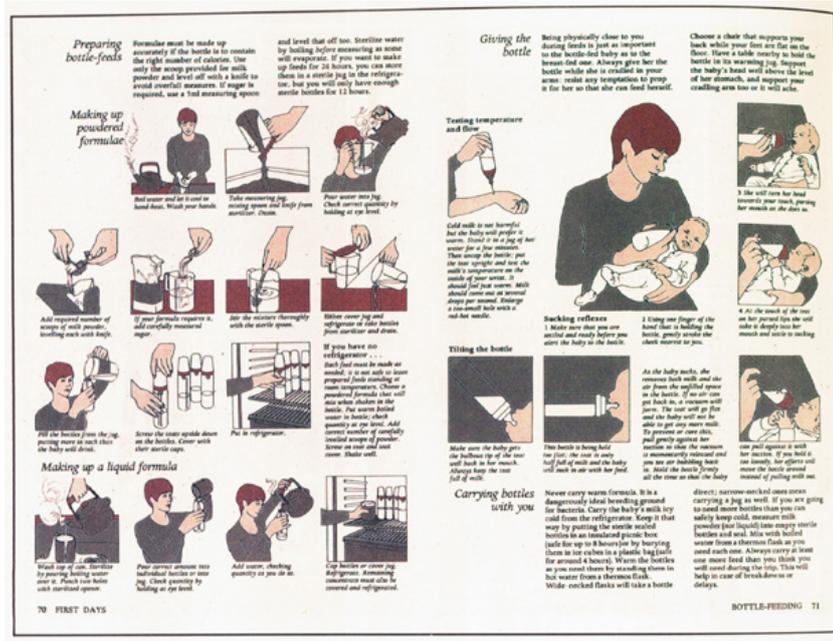


Figure 7.9 Spread from *Baby and child* by Penny Leach (1977, London: Michael Joseph)



Figure 7.10 Version of the above published in 1980 by Shogakukan, Tokyo

We can see the Procrustean effect particularly clearly in Figures 7.9 and 7.10, which represent the equivalent double-page spreads from the English and Japanese editions of the same book. The problem here is that the same content is to be fitted into approximately the same size of page, but using not only a different language but a different writing system. Besides the obvious differences in script and reading direction, the relative economy of the English writing system means that it effectively has the advantage of a larger page format. As a result we can see that the Japanese translator has had to cut a proportion of the material in order to fit the topic into its frame: five illustrations have had to be omitted. It is worth noting, though,

that the ability of the Japanese to write from top to bottom as well as right to left gives them an additional technique not available to the designers of the English version.¹⁴⁸ It is very effectively used on the right hand page to enhance the bracketing effect of the introductory section, and, on the left hand page, to recover lost space by running around the central illustration.

We may also note that the designer of the Japanese version, by using rules and boxes, has been more successful in structuring the material, particularly on the right-hand page. This could be because the variable direction of the writing system discourages the assumption that readers will always move reliably from left to right without the cuing offered by the horizontal rules; or because the Japanese writing system, unlike the English one, has not been discouraged from using boxes and rules by five centuries of a printing process in which vertical rules, especially, were difficult to handle; or perhaps the smaller format places the alternative structuring technique, white space, at a premium.

Grid systems

Most of the examples considered so far in this chapter are instances of grid typography, introduced in Chapter 1. By subdividing the page, grids increase the range of possible topic frames. Instead of just one or two frame sizes (that is, a single or double page spread), a topic may take any combination of grid squares as its frame while retaining the standard widths that have traditionally been required for typesetting and picture processing.

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¹⁴⁸ Encouraged in part by evidence that Chinese readers read vertically slightly faster than horizontally (Tu 1930, cited by Tinker 1955), some have suggested a similar ‘vertical typography’ system for readers of English, in which one word appears on each line. Tinker (1955) reported that the vertical arrangement slowed readers down, but that they improved with practice. Coleman & Kim (1961) obtained promising results with vertical arrangements which Coleman & Hahn (1966) were unable to replicate. A Japanese acquaintance tells me that the vertical arrangement is more normal and is preferred, but that the horizontal system was introduced in order to be able to incorporate Roman script for western names, numerals, and certain scientific terms. This also explains the apparent anomaly that, although the page sequence in Japanese books is the reverse of the European convention (they start at what to us is the back of the book), the individual columns are read from left to right.

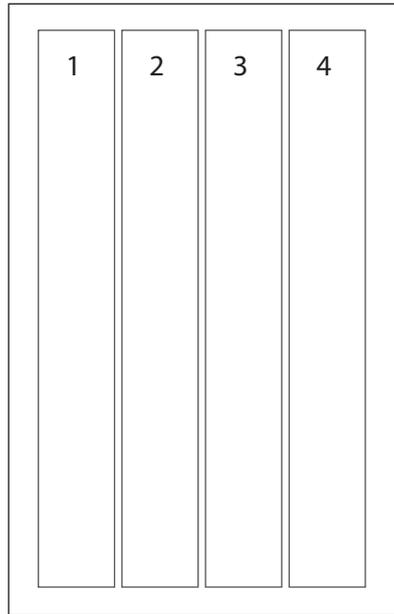


Figure 7.11 Columnar grid

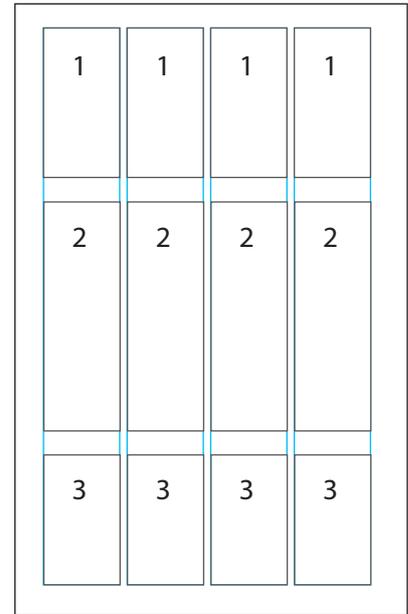


Figure 7.12 Parallel columnar grid

We can distinguish several different kinds of multi-column arrangement. Simple multi-column grids, in which text flows from one column to another as if they were pages, can be termed *columnar* grids (Figure 7.11). The telephone directory is an example of a simple columnar grid. In *parallel columnar* grids (Figure 7.12) the text still flows vertically down the page, but the content of the parallel columns is related horizontally. One column may contain headings or marginal notes related to contents of the other column.¹⁴⁹ Figure 1.4 showed an example in which the parallel columns represent the same text in three languages.

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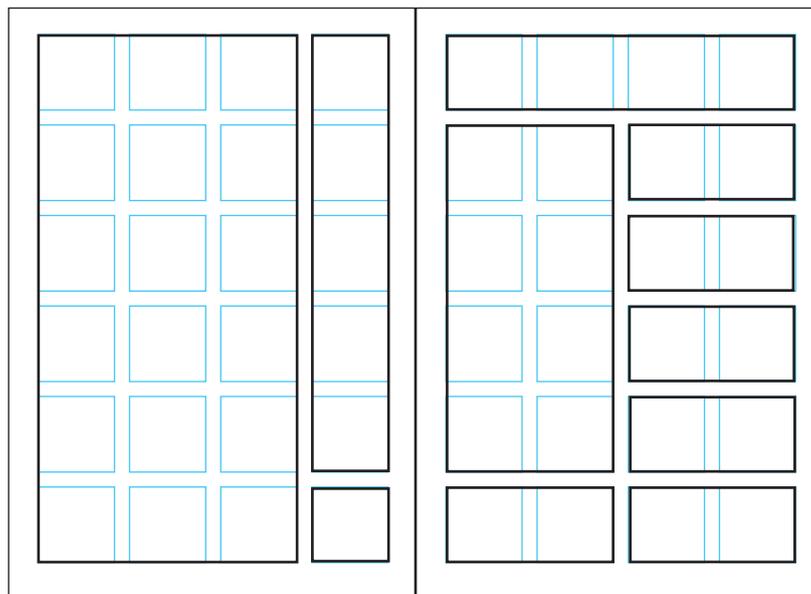


Figure 7.13 Modular grid

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149 Duchastel (1985) discusses marginalia in some detail.

The classic Swiss grids, based on regular rows as well as columns, are *modular* (Figure 7.13). Topic frames may be constructed from any (usually rectangular) combination of modules. Truly modular texts are rarely found – whereas typography textbooks (for example, Rüegg & Fröhlich 1972) usually illustrate strictly modular grids, their practical examples rarely make use of the standardized horizontal alignment points. Most implementations of the grid system use what might be termed *blocked* grids, which are similarly composed of rectangular frames, but only their width, not their height, is determined by the grid. The *Handbook of sailing* uses a blocked grid in which the designer can use a two, three or four column arrangement in any given horizontal strip of the page.

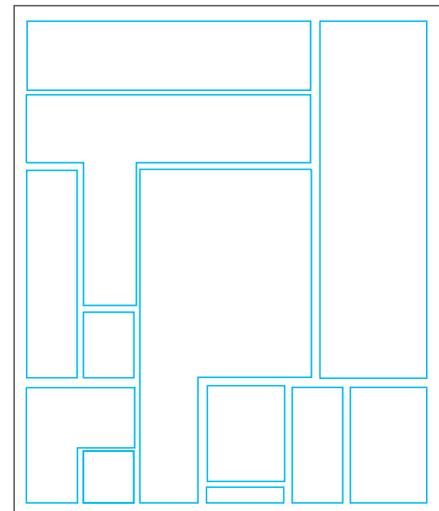


Figure 7.14 Irregular grid

Irregular grids are built up from standard column widths but topic frames are not always rectangular. Most tabloid newspapers use irregular grids¹⁵⁰ in which editorial and advertising items are interwoven to create an impression of variety and compete for the attention of the browsing reader (Figure 7.14). Their purpose is the very opposite of the cool impression of order found in Swiss typography – to prevent, not to create, clear visual gestalts. The disordered but compact pages of tabloids appear to give value for money – since the reader can never take the page in at one glance, there might always be something that has been missed.

De Hamel (1984) has provided a detailed and fascinating account of the page layouts used for the production of twelfth-century glossed Bibles, in which the parallel texts of scripture and commentary must be laid out side by side.¹⁵¹ The problem was that the proportion of scripture to commentary varied throughout the text. In the first half of the century,

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¹⁵⁰ Hutt (1967) and Evans (1973) discuss newspaper design in detail.

¹⁵¹ A recent review by Gibson (1986) is somewhat sceptical of de Hamel's claims.

parallel columnar grids were used. The vertical columns were pricked through an entire quire, although sometimes adjusted in width according to the proportion of gloss to scripture on a particular page. The scripture, in large script, would occupy the central column, while the glosses would be placed at appropriate points in the margins, sometimes forming L-shapes by extending into the head or foot margins (Figure 7.15).¹⁵² The introduction of greatly expanded glosses, though, placed too much strain on this system, and were eventually produced as continuous texts with the scripture omitted – an arrangement which suited the more learned scholars, who would have memorized much of the relevant scriptures, but which did not suit some of the wealthier purchasers of glossed Bibles (Figure 7.16).

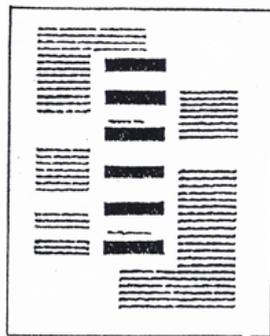


Figure 7.15



Figure 7.16

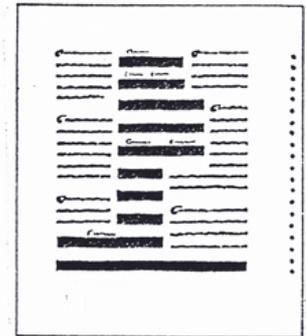


Figure 7.17

According to de Hamel, the problem was solved by the development of what was, in effect, a modular grid system, in which all columns shared the same horizontal alignments. The scripture column, still in larger script, used only alternate lines of the grid; and since its width could vary according to the proportion of related gloss, the individual glosses were irregular in shape (Figure 7.17). The modular system thus allowed scripture and gloss to be interleaved in a complex but easily executed way. De Hamel argues that the layout's modularity (although he does not use this term) also made it easier to understand since each gloss could be aligned correctly and reliably with the relevant passage of scripture.

The logic of assembly

Modular grid systems exploit what, adapting Gombrich's 'geometry of assembly' (1979: 9), we might call the logic of assembly. Gombrich's argument is rather different to the present one and he does not develop the term very far. Discussing decorative art, he is simply concerned to point

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¹⁵² The layout of de Hamel's own book illustrates the principle quite well. He uses a parallel grid in which footnotes, smaller illustration and references to plates appear in the margin opposite their point of reference in the text. However, occasionally a marginal item gets pushed onto the next page through lack of space. Unfortunately modern production techniques are less flexible than those of the scribes, and he is unable to vary the layout page by page to suit its content.

out that simple and predictable visual patterns are easily understood but monotonous. The pattern made by four or five flagstones explains a whole pavement and we need look no further:

‘When the expected happens in our field of vision we cease to attend and the arrangement sinks below the threshold of our awareness.’

The term implies that methods of assembly impose their own visual logic on the things assembled, whether they are corn cobs, sea urchins or pavements (Gombrich’s examples) or books. As readers, we understand that many features of typographic pages are artefactual, not linguistic – line breaks and page breaks are virtually ignored by fluent readers and not mistaken for linguistic signals. At the end of a line or page we turn automatically to the next. A consistently applied grid system might be similarly internalized by readers, and complex texts read with greater fluency and confidence. Whereas the tabloid newspaper (Figure 7.14) deliberately never allows us a sense of completion, the Reader’s Digest manual (Figure 7.8) conveys its own structure at a glance.

Grids are used as an analogy by Harris (1986) to describe the relationship of the alphabet to phonemes, likening the letters of the alphabet to map reference grids imposed on speech. His purpose is to explain why alphabetic writing is not purely phonetic, not an exact point for point transcription of every contour of the landscape of speech. Harris’ analogy adapts well to the present context.

Although Harris enjoins us not to make the basic mistake of taking the grid lines on a map to represent streets, that is exactly the assumption readers may be expected to make about typographic grids and pages when they are used to delineate topic boundaries. As Figure 7.8 demonstrated, it is not hard to find pages where the writer has ‘written to length’ – prepared each section or paragraph to match the visual slot made available by the grid. (Presumably the problem facing anyone who wishes to translate such texts into a foreign language is not just the translation of the page’s meaning, but also its design.) In terms of the relationship between maps and streets, we can think of similar cases: the boundary between the USA and Canada, for example, follows the grid line of a map projection rather than the other way around. And the planning of streets by reference to grid systems is standard practice in North America. The difference between the organic nature of the earlier glossed books discussed by de Hamel, and the later modular ones, is that between old towns and new. The archetypal typographic grid, like town-planning grids, is used for pre-planning not description.

The logic of assembly involves not only those aspects of layout that are predetermined by a grid, but the repertoire of characters and contrastive techniques that are predetermined by available technologies. Mention has already been made of the general switch from the use of colour in

manuscripts to space in monochrome printed books (Twyman 1982). Elsewhere, Twyman (1970, 1986) has traced the connections between printing technology and the expressive repertoire in some detail.

Editorial intervention and artefact structure

Clearly it is not only printing technology but editorial practice that can act as a constraint on the writer's means of expression. One of the improvements over the traditional straight-line communication model claimed for my 'dog-leg' model is that it draws attention to the mediation of industrial processes in the transmission of text from writer to reader. These processes are institutional as well as technical.¹⁵³

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House styles, policed nowadays by copy-editors, are meant to ensure clarity of expression, and to make the printer's task easier and more consistent, but authors are sometimes ambivalent about their usefulness. Most copy-editors would agree with Butcher (1975: 1) that their role is 'to remove any obstacles between the reader and what the author wishes to convey', but it is not always easy to identify the obstacles to an author's satisfaction. Certainly most would accept the concept of a spelling mistake, but the 'rules' of syntax, punctuation and especially paragraphing are rather more tenuous. Even if authors can insist on their own punctuation practice,¹⁵⁴ it is almost unheard of for them to be able to influence typography once it has become enshrined in a house style.¹⁵⁵ When highly rule-bound and institutionalized, it seems, such conventional or genre structures can take on the inflexibility of artefact structures.

Bibliographers are especially mindful of intervention by editors and printers in the historical context. For most of this century bibliographers have been sensitive to the materiality of the texts they study. However, paper, type and ink mostly seem to be of interest as evidence for the dating or attribution of particular editions, and for routine description (McKerrow 1928) rather than as anything constitutive of the literary work itself. A central task of bibliography is to establish critical editions of literary texts that reflect the

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153 Many media sociologists would maintain that they are political also – but issues such as censorship and press ownership would seem to be far removed from questions of typographic theory.

154 Pullum (1984) rails against the punctuation (and other) policies of American copy-editors in an amusing but, in my experience, entirely accurate article entitled *Punctuation and human freedom*. He especially objects to their insistence on placing quotation marks outside adjacent punctuation, whatever the circumstances: anyone who has been published in the USA can confirm that it is impossible in the USA to distinguish between, say, /He said 'I'm leaving!' / and/He said 'I'm leaving!'/ . As Pullum puts it, 'many advanced cultures show no sign of the superstitious awe with which we regard copy-editors'.

155 My own experience of co-editing a volume for Academic Press in the USA was of an inability to persuade the publisher even to drop the excessive capitalization of chapter titles. After some negotiation on the exact form of words, we were able to insert the following neutral sentence into the preface: 'The typography of the volume conforms to the standards of The Educational Technology Series.' (Duffy & Waller 1985: xv)

author's original intentions and that minimize the problems of what Gaskell (1978) refers to as 'the variation of transmission'. However, although extremely detailed analyses of typographic factors are routinely used to trace the origin of particular editions, there is some controversy about the extent to which they should be considered part of the 'author's intent'. McKenzie (1981, 1986), especially, has taken issue with the bibliographic neglect of visual aspects of language.

Printed editions of literary works vary from their manuscripts not only in the obvious respects of letterforms, line-endings and page breaks, but also in such matters of spelling, spacing and punctuation as may be included in the publisher's house style. The bibliographic problem is to determine which of any changes that can be found between editions reflect the author's intention, and which are the result of unwarranted intervention by the printer or an editor. On the whole the actual words used are usually safe, but their typography, spelling, capitalization, emphasis and punctuation are not. It seems that the propensity of some authors to leave most aspects of punctuation, typography and even spelling to the printer, and of some printers to intervene even when it was not required, has led some editors to regard these matters as fair game for alteration (not only for popular but also critical editions). Sir Walter Greg (1950-1/1960) regarded the author's words as 'substantives' and the other matters as 'accidentals', but the exact borderline – indeed, the very distinction – is controversial.

Reference has already been made in Chapter 4 to Simpson's (1911) defence of Shakespeare's printer against later editors who assumed that, because it did not correspond with their own grammatical practice, the dramatic punctuation of the first folio was incorrect. This is echoed in the introduction to PH Nidditch's critical edition of Locke's *An essay concerning human understanding* (1975):

'The idea still persists that English printers in the seventeenth century took little notice of the formal features of an author's work as displayed in his manuscript.'
(p. xviii/xlix)

Nidditch cites evidence, from contemporary works by Milton and Newton for which manuscripts survive, that printers were more reliable than is generally supposed.¹⁵⁶ In Kuhnian terms, this may be evidence of a paradigm clash – the editors in question, applying a modern paradigm, are perhaps unable to see the reasoning behind the older system and put it down to ignorance or carelessness.

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¹⁵⁶ McKenzie (1986), who discusses some lines by Congreve with similar conclusions, suggests that subsequent editings have their own inherent interest for the critic: 'By reading other forms of [Congreve's prologue to *The Way of the World*], we can chart meanings that later readers made from it under different historical circumstances.' (p. 13).

Price (1939) cites evidence to defend sixteenth- and seventeenth-century printers against the charge that they made free with an author's grammar, but in doing so reveals where he draws the line between substantive and accidental features. The compositor of Sir John Harington's translation of Ariosto in 1591 evidently modernized his spelling, a feat for whose consistency Price is full of admiration:¹⁵⁷

'All these corrections he did of his head without any changes in the copy to guide him, and besides he was *continually altering the punctuation*. Yet his *fidelity to the text* is marvelous.' (p. 543, my emphasis)

Price's apparent acceptance of the continual alteration of punctuation as consistent with fidelity to the text presumably assumes fidelity to the sense of some true text that the manuscript only pointed toward but did not achieve. Harington was evidently happy with the changes – indeed, expected them – Gaskell (1978), who discusses the same work, tells us that Harington probably supervised revisions to the punctuation at proof stage. McKenzie (1981: 105) points out also that, from the evidence of his preface, Harington considered the needs of his readers carefully, and that the layout of the text (an extremely lengthy epic), with its marginal notes, index and illustrations 'clearly demonstrates the finely planned and purposive nature of the typography'.¹⁵⁸

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McKenzie cites a wide range of convincing examples of authors who are clearly aware of typographic form, and deploy it along with other linguistic resources.¹⁵⁹ He appeals for Greg's substantive/accidental distinction to be rejected in favour of a broader 'sociology of the text'. However, the problem will presumably remain that, unless books are to be reproduced in facsimile – and some, including works by Blake, Apollinaire and the concrete poets cannot be reproduced any other way¹⁶⁰ – editors are forced to make choices: no one expects the modern reader to cope with the long 's', for example.¹⁶¹ To the modern reader the distinction between the long and the short 's' is meaningless, and spellings that looked normal to a seventeenth-century

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157 The Harington manuscript was first discussed in detail by Greg (1923/1960).

158 It is interesting to see from the photograph of Harington's manuscript reproduced by Greg that, where a modern author would write his or her manuscript in the same hand and add instructions to set certain parts in italic, Harington actually adopts a different, cursive, hand for those parts (although this is apparently not consistent throughout the manuscript).

159 Bronson (1968) and Barker (1981) also describes the relationship between literary style, typographic format and other contemporary arts in the eighteenth-century.

160 There may be a case for a continuum of graphicness, analogous to Crystal's continuum of linguisticness discussed in Chapter 3. Massin (1970) reproduces an extensive range of texts – literary and otherwise – that merge graphic and linguistic features, including letters made from pictures, pictures made from letters, concrete poems, picture-letter puns and so on. None of them can be 'quoted', only pictured.

161 Bowers (1959: 148) reports that 'McKerrow, though reluctantly, modernised the Elizabethan long [s]; and this procedure has now become standard in old-spelling critical texts'. Presumably McKerrow must have changed his mind at some stage since in *An introduction to bibliography* (1928) he implicitly recommends the retention of the long 's' in his advice on transcribing title-pages.

reader just look archaic and opaque. If the past is a foreign country then perhaps the skill of editing is akin to that of translating. It would be interesting to conjecture about a wider range of such equivalences: for example, modern readers do not need and may simply not comprehend the use of braces to group the row headings in tables. Any editorial discrimination is a recognition of some kind of distinction, if not between the substantive and accidental, then between the relevant and irrelevant for some stated historical or critical purpose. A sociology of texts would presumably require editors to at least declare their position on a much wider range of text features than is traditional. Twyman's (1982) quest for the underlying 'language element' that underlies typographic arrangements is clearly as relevant to bibliography as it is to the specification of 'device independent' displays.

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Moreover, so long as so many authors continue to be indifferent to the visual form of their work (or to capitulate to the forces of house style), the distinction between substantive (author's) and accidental (artefactual or editor's) features has some basis in present reality. Given that, as McKenzie (1981) suggests, 'modern books...are notorious for smoothing the text and dull our sensitivity to space as an instrument of order', it is little wonder that editors, from their modern perspective, fail to notice the full texture of literary works of the past. In addition to the historical dimension of a sociology of texts, which would presumably seek to sensitize bibliographers and literary editors to a broader range of factors than they now notice, we perhaps need to extend our modern concept of literacy to include the full range of expressive tools implied by that concept. If authors are to treat the graphic arrangement of their words as substantive, they ought to be as sensitive and fluent in that aspect of writing as with any other – especially if they use the newer desk-top publishing systems with their extensive typographic facilities.

Medium and message

This last suggestion begs an important question. Are writers – or what ever less-restricted term might be substituted for one who prepares graphic language of whatever kind – indifferent to graphic forms because they have nothing they wish to say that requires them, or is it the other way around? 'The other way around' being: do they find little to express graphically because they are unaware of (or unable to operate) the means of saying it?

This question has been debated by linguists for many years, in the form of the Sapir-Whorf hypothesis, named after the American linguists Edward Sapir and Benjamin Lee Whorf, who maintained that languages determine

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not only the way we express our thoughts, but the way we think.¹⁶²

Gombrich (1984: 188) picks up this debate, describing how:

‘in describing the same painting in German or English I had to take the goods which were on offer¹⁶³ and thus had to single out different aspects of the same painting...The grid or network of language we impose on the landscape of our experience will inevitably result in different maps.’

Gombrich’s remarks bring to mind Harris’s use of the map reference grid analogy, discussed earlier in the chapter. Indeed, the metaphor of language as a grid seems to be quite a common one. It is found in Saussurean linguistics, where words are said to relate to other words both horizontally (syntagmatically) and vertically (associatively). Ivins (1953: 53) compares both words and images to fishing nets that only catch such fish as cannot swim through or escape:

‘in the same way words and visual images catch only the things or qualities they are adequately meshed for’.¹⁶⁴

Although most scholars who discuss the relationship between language and concepts are careful to distance themselves from Whorf (for example, Gombrich 1984: 189; Goody 1977: 9), the relationship of artefact and expression, medium and message, has been discussed widely in recent years. ‘The medium is the message’ is a catch-phrase associated with Marshall McLuhan (1962) whose *Gutenberg Galaxy* was largely responsible for bringing the study of media effects to the wider public consciousness. So many aspects of modern Western society are bound up with literacy that it is of obvious interest to contrast non-literate and literate societies, and to link the introduction of literacy to social, economic and political events in history. Some very bold claims have been made for the influence of the new communication technologies on the history of ideas – and even on the evolution of human cognitive processes.¹⁶⁵

In cultures without writing – parallels are drawn between ancient pre-literate civilizations and modern non-literate tribal cultures – it is

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162 Many textbooks on linguistics and semantics contain summaries of the debate surrounding the hypothesis, which is also known simply as the ‘Whorfian hypothesis’ or as ‘linguistic relativism’ (eg Lyons 1977: 245; Sampson 1980: 81; Harris 1981: 131). Lyons contrasts it with functionalism – whereas relativists would claim that languages delimit thought processes, functionalists would maintain that the structure of different languages results from the expressive requirements of particular societies.

163 Gombrich’s use of the term ‘goods’ alludes to a sonnet by IA Richards in which he, in effect, comments on the Sapir-Whorf hypothesis: ‘Our mother tongue, so far ahead of me, / Displays her goods, hints at each bond and link, / Provides the means, leaves it to us to think, / ...’

164 Elsewhere, in a variation of the metaphor, he criticizes the excessively systematized techniques of certain virtuoso engravers as ‘webs spun by these spiders of the exactly repeatable pictorial statement.’ (Ivins 1953: 71)

165 Scribner & Cole (1981) describe this debate and, on the basis of their comparison of literates and non-literates in an African society, suggest that any improvements in performance of intellectual tasks due to literacy are confined to the individuals concerned and are task-specific: ‘There is nothing in our findings that would lead us to speak of cognitive consequences of literacy with the notion in mind that such consequences affect intellectual performance in all tasks to which the human mind is put.’ (p. 86)

generally agreed that knowledge is heavily coded for memorization and recitation.¹⁶⁶ It is formulaic and rhythmic in structure, and often expressed in terms of proverbs, legends, riddles and verses. Meaning is thus not explicit, and interpretation relies instead on prior knowledge, context and ‘wisdom’ – a priesthood, even, qualified to interpret. Several commentators (for example, Havelock 1976, 1986; Olson 1977) regard the relative *autonomy* of written language – its ability to convey reliable and consistent meanings across differences in audience and context – as central to its cultural significance. However, considerable confusion seems to surround the part played by graphic features in these developments. Whereas Eisenstein (1979) regards the introduction of spatial features as a major contribution of the introduction of printing towards the development of modern science, Havelock – whose subject is literary rather than functional text – appears to see it as retrograde.

Havelock (1976) has argued that, because oral culture is so ritualized, opportunities for creative expression and individual interpretation are strictly limited. The mnemonic nature of oral texts means that they act as a force for the retention of existing knowledge within a society rather than a tool for exploratory thinking and debate. In Havelock’s view, early writing systems, too – pictographies and syllabaries – were not sufficiently precise to act as more than aids to memory and should therefore be considered as features of oral culture. Havelock sees the development of alphabetic writing by the Greeks as the key to the true literacy that, since it enabled the fast and accurate transcription of speech, provided the basis for texts whose meaning was autonomous and therefore potentially original. Following on from Parry (1971), who identified the formulaic structure of Homer as characteristically oral, Havelock (1986) has traced the development of Greek thought and language as the autonomous nature of written text was discovered. His main interest is in the tracing of linguistic changes after alphabetization – the gradual replacement of what he terms the language of doing with the language of being:

‘the linguistic symptoms of this radical shift away from oralism ... occurred in a proliferation of terms, for notions and thoughts and thinking, for knowledge and knowing, for understanding, investigating, research, inquiry.’ (p. 115)¹⁶⁷

Interestingly, in the present context, he also suggests that ‘topicalization slowly increases its presence in classic Greek’ (p. 103).

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¹⁶⁶ There is a considerable literature on orality and literacy, some of it somewhat apocalyptic in character (for example, Innis 1951, McLuhan 1962). Ong (1967, 1982), who appears at times to be gripped by a nostalgia for tribal culture, celebrates orality at some length in contrast to what he terms the ‘logocentricity’ of Western civilization; an influential anthropological and sociological view is argued by Goody (1977, 1986); and current linguistic and psychological interest is represented in the collections edited by Tannen (1982) and Olson, Torrance & Hildyard (1985).

¹⁶⁷ Lloyd (1966) also remarks on the development of new terms, or at least adaptations and better definitions of existing terms, for use in logic.

Two puzzling aspects of Havelock's argument may be noted here. Firstly, his claim for such overwhelming advantages for alphabetic writing rests on the assumption that other writing systems provide little more than a mnemonic for the recital of known information, and are therefore incapable of supporting abstract or creative thought. Indeed, at one point, with breathtaking chauvinism, he suggests that

‘a Japanese can orally express what the West has taught him. Transferring the statement to his own script, he will then be able to recognize and to read what he already knows, as did the scribes of antiquity. But the free production of novel statements in his own script will remain difficult.’ (Havelock 1976: 84)

Secondly, the phonetic equivalence of alphabetic writing, coupled with the normal lack of word separation (see Chapter 4), links Greek writing closely with speech. Indeed, Havelock (1976) appears to regard the Greek alphabet as a complete inventory of the phonemes in the Greek language – a view dismissed by Harris (1986: 118), not in specific relation to Havelock, it should be added, as ‘simply a fourth-form howler of the most elementary order’. So, while basing much of his theory on the objectifying effect of writing that separates language from its speaker, Havelock prefers to ignore, even to exclude, visual aspects of the medium.¹⁶⁸ This is surely a strangely misguided purism, since the ability to manipulate ideas in space (rather than in linear acoustic form) would seem to give the logician an advantage – witness the development of symbols in logic, introduced to a limited degree by Aristotle (Lloyd 1966).¹⁶⁹ It is possible, then, that if progress in Greek philosophy can be linked to writing – and it seems to be generally accepted that it is¹⁷⁰ – it was achieved not as a direct result of their particular technology of writing but as a more general consequence of literacy – that more people could engage in dialogue and that progress could be recorded.

Although they mostly build on the work of the classicists (Parry and Havelock), other scholars (Chaytor 1945; Ong 1958, 1967, 1982; McLuhan 1962), have seen the invention of printing, not of alphabetic writing, as the pivotal event that turned Western civilization from a mainly oral to a literate tradition.

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¹⁶⁸ Elsewhere Havelock (1976: 15) is uncompromisingly opposed to any attention to the visual appearance of writing: ‘Strictly speaking, writing should behave solely as the servant of the spoken tongue, reporting its sounds as accurately and swiftly as possible [...] it is a sign of the arrival of modern scientific and socialized man that calligraphy as an art form has largely expired.’

¹⁶⁹ Evans (1980: 35) refers to evidence that ‘Aristotle’s works were almost certainly illustrated with diagrams, and while it is unlikely that the Platonic dialogues were, commentaries on them employed figures extensively’. Gardner (1958) discusses a number of instances of diagramming and modelling by logicians from the middle ages to the present day. Even when they don’t actually use diagrams, philosophers frequently employ diagrammatic or spatial metaphor: for example, Toulmin (1958) entitles a chapter of *The uses of argument*, ‘The layout of arguments’, but solely in a metaphorical sense.

¹⁷⁰ In *A history of western philosophy*, Bertrand Russell (1946) seems to take it for granted that the writing systems available to early civilizations had a direct bearing on their progress in philosophy.

Ong's account of the influence of the Ramist method has already been described (Chapter 6). Just why he should attribute spatial thinking to the technology of printing – a technology which to this day penalizes attempts to integrate word and image – is not very clear. Yates (1966: 230) takes issue with him on this point:

'Rather, it would seem to me, the printed Ramist epitomes are a transfer to the printed book of the visually ordered and schematized lay-outs of manuscripts.'

In part, Ong's argument is similar to that of Ivins (1953), to which reference was made in Chapter 3 – that reliance on graphic forms in the manuscript age was inhibited by problems of inaccurate copying.¹⁷¹ But, waxing somewhat metaphysical, he also suggests that the technology of movable type, and therefore movable letters and words, was suggestive of ideas as objects in space:

'Now the printer's font where types are kept comes into being – a real "place," where *elements* of discourse, reduced to a visually apprehensible and spatially maneuverable form, are stored.' (Ong 1958: 310)

Although he does at one point acknowledge that diagrams and spatial arrangements were also used in the age of manuscripts, Ong's idea of print as a newly spatial medium gains authority in his writings from frequent repetition.

Ong is rebuked for this oversimplification by Eisenstein (1979), who prefers to see print as a transition not from an oral to a literate culture, but from one kind of literate culture to another. Eisenstein, though, is questioned in turn by Twyman (1986: 205) who remarks on her 'repeated reference to the proliferation of charts and tables...following the invention of printing':

'My impression...is that one of the consequences of the invention of printing was to stifle the range of configurations of graphic language in much the same way as it manifestly changed the book from a colored artefact to a monochrome one.'

Even today any arrangement that departs from conventional linear-interrupted prose is difficult, costly and discouraged by publishers (Biderman 1980). Twyman excludes non-linear images (printed as single plates) from his comments, but even here it is clear that print enforced a separation of word from image. Eisenstein herself remarks:

'That the printed book made possible new forms of interplay between these diverse elements is perhaps even more significant than the change undergone by picture, number or letter alone.' (p. 55)

Elsewhere, though, she appears to contradict this:

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¹⁷¹ Although, whereas Ivins refers mainly to medical and botanical studies where verisimilitude is relatively important, the Ramist charts Ong attributes to the age of print are rather more robust. In fact, Evans (1980: 35) reports that even in the manuscript age 'available evidence suggests that, compared with representational images, diagrammatic designs are transmitted with remarkably little variation'.

‘In the field of book illustration, at least, what happened in the late fifteenth century resembled a divorce rather more than a reunion. When the graceful lines that linked text to marginal decoration were severed, pictures and words were disconnected’ (p. 258).¹⁷²

This last comment is reinforced by Evans (1980) and Camille (1986), who demonstrate the pervasive use of images and diagrams, highly integrated with accompanying words, in the manuscript age. From this evidence, together with other studies of medieval ‘typographic’ layout, it is becoming clear that the modern genre of typographically organized book, such as the *Handbook of Sailing*, has more affinity with medieval books than with the typical products of the first few hundred years in which printing was dominated by the letterpress system. The ‘standard book’ that emerged from the first hundred years or so of printing discouraged the multi-column layouts of medieval books (Parkes 1977, de Hamel 1984), their variety of script styles (Ullmann 1932; de Hamel 1984), their use of colour as a cue (Twyman 1982) and their close integration of illustrations and text.

The model outlined in Chapter 5 suggests that any such affinity between genres (or common membership of a single genre) will be based not only on a similar set of artefactual constraints, but also on similar demands of the topic structure and similar patterns of access among readers. The next chapter discusses some aspects of what the model termed ‘access structure’, before going on to consider the nature of genre in more detail (Chapter 9).

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172 It is actually rather difficult to determine exactly what Eisenstein’s position is. In a recently published essay (1985), she discusses some of the motivations underlying *The printing press as an agent of change*, suggesting that she developed her view that printing led to an increased use of iconic images in response to an earlier characterization of herself as holding the opposite view. She claims that imputed to her had been a formula that the advent of printing moved Western Europe ‘from image culture to word culture’ – since ‘a latent iconoclasm was reinforced and the medieval justification for allowing graven images in church was weakened by print’ (p. 20). Her revision of this earlier notion may account for her apparent overstatement of the opposite ‘word to image’ formula.

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Access structure

In this chapter I shall discuss further some aspects of the relationship of the reader to the text that were introduced in Chapter 5. Although it has been argued that technologies of writing and printing constrain what may be said, it is also arguable that the relationship of medium and message works both ways. That is, technologies are themselves developed in response to the needs of users. While the invention of printing might have accelerated the Renaissance, it was also a response to it – most of the technology had been around for some time before the vital connection was made and the market for books warranted the considerable investment required.

Designing for different purposes

In Chapter 7 it was noted that the requirements of medieval scholarship (which was dominated by biblical scholarship) led to further developments in book design to accommodate glosses in a more ordered manner.¹⁷³

Gullick (1986: 207) suggests that

‘The work of assembling the authorities, comments, and of devising ever improved layouts to make the act of reading easy is one of the great monuments of medieval scholarship and page design’.

Even today the design of bibles can provide a good demonstration of the influence of users on formats, since the Bible is an example of a text whose wording, while it can be retranslated and glossed, cannot be changed in substance. As Table 8.1 demonstrates, a wide range of user needs are currently catered for. Bernhardt (1985) has also compared a range of texts that address the same topic but with different purposes (see Chapter 1). In his sample texts, though, everything about the text differs in response to the needs of the anticipated audience – scope, argument and language, as well as format and typography.

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173 Modern biblical scholarship is also surprisingly relevant to the present study. The fields of content analysis, hermeneutics and discourse analysis all have roots in the need to determine the authorship of scriptures and to suggest procedures for translation into new languages. In particular the Summer Institute of Linguistics, founded by the tagmemic linguist Kenneth Pike, is a missionary organization. One of its associates, Robert Longacre, a major figure in discourse studies, is centrally concerned with Bible translation.

Edition	Purpose
Traditional leather-bound bible	Binding (limp leather, rounded corners, etc) protects against wear; double column is for legibility and to display verse structure. May have 'churchy' connotations.
Pocket-size bible	Requirements of legibility are subordinated to convenience of carriage.
Tiny white bible	To be presented or carried on special occasions; available in presentation boxes for different occasions (weddings, first communions, etc).
Paperback bible	Cheap enough to be given away by evangelists and the Bible Society.
Lectern bible	Convenience of carriage and storage subordinated to legibility and symbolic prominence.
<i>The Bible designed to be read as literature</i> (Heinemann 1937)	To be read in continuous fashion; design discourages the 'proof-text' style of reading.
Loose-leaf and wide margin versions	To encourage cross-referencing and writing of notes; used for sermon preparation.
'Red-letter' bible	Words of Christ highlighted for devotional reading and as an aid to rote learning.
Family bible	Archival function, with space for a record of births, deaths and marriages. May reflect a symbolic function in its large size
Computer disk bible	(For example, <i>The Word Processor</i>) include search facility to remove need for separate concordance.
Chain-reference bible	Designed specifically to encourage doctrinal study through linked proof-texts.
Parallel & polyglot bibles	Different languages or translations are printed on opposite pages, or alternate lines, for easy comparison.
Children's bible	Includes pictures and explanatory notes.

Table 8.1 The different forms in which the Bible is available reflect the range of uses anticipated by publishers.

The interplay between function and genre is clear from some of these examples – *The Bible designed to read as literature*, especially, proclaims what it expects from its imagined reader by explicitly 'quoting' another genre (classic literature). Children's bibles can look like children's fiction, partly because they share the same functional constraints, but partly, one suspects, to exploit the readers' loyalty to the more popular genre.

Religious objects are, of course, particularly prone to acquire symbolic connotations, however functional they may also be. Indeed, the development of the codex form among early Christians is ascribed by Roberts & Skeat (1983) to the demands of genre. Although codex-like notebooks were in existence during the first century AD, the roll was the

main book format and continued to be used for certain (especially legal) purposes throughout the middle ages and beyond. Yet the vast majority of early Christian writings are in codex form. Although its advantages seem obvious to us today, Roberts & Skeat are not convinced that it was adopted by Christians for exclusively practical reasons. For one thing, they were not the only group for whom ease of reference and compactness would be attractive. Moreover, those who were used to rolls appear to have found little difficulty in finding their way around, and the surprisingly slow introduction of seemingly obvious reference devices, such as line or page numbering, indicates that cross-reference was not a priority in the early church. Roberts & Skeat's tentative solution to the problem is that the first gospel, or, alternatively, earlier notes of the sayings of Jesus, might have been written on codex-like notebooks and that the format might thus have acquired a symbolic value (aided by its dissimilarity to pagan and Jewish rolls).

This pattern of development seems to be entirely normal – that is, access structures, those most functional and directly audience-related of text components, are adopted, in part, because of their connotations. The evolution of new methods happens because people copy good ideas – not always because they have analysed them in depth. Black (1956, 1961) traces the establishment of Bible printing practices in the first half of the sixteenth century – the story seems to be of one major innovator (Robert Estienne) responding to the needs of users (the new style of independent Bible reader of the Reformation), and other printers copying the model thus established. Black shows that Estienne himself owes much to the manuscript tradition.

At much the same time, many of the access devices we now take for granted developed in response to the growing number of readers, and the build-up of science and literacy (Steinberg 1974; Eisenstein 1979). Indexes and cross-references were made possible by the multiple reproduction of books, but they relied, too, on those books being numbered.

Numbering systems

A document without page numbers is almost unthinkable today, even when some other system, such as paragraph numbers, is also present. However, page numbers, a system on which a number of other access systems depend, appear to have taken some time to become fully established. Although a fair number of early books had page numbers (Turner 1977), Roberts & Skeat (1983: 51) report that

‘in the whole of ancient literature there is no example of a page reference being given, and the reason is obvious, namely that no two manuscripts are identical.’

Instead they suggest that page numbers were useful for binding and for checking that no pages were missing.

The ubiquity of page numbering today is partly ensured by its inclusion in printers' and publishers' house styles, but this was evidently not the case with most early printers. Smith (in press) has suggested some reasons why the introduction of folio or page numbering was relatively slow. Firstly, she argues, other reference systems work just as well, and, secondly, in some circumstances – fictional or devotional works, for example – bookmarks suffice and reference systems are often unnecessary.¹⁷⁴

Even so, the advantages of page numbers seem so overwhelming that it is hard not to put down their slow introduction to the unquestioning conservatism that is inherent to craft traditions. Quite apart from their use in indexing and cross-referencing, numbering systems are, as Roberts & Skeat suggest, useful for the making of books and documents. Even in the printing of folio editions, quite apart from the multi-page sections common today, pages must be laid out (or 'imposed', in printers' jargon) so that they can be printed from one forme and folded with the pages in the right order. Even in the simplest documents, numbers are useful for collation and checking.

Smith distinguishes between 'arbitrary' and 'non-arbitrary' numbering systems, using the terms in much the same way as my own 'arbitrary' and 'meaningful' artefact structures (Chapter 7). Page numbers indicate *arbitrary* divisions of the text – whether or not pages are treated as topic frames. Many books contain more than one series of page numbers, but generally for technical rather than semantic reasons. For example, preliminary pages traditionally employ roman numerals, with the main arabic series starting on the first page of the 'main text'. The functional purpose of this is to allow the preliminary pages and index to be compiled after the main text has been paginated (Butcher 1975). Technical manuals often use a separate numbering series for each chapter or section, so that a single section can be updated without reprinting the whole text.

Non-arbitrary reference systems include: the numbering of *lines* (termed 'stichometry' by palaeographers),¹⁷⁵ where line endings are meaningful,

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174 On the whole, this is still the case, although the advent of literary criticism and media studies means that any text is liable to be cited in an academic context. Page numbers are also useful when the bindings of cheap novels disintegrate and pages must be reassembled. It should also be remembered that, in the literary or poetic context, language is the artist's subject as well as his or her medium. Eighteenth century writers, such as Sterne, Fielding and Swift, were especially prone to comment on formal aspects of books as printed objects. McKenzie (1986) has discussed specific allusions to page numbering by Joyce.

175 Thompson (1912) reports that stichometry was mostly used as a means of computing the payment due to scribes – much as modern printers are paid per thousand ens of set. However, he also reports instances of manuscripts with every hundredth line or verse marked for reference purposes (or some other interval).

as in poetry, computer programs, and some reproductions of text as data for linguistic or bibliographic analysis; the numbering of *paragraphs*; and the numbering of *headed sections*. Line numbers are clearly a specialized form, but paragraph or section numbers have a general utility which has been more obvious at some times than at others. Parkes (1976) has shown that numbered sections became an essential part of the apparatus of late medieval scholarship, and they are in common use today in certain types of text (notably, technical reports and textbooks).

A question at least as obvious as ‘why did page numbering take so long to catch on?’ is ‘why haven’t non-arbitrary numbering systems become more widely used?’. Their utility was clear in the manuscript age, since references could be cited even though each copy of a work would have different page breaks. They have become a standard feature of Open University courses because they aid the discussion of texts by groups of writers or students. They also have advantages for printers, who need not delay the setting of internal cross-references and indexes until the pages are established.

A confident and accurate answer would require a historical survey of some kind, but an intuitive response is to focus on the rhetorical effect of numbering systems.¹⁷⁶ For some, numbered sections may be symptomatic of what Nash (1980) termed ‘programmed’ text (Chapter 4) in which the numbers are something of a cohesive cop-out. The numerical order gives an element of apparent continuity which enables writers to avoid making the connections between paragraphs explicit. This is certainly observable in the drafting of regulations and technical documents, where no argumental flow between paragraphs is normally considered necessary. Instead, subsumed under a common heading, such paragraphs relate to each other as items do in a list – that is, only by virtue of their common membership. Some writers are sensitive to such associations, and may additionally feel that to show a new paragraph with a line space and a number, rather than a new line and indentation, is to make more of a break than they would prefer; numbering may also have an inhibiting effect on the occasional instinct to write a very short paragraph.

The connotations of paragraph numbering may be of either excessive or inadequate linguistic cohesion. Whereas simple series of numbers (1...n) may look as if paragraphs are just a series of unconnected *pensées*, a structured series (1.1, 1.2...1.n...n.1, n.2 etc) may look excessively organized. The distinction is aptly illustrated by comparing the numbering of Wittgenstein’s *Tractatus logico-philosophicus* (1922/1971) with that of his later *Philosophical investigations* (1958). The highly structured six-level numbering system of the *Tractatus* reflects its positivist philosophy and

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176 I have published a fuller version of this argument, with examples, elsewhere (Waller 1977).

its apparent goal of completeness and self-sufficiency.¹⁷⁷ The later work, though, reflects a quite different attitude to language and logic and is presented as a sequence of sometimes unconnected remarks, numbered in a simple series. Access structures, although strictly functional, may nevertheless carry connotations of the genres with which they are most closely associated.

Page layout as access structure

Even in the days when numbering systems were rare, of course, ideas always had a constant location within the copy each individual reader happened to have access to; and individuals would sometimes supply their own referencing systems. This stability of graphic layout, combined with the fact that books, being scarcer than today, were probably more intensively studied, might well have obviated the need for the elaborate access systems required by today's readers.

The Roman rhetorician Quintilian appears to have regarded the layout of pages (or wax tablets, rather) as a 'more expeditious and efficacious' variation of the elaborate place-memory systems recommended by most rhetoric teachers of his era. He advises the student

'...to learn by heart from the same tablets on which he has written.; for he will pursue the remembrance of what he has composed by certain traces, and will look, as it were, with the eye of his mind, not only on the pages, but on almost every individual line, resembling, while he speaks, a person reading.' (Quintilian, Book XI, Chapter II, 32)¹⁷⁸

Saenger (1982: 396) comments that 'the new readily available university texts of the later Middle Ages, replete with chapters, subdivisions, and distinct words, made possible a form of memorization based on the retention of the visual image of the written page'.

Many people (and I am one) can supply anecdotal evidence that they are sometimes able to locate ideas in books, even if not memory, simply from their location within the book – they remember whether the page is near the beginning or the end of the book, and whether the idea is at the top or the bottom of the page. The educational psychologist Ernst Rothkopf (1971) tested this hypothesis in an experiment and reported evidence that seems to confirm such intuitions.

This informal use of the appearance of a page for information retrieval is threatened by recent developments in electronic publishing. 'Dynamic text'

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¹⁷⁷ Hewson (1983) has analysed the numbering system of the *Tractatus* from a typographic viewpoint, and made some critical observations about its effectiveness.

¹⁷⁸ Yates (1966: 41) comments: 'I understand this to mean that this method adopts from the mnemonic system the habit of visualizing on "places", but instead of attempting to visualize shorthand *notae* on some vast place system it visualizes ordinary writing as actually placed on the tablet or page.'

or 'hypertext' (Weyer 1982; Conklin 1986) offers the reader an interactive reading environment. Text is presented on a computer screen in a nested form – the reader points (with a 'mouse') to a heading and the relevant section of text 'unwraps' on to the screen. He or she may also point to a word and obtain a definition or a cross-reference (diagrams may be similarly unwrapped).

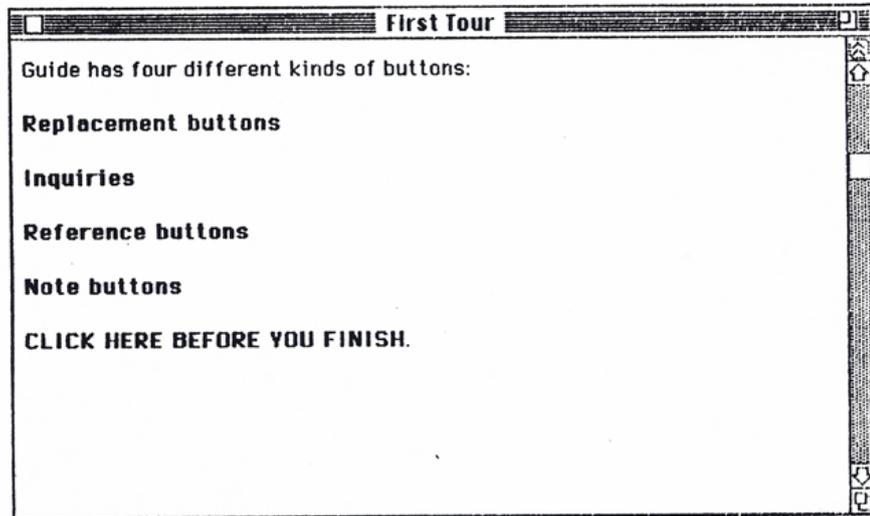


Figure 8.1a. A screen 'page' from a text prepared on the *Guide* dynamic text system (Brown 1986).

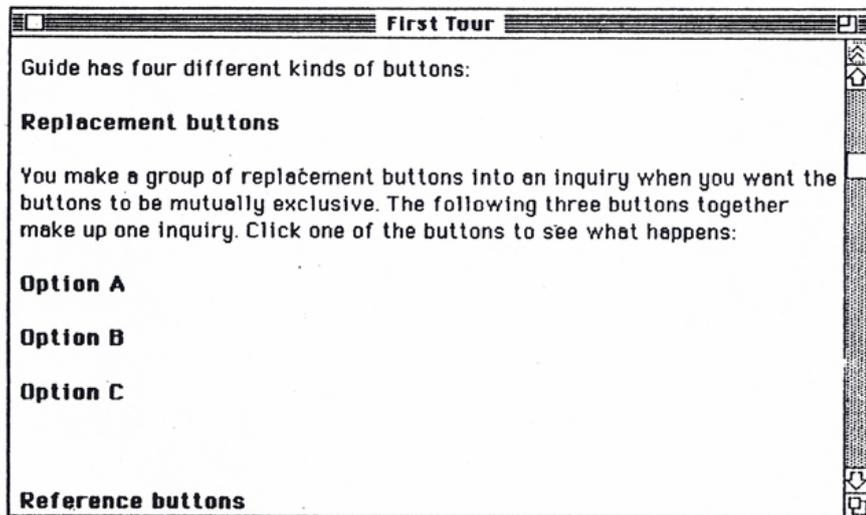


Figure 8.1b. The 'same' page after a reader has unwrapped a heading.

In the implementation of this concept shown in Figure 8.1 it is apparent that after the reader has unwrapped a heading, the relative positions of other headings and components has altered. Although a certain amount of 'undoing' is allowed by the system, it may be impossible to retrieve a 'page' on a subsequent occasion in exactly the same form. It may also be impossible for the writer to predict the precise juxtapositions that might arise when a text is actually used: many of the usual cohesive techniques

(for example, the use of forward and backward reference) are placed under considerable strain by dynamic text.¹⁷⁹ The problem is compounded by the fact that, in some applications (including the one illustrated in Figure 8.1), readers can annotate or change the author's original text. Unless some way of attributing such changes to individuals is built into electronic text systems, this could suggest a bibliographer's nightmare.

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Electronically delivered text focuses us on features of books and reading that we mostly take for granted, especially their physical nature. Garland (1982: 5) comments:

'Whenever I rhapsodize about the opportunities presented by the electronic media, at the back of my mind I find myself thinking, "Yes, but a book is a book is a *book*. A reassuring, feel-the-weight, take-your-own-time kind of thing..."'

And, as Kerr (1986) has pointed out, electronic text does not allow you to stick a finger between two pages while examining a third. The active reading strategies encouraged by educators (Chapter 4) assume that the text remains stable. Readers need to be able to build a mental map of the text as a physical object, in which headings, illustrations and other graphic features act as landmarks. It must also be asked whether the amount of information to view at any one time has an effect on our ability to understand complex arguments. In the 25 line display typical of current computers, there is a higher probability that the beginning or end of the sentence you are reading will be out of sight.¹⁸⁰

Benest & Morgan (1985) recently developed a prototype electronic text system that emulates traditional books. Readers are presented with realistically-sized 'double-page spreads' with shadows imitative of the bulk of a real book – the shadow is larger on the right-hand side at the beginning of the book, and larger on the left-hand side at the end. By touching a mid-point of the shadow, the book opens at that point, and single pages can be touched a dog-ear at the corner of the page. There is a potential in such a system for book-marks, note-taking, and all the traditional features of printed text, without losing sight of the extra electronic potential for on-line dictionaries, cross-referencing and easy up-dating.¹⁸¹

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Benest & Morgan's system may be seen as an instance of the normal progress of new communication techniques, which often require a transitional period in which they imitate the old, and in which new expressive and interpretative techniques can gradually develop. For

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179 Writers conventionally treat texts as if they are static physical objects – to keep track of their linear arguments even the most 'codified' of prose has indexical features – words or phrases which point to some other part of the (static) text. References which point backwards, forwards or to the immediate textual environment are known, respectively, as *anaphoric*, *cataphoric* and *deictic*.

180 I have published a slightly fuller version of this argument elsewhere (Waller 1986).

181 Burrill (1986) has also proposed a system that imitates a number of book-like features.

example early printed books imitated manuscripts,¹⁸² and early film-makers used fixed cameras in imitation of the fixed viewpoint of the theatre audience. In a welcome contrast to some of the ‘literacy revolution’ theories already encountered, Hirsch (1967) suggests that

‘the transition from script to print was rarely dramatic...[it] was continuous and broken, and I venture to say that all great discoveries, all so-called new movements, harbor the same contrasting elements, continuity and radical change.’
(p. 1–2)

Co-operative and uncooperative media

It is arguable that the introduction of greater accessibility has had the effect of turning text from what Cherry (1966: 16) termed an uncooperative medium into a co-operative one. A spoken conversation is the archetypal co-operative medium, since the participants must agree on the topic, when to interrupt or give way, and when to finish. An unsegmented written text, on the other hand, gives the reader little option but to start at the beginning and continue reading until the end is reached – or to cope with the insecurity of random encounters. The greater the degree of segmentation of written language, and the greater the degree to which segments are labelled and indexed, the more co-operative the text becomes. The accessibility afforded by typographic structuring, and typographically-structured adjuncts such as headings, contents lists and so on, can be seen as the basis of a conversation between reader and text.

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Although conversational models of written text have been proposed (Chapter 5), the detailed study of co-operation in discourse has, not surprisingly, focused on spoken conversations. In fact, with a few exceptions, ‘discourse’ is normally assumed by linguists, sociologists and others involved in this interdisciplinary field to be spoken (for example, Gumperz 1982, Coulthard 1985).¹⁸³ One of those who uses the term in relation to text, Hoey (1983: 27), refers to the doctrine of the primacy of speech to justify his view of text as containing implicit dialogue:

‘If dialogue has primacy over monologue, it is but a small step to seeing monologue as a specialized form of dialogue between the writer or speaker and the reader or listener’.

.....

¹⁸² Smith (in press) suggests that this conservatism might be in part due to the fact that early printer’s copy often consisted not of an author’s draft, but a ‘published’ manuscript edition.

¹⁸³ A problem with a number of accounts of ‘discourse processes’ is that, although they usually acknowledge important differences between written and spoken texts, the distinction is not carried through to all stages of analysis. De Beaugrande and Dressler (1981), for example, use only examples of spoken conversations in their chapter on situationality (the handful of written examples use passages of dialogue), but their chapter on coherence appears to assume the inspection of a written text by a reader. Brown and Yule (1983), whose textbook on discourse analysis is in most respects a model of clarity, also veer between spoken and written examples. In the context of ethnomethodology, McHoul (1982) has challenged the exclusive concern of its leading figures with immediate social contact. Reading, a solitary activity, is not regarded by some as a social act.

Clearly we should be careful about applying concepts developed for one medium to the other.¹⁸⁴ Telecommunications apart, spoken conversations involve the physical presence of both participants who share a common situation: they share the place in which the conversation occurs, the physical presence of objects to which they may wish to refer, and the social setting. However, since discourse analysts ascribe many aspects of the management of conversations to prosody and paralanguage, and since typography and punctuation is seen as the graphological equivalent of paralanguage, it is worth reviewing the role of typography in the light of some recent studies of the pragmatics of discourse.

Grice's Co-operative Principle

The philosopher HP Grice (1975) has made an influential and widely cited study of co-operation in discourse. Although he assumes the context of a spoken conversation, we must clearly take note of his theory if we are to apply a conversational model to written text; and in any case it has a more general significance for our concept of language. Grice's theory of 'conversational implicature' has become widely accepted as an explanation of the fact that the language of conversations is frequently indirect. Take the following exchange, for example:

A: I can't find any whisky

B: John was here

The sentence meanings of this exchange do not adequately explain the sense actually made of these statements by the speakers, although we have no difficulty in constructing a scenario in which the conversation might occur. John might have drunk the whisky, or it might have been hidden because John, a temperance campaigner, was coming. The knowledge shared by A and B would ensure that A knows which of the alternatives is more likely.

Grice describes a 'co-operative principle' which governs our contributions to conversations, and which we assume others will also obey:

'Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged' (Grice 1975: 45).]

This is expanded into four maxims which we are said to normally obey and expect others to obey:

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184 This caveat applies in both directions. We have already noted (Chapter 3) how, in spite of the doctrine of the primacy of speech, linguists have to edit language samples to conform with grammatical rules that are only actually adhered to strictly in text.

Quantity	Make your contribution as informative as required for the current purposes of exchange. Do not make your contribution more informative than required.
Quality	Try to make your contribution one that is true, specifically: do not say what you believe to be false; do not say that for which you lack adequate evidence.
Relation	Make your contributions relevant.
Manner	Be perspicuous, and specifically: avoid obscurity; avoid ambiguity; be brief; be orderly.

In our example, then, A can assume that B is co-operating and that his or her answer is therefore relevant and adequate.

In practice the maxims are not always easy to distinguish. For example, a violation of Manner, resulting in incomprehension, might be diagnosed by a reader as a problem of Quantity (more information required) or Relation (different information required). In fact for practical purposes, Manner is not a particularly helpful category – it is contradictory, for one thing (to ‘be brief’ might lead to ambiguity)¹⁸⁵ – and could be seen as simply an injunction to obey the other three maxims.

In a conversational setting, people can directly challenge apparent violations of these principles by requesting more, clearer or better information. However, the co-operative principle is so strong that rather than do so, they may make a further inference that the ‘violation’ was intentional and therefore ironic. Or they may construct an alternative scenario in which the violation does in fact make sense.

Quality obviously applies equally well to text as to speech, although, since readers cannot directly challenge writers, their trust in written testimony cannot be guaranteed – as Clanchy (1979) observes in relation to the gradual development of trust in written records by medieval readers. Today, publishers act as gatekeepers to the public domain, and in scientific publishing there are organized systems of validation and refereeing (Gordon 1980). Trust is partly engendered by the reputation of a journal or a publisher, which has to be won from the community of readers and critics.¹⁸⁶ The concept of public relations, though, rests on the assumption that trust can be engineered by correct attention to forms of presentation – it is not entirely to the credit of typographers that such a large part of the profession, and its educational system, is geared to this end. The confidence engendered through presentation seems to be hard to escape from. A

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¹⁸⁵ As Shuy & Larkin (1978) have pointed out in relation to the language of insurance policies, the goals of non-ambiguity and brevity may be incompatible. Bhatia (1983) makes a similar point about legal texts and suggests a graphic ‘easification’ method as an alternative to simplification.

¹⁸⁶ It is interesting that Clanchy (1979: 103) notes that in medieval times ‘the commonest sign of an amateur writer is bad layout’.

notable attempt is the scientific journal *Evolutionary Theory*, apparently respected by the scientific community, which appears in an extremely amateurish, home-made form. However, the editors still feel the need to account for the apparent lack of quality, since displayed prominently on the cover is the motto ‘Dedicated to the primacy of content over display’.

In so far as real readers take on the role of the imagined reader, authors of novels can, in effect, ensure that all of Grice’s maxims are met. If they do not – if they are boring, incredible, irrelevant or cryptic – they simply lose readers. For writers of functional texts (such as directories or manuals) the imagined reader cannot be regarded as a fiction in quite the same way, but must be seen as the range of possible actual users. In terms of Grice’s maxims, they cannot always be responsible for the *relevance* of information for each reader, nor for the appropriate *quantity*. They can, on the other hand, be held accountable for *quality*, and bear a large measure of responsibility for *manner*. In this context we can view typographically signalled access systems as the means by which non-fiction writers can cope with the requirements of relevance¹⁸⁷ and quantity while directing their text at a composite imagined reader.

Van Dijk’s relevance cues

Although he makes no overt reference to Grice, van Dijk (1979) has published a ‘tentative list’ of the cues through which readers may determine the relevance of a text or text component (Table 8.2) in which graphic factors are listed along with lexical, syntactic and semantic ones.

It is noticeable that this list includes a wider range of graphical cues than phonetic ones – in contrast to the conventional linguistic view, which is that graphic cues are a poor substitute for the richness of prosody and paralanguage. Van Dijk, of course, is concerned with the text rather than the sentence level, and his analysis suggests that at this level the position is reversed – that the graphic medium provides a richer repertoire of cues than the spoken.

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¹⁸⁷ Sperber & Wilson (1986) have built a broad theory of cognition and communication around the relevance maxim.

1. Graphical	Type size, boldness Italics, spaced, underlining, margin lines, boxes/frames, etc; Make-up, leads, heads, etc.; indentation; text ordering.
2. Phonetic/ phonological	Stress, pitch, volume, length, pause.
3. Paratextual	Gestures, facial expression.
4. Syntactical	Word order Cleft sentence structure Topicalization Paragraph and discourse ordering.
5. Lexical	Direct relevance expressions: <i>important, relevant, crucial</i> , etc. Theme indicators: <i>the subject/theme/... is</i> : Summarizers: <i>in brief/short, in other terms/words</i> , etc. Concluders: <i>the conclusion, result, etc. is; we conclude...</i> Connectives: <i>so, thus, hence</i> Superstructure signals: <i>our premises are, the conclusion is, it all happened in, suddenly...</i> Complex event names: <i>accident, vacation</i> , etc.
6. Semantic	Topic-comment function of sentences Contrastive/differential structures Thematic words and sentences (topical expressions) Summarizing or introducing sentences (topical) Paraphrase Repetition Presupposition and semantic ordering Descriptive level (relative completeness)
7. Pragmatic	Global illocutionary force indicating devices: <i>I (hereby) warn (ask, congratulate) you</i> ; particles, etc
8. Schematic/ superstructural	Global categorical ordering of the text
9. Stylistic	Specific variations on the other levels
10. Rhetorical	Rhetorical operations: parallelisms, repetitions, contrast, etc. (on all other levels)

Table 8.2 A tentative list of relevance signals in discourse (van Dijk 1979).

Van Dijk's analysis can be correlated to some degree with the present genre model, suggesting a possible harmonization of the function of graphic and other cues. He relates the cues in his list both to what he terms 'textual relevance' (the internal relations of parts of a text) and to 'contextual relevance' – why a particular topic or theme should be relevant to particular readers with particular purposes. Textual relevance is itself subdivided into local and global kinds. Since local relevance is mostly concerned with the sentence level, the graphic contribution would presumably be limited to the normal repertoire of punctuation marks, italicization and so on. Broader typographical cues would then relate mostly to global and contextual relevance, which we may see as roughly parallel to the distinction drawn

in the present study between topic and access structures. Van Dijk does not actually assign particular functions to the cues in his list, which could clearly be extended to include a richer view of typographic resources and access systems.

Van Dijk hints at a possible conflict between contextual and textual relevance. Although, on one hand, parts of the text will be deemed more or less relevant in relation to the reader's interests and purposes (contextual relevance),

‘yet language and communication conventions at the same time require that he will construct a picture of what was *intended* to be relevant by the speaker. This means that the reader will have to look for the “objective” [ie, textual] relevance cues in the text.’ (p. 123, author’s emphasis)

As a case in point, I find myself reading van Dijk’s paper in precisely this manner. I know from his other writings that he is not very interested in graphic matters, and that, although they are the main reason for my interest in his paper, they are probably only included for the sake of completeness. So as well as trying to relate his ideas to my own model, I have to be satisfied that I understand his intended message and have represented him fairly.

This reflects something of the tension in the genre model that arises from the difficulty in distinguishing between topic and access structures in practice. In a perfect world, it might be thought, the writer’s choice and sequence of topic would exactly match the reader’s requirements – such worlds, although far from perfect, do in fact exist in education and training.¹⁸⁸ Given the variety of prior knowledge, skills and purposes among less controlled audiences, though, we must distinguish between those access systems which map exactly onto the author’s topic structure, and those which, listed in some other rational but not text-dependent order, can be freely accessed by the reader. The first kind might include headings and the contents list; the second would include alphabetically arranged indexes and glossaries, and standardized keywords chosen from a list that is not specific to the text in question (ie, from a list applied uniformly across a database). Thus my reading of van Dijk’s paper, as an outsider relative to his discipline, would have been aided by a broader range of cues, some of which may not be traditional within the genre of ‘scientific paper’ – more headings, a glossary, perhaps an index, and tutorial explanations or critiques by others aimed at a multi-disciplinary audience. This difference in access structures reflects a distinction between two genres of scholarly

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188 Examinations are often set to test knowledge of a standard text, rather than of a subject area for which a range of texts might be available; a well known example is the part of the driving test where examinees are questioned about the *Highway code*. Trainees in subjects like nursing, the police, accountancy and law will be especially familiar with this kind of exam.

writing – the textbook, geared to students and those new to a discipline, and the academic paper, topic-oriented and addressed to experts.

Turn-taking

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In direct dialogue, relevance can obviously be negotiated between the participants. Another important consequence of the presence of both participants is that, for dialogue to take place, they need to agree to take turns. In the written context we can see that even the most self-organized of reading strategies (for example, of the book-shop browser) still involve periodic compliance with the writer's intended sequence. The sociologists' concept of turn-taking (Sacks, Schegloff & Jefferson 1974) recognizes that there is a limit to the degree to which conversations can be interactive and that most social settings and cultures embody rules for 'floor apportionment'. These rules may be tacitly observed, as in social gatherings, or even explicitly specified, where a chairperson allocates time to members of committees or assemblies.

Turn-taking suggests a possible interpretation of the different levels of chunking in verbal language: that each chunk represents a unit of the conversation between writer and reader, the interruption of which risks misunderstandings at a corresponding level of analysis. Thus, incomplete apprehension of a single word risks lexical error, of a sentence risks grammatical error, and of a paragraph risks an error of logic or argument. In discourse analysts' terms, graphic segments may represent 'transition relevance points'.

Most people would probably regard the chapter as the basic unit for turn-taking in reading – we expect to read it at one sitting – and authors may even give explicit instructions to certain categories of readers to skip chapters. Some textbooks, in fact, include elaborate charts that show teachers which chapters should be studied for courses of different duration. Charts such as those shown in Figure 8.2 are now a standard component of college textbooks in the competitive US market.

Whereas the textbook in which this chart appears expounds its subject within chapters in a traditional manner, others are expressly designed to be conversational in style and structure, even within chapters. Open University courses, for example, were originally conceived as 'tutorials in print' (Rowntree 1982) containing 'self-assessment questions' for students to monitor their progress. Textbooks such as these are based to a large extent on the work of educational psychologists who have exhaustively investigated the use of inserted questions (reviewed by Anderson & Biddle

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1975) – although question and answer sequences in the form of Socratic dialogues and catechisms are, of course, an ancient pedagogic technique.¹⁸⁹

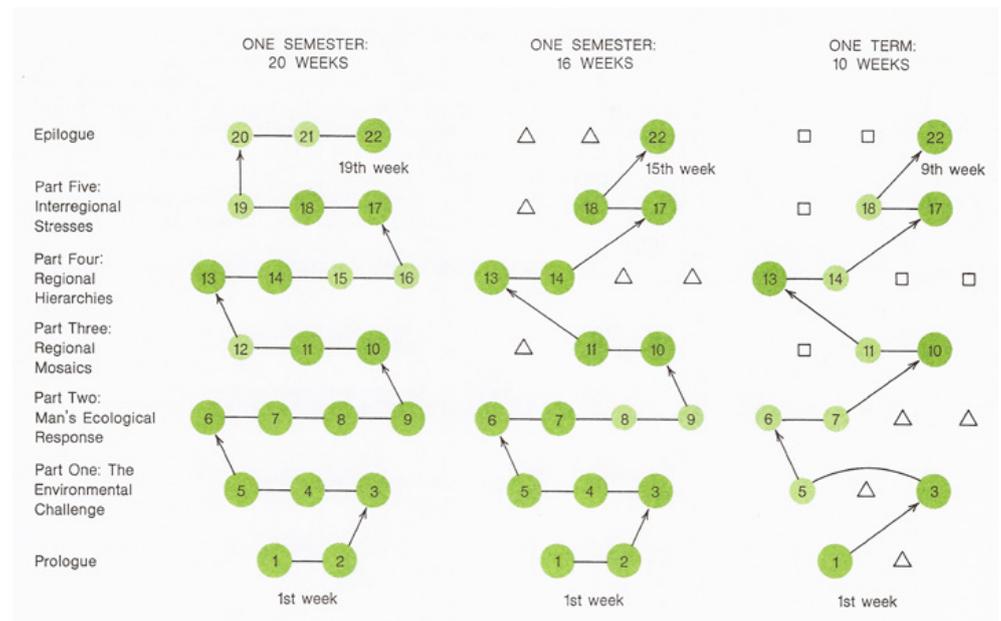


Figure 8.2 From P. Haggett, *Geography: a modern synthesis*, 2nd edition, London: Harper & Row, 1975).

Question and answer structures present typographers with what has become known as a ‘routing’ problem. Some recent case studies have been published in relation to question/answer sequences in textbooks (Waller 1984a) and the design of administrative forms (Waller 1984a; Frohlich 1986). Approaches range from radical alternatives to prose (Lewis, Horabin & Gane 1967, Wright & Reid 1973, Bhatia 1983), interactive computerized alternatives (Frohlich, 1986) to enhancements of conventional techniques (Cutts & Maher 1986; Department of Health & Social Security 1983; Waller 1984a).

But whereas textbooks and administrative forms employ explicit questioning techniques, some have suggested that *all* text can be seen in terms of an implicit dialogue between writer and reader. Coulthard (1985) concludes his book on spoken discourse with an invitation to consider the extent to which techniques for conversational analysis might apply to written text:

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¹⁸⁹ The original source of the steady stream of papers on inserted questions that appeared in the educational psychology literature of the 1970s was Rothkopf’s theory of ‘mathemagenic’ activity (Rothkopf 1970). The Greek roots of ‘mathema-genic’, a word coined by Rothkopf, suggest ‘giving birth to learning’ – his central claim is that it is not so much the structure of texts or curricula that determine effective learning as the activities and attitude of the learner. That is, the use of inserted questions was designed to encourage readers to engage in the learning task with a questioning mind; Rothkopf was able to show the use of questions improved the learning of all aspects of the text, not just the topics focused on by questions. The theory is no longer very fashionable, but could be reinterpreted as an attempt to encourage a conversational approach to learning. See also the critical review by Carver (1972) and reply by Rothkopf (1974).

‘As you close this book you might like to speculate on the function of full stops. Are they perhaps interaction points, places where the writer thinks the reader needs to stop and ask questions about the previous sentence, questions whose range I initially restrict by the structuring of my argument and which I subsequently answer in the next or later sentences.’ (Coulthard 1985: 192)

This is exactly the approach taken, independently, by Winter (1977)¹⁹⁰ and Gray (1977).¹⁹¹ Gray suggests that whereas dialogue consists of explicit questions and answers, monologue consists of answers that ‘contain’ (or imply) their questions:

‘Composition is “composition” by virtue of the fact that it “puts together” in subject-attribute assertions what in conversation is separated by the speakers – the raising of the questions and the rendering of the answers to them.’ (Gray 1977: 4)

A simple demonstration text used frequently by Winter and his colleagues may serve as an example: ‘I was on sentry duty. I saw the enemy approaching. I opened fire. I beat off the attack’. Hoey (1983) imputes the following questions to the imagined reader:

I was on sentry duty.	Situation
<i>What happened?</i>	
I saw the enemy approaching.	Problem
<i>What was your response?</i>	
I opened fire.	Solution
<i>What was the result of this?</i>	
I beat off the attack.	Result/Evaluation

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There is a potential difficulty here in identifying the particular questions posed by the imagined reader. For example the question in response to ‘I was on sentry duty’ might just as appropriately be ‘why?’ or ‘where?’. Gray’s answer would be that they are simply analytic devices:

‘each question is determined as much by the succeeding assertion as by the preceding one. The question...indicates the relationship *between* two assertions.’ (Gray 1977: 15)

Gray recommends the use of implied questions as part of what he terms a ‘generative rhetoric’ – a technique for composition in which writers can determine the direction of their argument by articulating (to themselves, not in their composition) the questions arising from preceding assertions.

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¹⁹⁰ An accessible account of Winter’s work has been published by Hoey (1983). It is possible that Hoey, a colleague of Coulthard at the University of Birmingham and warmly acknowledged in his preface, inspired the remarks just quoted.

¹⁹¹ Widdowson (1979: Chapter 13; 1980; 1984: Section 3) also takes the same view and uses the same technique of imputing questions to an imagined reader to explain relationships between assertions. His argument is not pursued as far as those of Winter and Gray, who construct quite elaborate grammars, but it is more completely integrated into the wider literature of pragmatics and cognitive psychology.

Whereas Gray does not have very much to say about overall patterns of implied questioning, Winter and his colleagues justify their implied questions by reference to the formulaic sequence (situation-problem-solution-result-evaluation) indicated in the example quoted above. They detect this pattern, with numerous variations and embedded sub-sequences, in samples of real prose. If there is a normal sequence, as they suggest, then readers presumably know what question to ‘ask’ by reference not only to the substance of the initial statement but to their tacit knowledge of the conversational pattern anticipated by the author within a particular type of document. Winter’s data tends to be drawn from popular science writing, hence the prominence of the problem-solution pattern in his analysis. Other document types, presumably, may reveal a fuller variety of dialogue patterns.

Two implications for typographers may be drawn from the conversational view of text. Firstly, it suggests that textual units may not always be linked in the systematic way that a focus on topic structures alone might suggest. Headings, for example, might have no relationship, hierarchical or otherwise, with each other but only with their immediately preceding and following text. Such headings give prominence to an implied question that requires special emphasis or that constitutes a major transitional point in an argument, but have little meaning to the browsing reader. Editors and typographers have to take special care to coordinate this local role of headings with their global role as part of a hierarchy – to ensure that headings make sense not only in their local context as transitional devices but also when collected together in a contents list.

Secondly, our attention has been drawn once more to the significance of genres or text types. Discourse analysts and ethnographers have drawn attention to the fact that the context of a conversation affects the relationship between participants and what is said.

In addition to the conversational maxims of Grice, a further influential strand of linguistic philosophy that sheds light on such relationships is the speech act theory of JL Austin. Austin (1962) drew an important distinction between what he termed the *constative* and the *performative* uses of language.¹⁹² Whereas the constative function refers to the use of language to make statements about the world, the performative function describes the use of language as an instrument for the completion of a task. The key to the difference lies in their evaluation: constatives such as ‘This thesis is written on white paper’ can aptly be called true or false, but a promise, a warning or a greeting cannot. To use one of Austin’s own examples, the

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¹⁹² The brief summary that follows cannot do justice to Austin’s theory, nor to the complexity of the debate that has ensued from it (reviewed by Levinson 1983). The intention is simply to illustrate the principle of instrumentality.

sentence ‘I name this ship the *Queen Elizabeth*’, as uttered when smashing the bottle against the stem, would not normally be called true or false. Instead, it would be deemed, in Austin’s terms, *felicitous* (if uttered on the right occasion by the person officially designated to do so) or *infelicitous* (for example, if uttered as a joke).

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Austin distinguished between three ways in which an utterance may be viewed. Considered as a *locutionary act* it is simply an act of speaking, say, a sentence (or writing one, although spoken examples are mostly used); considered as an *illocutionary act*, we must consider the act performed by the use of the sentence by virtue of the conventional or illocutionary force normally associated with it; for example, to say ‘I promise that...’ is to carry out the act of promising. Austin’s third category is the *perlocutionary act*, which describes the creation of an effect through an utterance; for example, embarrassing or annoying someone. The distinction between illocutionary and perlocutionary is somewhat technical, and is not relevant in this context. Austin’s theory is most often plundered for the concept of *illocutionary force* and this study shall be no exception.

Illocutionary force carries with it the notion of *felicity conditions*, which are the rules defining the valid use of utterances like ‘I name this ship...’ or ‘I pronounce thee man and wife’. Favourite examples of infelicitous speech acts include ‘baptizing a penguin’ and ‘ordaining a jar of anchovy paste’. Typography has its own equivalents to official ceremonies: bank notes, company seals and educational diplomas are only valuable if made and issued by authorized people, although an extensive rhetoric of value has been created around such objects – exploited notably by the advertising and packaging industries.¹⁹³ However, once we depart from ‘official’ acts such as the launching of ships or religious ceremonies the definition of ‘felicity conditions’ is problematic.

Eco (1981: 11) makes an interesting link between the notion of the imagined reader and speech acts:

‘the Model Reader is a textually established set of felicity conditions ...to be met in order to have a macro-speech act (such as a text is) fully actualized’.

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Each text, it is suggested, implicitly signals to whom it is addressed – who is the ‘legitimate’ reader, and who is cast in the role of observer or outsider. We may complement this with a similar link between conversational maxims and surface style is made by Gumperz (1982: 131):

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193 The current leaders in this are *Reader’s Digest*, from whom I have received phoney stock certificates, pay slips, and bank books. I have also received car registration documents (from Drive Publications) and computer punched cards (from *Which?*, who should know better). In a slightly surreal connection between the felicitous and infelicitous use of the rhetoric of value, a franking machine company sends real Bulgarian bank-notes to potential customers to symbolize the money they could save through their products.

‘this channelling of interpretation is effected by conversational implicatures based on *conventionalized co-occurrence expectations between content and surface style.*’
(my emphasis)

Large type and childish pictures suggest that children are being addressed: adults may choose such a book – as a gift for a child perhaps – and they may read it aloud to a child, or read it for some critical or evaluative purpose, but they do so as outsiders. This becomes very obvious when new newspapers are launched: their choice of format (broadsheet or tabloid), the size of their banner headlines, and the busyness of their pages signals their desired readership as much as anything they say.¹⁹⁴

Context

The role of typography in signalling the genre and illocutionary force of a text suggests an extension to Gray’s characterization of a written assertion as an answer containing its question. A written text, we might say, also *contains* its own context. (Although, bearing in mind the problems inherent in the container metaphor, noted earlier, it might be better to substitute ‘embodies’ or ‘implies’.)

This perception may help reconcile the conversational view of reading with Olson’s (1977) notion of the autonomy of text (Chapter 7). According to Olson, written text has the capability of preserving explicit meanings in a reliable context-free manner. Because language is freed from its interpersonal function, reason and logic come to the fore and readers can extract meaning directly from the self-sufficient text. The modern belief in the self-sufficiency, or autonomy, of text is attributed by Olson to Luther’s concept of scripture as its own interpreter. A major issue in the Reformation concerned the replacement of the Latin Bible, interpreted by the Church, with direct access to vernacular translations by ordinary people. The Protestant view of scriptural authority rests largely on the notion that the Bible is an autonomous text that contains meanings that can be understood adequately in cultures very different from the ones which produced it. The access devices discussed earlier can be seen as ways of enhancing this self-sufficiency by providing the answers to modern readers’ questions, unanticipated by the original authors. There is perhaps some irony in the debate within the non-denominational Bible Society¹⁹⁵ that surrounds the

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¹⁹⁴ Numerous articles in the *UK Press Gazette* indicate that layout is generally agreed to be crucial to the success of new launches (eg *Today*, *The Independent*, *News on Sunday*). The October 1986 issue of *Designer* also contains a number of articles on newspaper design matters occasioned by the transfer to electronic page make-up.

¹⁹⁵ A founding principle of the British & Foreign Bible Society (now called Bible Society – for some reason they omit the definite article) was to print the scriptures ‘without note or comment’. My remarks here are based on personal conversations with Bible Society staff during a discussion of their plans for various special editions of the Good News Bible in 1977. A brief defence of the commentary in that version can be found in Nida (1977).

provision of headings and summaries – although designed to aid self-study by ordinary readers, they inevitably reflect the priorities of their compiler.

Olson regards seventeenth-century British essayists, Locke in particular, as responsible for the archetypal autonomous text, citing also the Royal Society's perception of the link between plain language and clear thinking. Interestingly, Locke's own view of Bible layout is brought to our attention by McKenzie (1986). In his own commentary on the Epistles, Locke protests at their division into chapters and verses:

‘that not only the Common People take the Verses usually for distinct Aphorisms, but even Men of more advanc'd Knowledge in reading them, lose very much of the strength and force of the Coherence, and the Light that depends upon it’.¹⁹⁶

Locke's wish was realized in 1937 with the publication by Heinemann of *The Bible design to be read as literature* (described in Table 8.1), and almost all modern translations¹⁹⁷ follow suit, although marginal or superscript verse numbers are still provided for reference purposes. Since Locke's own *Essay concerning human understanding* is divided into chapters and numbered sections, he is presumably objecting not to all reference systems but only to those imposed on authors by others.

Olson's view has recently been disputed by Nystrand, Doyle & Himley (1986), who point out that formal speeches and lectures are as explicit as any written text, and that ‘public signs, kit instructions and notes left on refrigerator doors’¹⁹⁸ are examples of context-dependent writing.¹⁹⁹ They use Olson's own paper to demonstrate how almost any writing is context-bound – it is contextualized by its publication in the *Harvard Educational Review*, its date of publication, its introductory literature review and its accompaniment by an abstract, footnotes and references. We might add to their list Olson's affiliation to the Ontario Institute for Studies in Education.²⁰⁰ These editorial and typographic features allow us, a decade later, to place Olson's ideas into a context which, for us, includes material published since that time (for example, Nystrand's criticism).

Nystrand *et al* claim that Olson's article ‘functions not because it is independent of its context of use but because it is so carefully attuned to

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196 An Essay for the Understanding of St. Paul's Epistles. By Consulting St. Paul himself, 1707, quoted by McKenzie (1986: 46).

197 For example, *The Good News Bible*, and *The New International Version*. Hunt (1970) discusses similar features in the design of *The New English Bible*.

198 ‘Place-bound’ writing is discussed further by Harweg (1987).

199 Tannen (1982: 3) also disputes Olson's hypothesis. She suggests that it ‘indeed taps features often found in spoken and written discourse respectively, but these result not from the spoken or written nature of the discourse as such, but rather from the genres that have been selected for analysis – casual conversation, on one hand, and expository prose, on the other.’

200 It may or may not be significant that McLuhan, Havelock and Innis also worked in Toronto.

this context' (p 101). However, they seem to over-egg their pudding when they go on to claim that:

'it is difficult to think of many actual situations where writers do not know at least something substantial about their reader's expectations even if they cannot always know them personally.' (p 106)

The readership of the *Harvard Educational Review* is self-selecting to a large degree, but many texts cannot be aimed at specific audiences. The problem of determining the skills and needs of readers is widely recognized by those responsible for government information, technical literature and other widely-circulating non-fiction texts (as a number of the papers in Duffy & Waller, 1985, show). Moreover, the permanence of the written medium means that the author's assumptions about the original readers of a text might be mostly irrelevant at a later date, or in another place. Although, since the Epistles were one of the last parts of the Bible to be written, their co-text (the Old Testament and the Gospels) is probably as familiar to modern readers as those Paul was originally addressing, there is very little in common between the original audience of, say, the minor prophets and ourselves – we have little option but to risk Locke's scorn and use them out of context, if at all. One of the attractions of the typographically-distinct access systems described earlier is that they can be added at a later date without directly affecting the original author's composition.

Nystrand *et al* criticize Olson for making an unfair comparison between informal conversation and formal written exposition, but in fact he does recognize that, since texts lack a shared situational context, they must assign 'the information carried implicitly by nonlinguistic means [ie, in a conversation] into an enlarged set of explicit linguistic conventions' (Olson 1977: 272).²⁰¹ In other words, written exposition attempts to predict the implications²⁰² of what is said in order to deal with them explicitly. If we include in that 'enlarged set of explicit linguistic conventions' the typographic and editorial adjuncts that enable the text to answer a wider range of readers' questions than the author was able to anticipate, then perhaps there is no real quarrel between the autonomists and the conversationalists.

Widdowson (1984: 86) defines the achievement of accessibility as 'an alignment of different states of knowledge so that a common frame of reference is created'. He does not develop the concept in much detail, but it sounds similar to Nystrand's (1982) concept of shared semantic space

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201 The linguist Wallace Chafe, who has written extensively on oral and written language, has also commented that much of the paralinguage that accompanies speech is replaced by grammatical structures in writing (Chafe 1982).

202 It is not altogether clear whether by 'implications', Olson means logical entailments or the sort of conversational implications discussed by Grice. If he means the former, then his views cannot easily be reconciled with Nystrand's.

(introduced in Chapter 5). In conversation this is negotiated – terms can be defined, language simplified, theories exemplified, and objections met *on request*. In text this can be achieved partly by the special adjuncts that have been developed to help readers navigate around complex texts. But it seems we must define access structure in broader terms also. By establishing and signalling the context – the genre – of written communication, typography indicates its relevance and scope and the social relations of its participants.

It is clear that there is considerable overlap between my three structures in well-designed texts. Topic structures are not just fact structures but argument structures in which information is focussed, backgrounded, overlaid – staged, in fact, to use Grimes' (1975) term – according to the writer's conversation with the imagined reader. The argument and the conversation must be achieved, of course, within the confines of the stage – the artefact. In the concluding chapter I shall endeavour to pull together the three different strands of my argument and suggest that typographic genres, containing implicit (and occasionally explicit) genre rules, are an important key to an integrated and natural textual communication.

9

Genre structure

The model of typographic communication proposed in Chapter 5 suggested that actual texts reflect three underlying structural imperatives, each corresponding to one part of the writer-text-reader relationship. The analysis of pages from *The handbook of sailing* demonstrated some of its assumptions about the needs of reader, the communicational intention of the writer and the way that the technology of printing is used. That analysis might reasonably be generalized to other instances of the genre ‘home reference manual’ (the term used by its publisher). Other genres differ because of their different combination of topic, artefact and access structures: genres as different as posters, brochures, textbooks, journals, conference programmes or bus tickets could be analysed in a similar way.

In this concluding chapter I shall explore the concept of genre as a contribution to typographic criticism and training, although, for reasons that should become clear, I do not attempt a comprehensive classification of genres. Indeed, de Beaugrande (1980: 196) introduces his discussion of the related concept of ‘text types’ with the warning that they are best left as ‘fuzzy classifications’:

‘Unduly stringent criteria, like the rigorous borderline between sentences and non-sentences, can either (1) open up endless disputes over the admissibility of unusual or creative texts to a type, or (2) lead to so many detailed types that any gains in heuristic usefulness are lost.’²⁰³

Genres in literature

Genre is an ancient literary concept that, like so much else, goes back to Aristotle (the *Poetics*). In that context, Conley (1979) has sounded a similar warning:

‘If the history of ancient rhetoric teaches us anything, it is that the degree to which a discipline or method atrophies or declines is directly proportional to the complexity of the taxonomies it generates.’ (p. 52–3)²⁰⁴

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203 A similar comment is made by Graesser & Goodman (1985: 114) about the analysis of text structures: ‘Many representational systems are so complex that they have alienated virtually all researchers except for the one who invented the theory’

204 In view of current interest in the ‘generic coding’ of documents for electronic publishing, these are warnings that should be taken seriously. While I have not managed to find evidence that the concept of genre has been seriously addressed by those developing such systems, any classification scheme that

Although in the present context we are interested primarily in genres, or varieties, of typography, it seems that there are substantial connections between typographic and literary forms. The most thorough theoretical treatment of literary genres is by the Canadian critic Northrop Frye (1957), whose account of the origin of genres makes an interesting reference to what I have called artefact structure – the means by which text is delivered to its addressees:

‘The origin of the words drama, epic and lyric suggests that the central principle of genre is simple enough. The basis for generic distinctions in literature appears to be the radical of presentation. Words may be acted in front of a spectator; they may be spoken in front of a listener; they may be sung or chanted...The basis of generic criticism in any case is rhetorical, in the sense that the genre is determined by the conditions established between the poet and his public.’ (Frye 1957: 246–7)

Such technical aspects of the artefact are still an important determinant of the normal literary use of the term ‘genre’ at the broadest level. In particular the writing-system rules employed by a writer – rules concerning the status of the line, in particular – determine whether a work will be received as a poem or a novel. Hawkes (1977: 137) comments:

‘the two distinctive *genres* of language in its written form, poetry and prose, emit *iconic* messages about their nature through the visual means of typography over and above (or under and beneath) the *symbolic* messages of their content.’

However, Hawkes moves immediately to an example that complicates this simple distinction between poetry and prose. He ‘quotes’ a passage from *Ulysses*²⁰⁵ where Joyce switches from what we might term novel-prose to newspaper-prose, complete with a bold centred headline. (It is a moot point to what extent one can ‘quote’ typography without actually reproducing it in facsimile²⁰⁶ – his version differs typographically from my own copy of *Ulysses*, which itself almost certainly differs from earlier editions.) Even in the literary context, then, it seems that a wider range of typographically-distinct genres – wider than just poetry and prose – must be recognized.

Brewer (1985: 189), comparing oral and written story-telling traditions, regards the printing press as largely responsible for the extensive divergence of genres in literate societies:

‘Many oral narratives appear to be carrying out a wide range of functions at the same time. Thus, a single oral narrative may be doing what Western literature would do through a novel, a dirty joke, a history text, a scientific journal article, a religious text and a philosophical essay...Literacy, the printing press, and

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claimed to identify the characteristics of all types of document would undoubtedly be received with great interest.

205 Hawkes gives the reference as pp.107–108, but does not say which edition. The relevant passage, which is headed ‘IN THE HEART OF THE HIBERNIAN METROPOLIS’ appears on page 118 of the 1971 Penguin edition. The headlines continue for a number of pages.

206 In my own experience, even when one submits facsimile illustrations of typography, publishers are sometimes tempted to treat them as quotations and reset them.

specialization of function in Western society have allowed the development of highly specialized genres. Along with the specialization of discourse force (e.g., to inform, or to entertain, or to persuade) has gone specialization of discourse form.’

Whereas these authors (Frye, Hawkes and Brewer) use the concept of genre to link the way texts are produced with their rhetorical intention, Miller (1984) has moved the emphasis further toward the writer-reader relationship. She suggests that although Frye links genre with situation, his actual criticism is still based on formal characteristics of language: ‘For [him], situation serves primarily to locate a genre; it does not contribute to its character as rhetorical action’ (p. 153). Her definition of genre as ‘social action’ implies that ‘a rhetorically sound definition of genre must be centered not on the substance or the form of discourse but on the action it is used to accomplish’ (p. 151).

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Werlich’s theory of text types

Werlich (1976), whose text grammar places the analysis of genre in a central position, also regards typography as a significant marker of what he terms ‘text type’. He establishes a hierarchy of what are effectively genres, although he does not use that term. Werlich’s work does not appear to be widely cited (in the English language literature, at least), but since, firstly, it is an unusually thorough treatment of text types, and, secondly, he is particularly sensitive to the role of typography, it deserves attention in the present context.

At the highest level of Werlich’s scheme is *text type*, of which there are five kinds: *description*, *narration*, *exposition*, *argumentation* and *instruction*. The first three of these stem from the topic of the text – spatial, temporal and systematic relations between concepts; the last two seem to be related more to the need to effect a change in the addressee (to persuade or instruct). De Beaugrande (1980) uses almost identical categories:²⁰⁷ *descriptive*, *narrative*, *argumentative*, *scientific* (ie, exposition), *didactic* (ie, instruction); he adds *literary* and *poetic*. However, having recognized these categories, de Beaugrande goes on to refer to such things as advertisements, newspapers and recipes, without making it clear which text types they correspond to.

Werlich overcomes this problem by making a further distinction between *text groups* (fictional and non-fictional) and *text forms*, variants of which correspond rather more closely to ordinary language categories such as those mentioned by de Beaugrande. I have already noted Werlich’s relatively faithful reproduction of the typography of his examples (Chapter 1), and he evidently regards typography as a particularly important

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²⁰⁷ Both Werlich and de Beaugrande probably draw their categories from German text linguistics, where, to judge from their citations, there seems to be a long tradition of text classification. In particular, both cite work by Güllich & Raible (eg, 1972).

determinant of the addressee's critical stance. Depending whether the text is fictional or non-fictional, the reader must connect textual references to people, places or events – either to real phenomena or only to the text's internal frame of reference. According to Werlich:

‘Non-fictional texts (e.g. news stories, reports, comments, regulations, etc.) are marked by signals (e.g. types of title and headline, including references to the text form, and dates, place-names, kind of publication, typography, layout)...’ (p. 42)

He uses an almost identical formulation when he comes to discuss ‘fictional texts (e.g. short stories, novels, sonnets, plays)’ (p. 43).

Text forms, in Werlich's scheme, are rather broad categories that correspond to his five text types, but which are broken down into further sub-categories: argumentative text forms, for example, include *comment* and *scientific argumentation*. Text forms are often realized in practice as *text form variants* which are ‘composed in accordance with a conventionally fixed *compositional plan* (e.g. the *leading article* and the *review* are variants of the *comment*)’ (p. 46). His examples of fictional and non-fictional texts would thus appear to be text form variants.

Werlich's scheme appears to offer an attractive theoretical framework which assigns a linguistic role to typography (although not a role which is defined in any detail) and copes with typographically distinct text form variants such as advertisements, newspapers and so on. His detailed descriptions of examples are perceptive and draw on a wide range of linguistic concepts. However, the rather dogmatic classification into five text types is not very satisfactory when actual texts are examined. It is not clear, for example, whether a particular text is expected to fall into only one category – it is not hard to find a single prose passage containing a combination of, say, narration, description and exposition. Werlich does at one point recognize that his text types are ideal structures which might be combined in practice, but his selection of examples gives the opposite impression. A further problem is that many texts employ one apparent structure in order to achieve another covert goal. Advertisements, in particular, are placed awkwardly into the category of instruction; most do indeed try to influence behaviour, but often indirectly. And many advertisements require no direct action of the reader but are published for general public relations purposes; they might better be classed as exposition or argumentation. Werlich is therefore vulnerable when he suggests a single compositional plan for advertisements:

- (1) headline (with an optional *subhead* and an optional *illustration*)
- (2) body copy
- (3) signature line’ (p. 126)

The five text types stem from Werlich's notion of the 'cognitive matrix of the communicant's mind' in which he identifies five corresponding kinds of cognitive perception (of time, space, etc). The communicant (or writer) is thus assigned the dominant role in Werlich's communication model; indeed, he presents a diagram of the encoding-decoding variety discussed in Chapter 5. While the 'cognitive matrix' adds an apparent theoretical depth to his scheme, it results in the practical difficulties just noted. De Beaugrande, by way of contrast, makes very little of his text type definitions, which he tosses in as something that 'might prove useful for further research' (p. 197). He repeats the warning, quoted earlier, that they are 'fuzzy sets of texts among which there will be mutual overlap'.²⁰⁸

Genres as ordinary-language categories

By treating genres (text form variants, in Werlich's terms) as basic categories, we may avoid the intellectual gymnastics that result from Werlich's attempt to apply cognitive categories, which apply to individuals, to texts, which are social phenomena. Ordinary-language genre labels are generated in response to real needs felt by communities of text producers and users; they thus have an empirical, perhaps an evolutionary, basis as social realities.

This is precisely the view of the 'ordinary language philosophers', whose founding figure, JL Austin, justified it thus:

'Our common stock of words embodies all the distinctions men have found worth making, in the lifetimes of many generations: these surely are likely to be more numerous, more sound, since they have stood up to the long test of the survival of the fittest, and more subtle, at least in all ordinary and reasonably practical matters, than any you or I are likely to think up in our arm-chairs of an afternoon – the most favoured alternative method.' (Austin 1961: 182)

Among professional philosophers there seems to be considerable scepticism about Austin's faith in the survival of the fittest (Graham 1977), but his ideas are widely cited by linguists and others interested in language and communication.

Journalism can supply a simple example of the evolution of new descriptive terms to fit everyday linguistic categories. While book editors are usually content to see headings in terms of simple hierarchies (chapter heading, sub-heading, sub-sub-heading; or A heading, B heading, C heading), journalists have coined words that reflect the way headings are used in newspapers: some terms are based on the location of headings (skyliner,

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208 It is also interesting to note that de Beaugrande defines text type in a similar manner to the model of genres presented here, although referring to a different set of underlying structures: 'A text type is a distinctive configuration of relational dominances obtaining between or among elements of: (1) the surface text; (2) the textual world; (3) stored knowledge patterns; and (4) a situation of occurrence' (de Beaugrande 1980: 197).

double-decker), others on their purpose (kicker, screamer, teaser). Journalism textbooks such as Evans (1974) usually supply their own variations on such terminology.

The ordinary-language status of typographic genres may also contribute to the quest for the extension of literacy to include typographical factors. Within their own cultures, readers can develop a tacit knowledge of genres, even if they do not initially have the explicit technical knowledge needed to produce accurate examples themselves. In contrast, specialist linguistic or psychological terminology fits awkwardly into the context of typographic training – theoretical concepts like ‘schema’ and ‘macrostructure’ are hard to understand, and especially hard to apply to practical tasks, even by experts.

On the other hand, their ordinary-language status means that descriptions of genres reflect the full complexity of human interaction rather than the symmetry of a theoretical model. It also means that new genres are constantly being developed as topic, artefact and access structures change, or new combinations are required. Genres are therefore easier to instantiate than classify – easier to recognize in retrospect than to specify in advance. The study of ordinary-language or ‘de facto’ genres, as they are termed by Miller (1984), is essentially ethnomethodological; in her words, ‘it seeks to explicate the knowledge that practice creates’ (p. 155). New genres are probably recognised, and therefore named, by specialists before they percolate through to ordinary language use.

A further note of relativism and fuzziness is added when we recognize, firstly, that actual texts may belong to more than one genre, and, secondly, may contain components that belong to different genres. These problems were recognized by the sociologist Dell Hymes (1972, 1974) whose application of the concept of genre to spoken discourse has been influential among discourse analysts (cf Brown & Yule 1983, Coulthard 1985). He tackles the first problem by distinguishing between a genre and its performance, suggesting the use of the term ‘speech act’ to denote the latter. Actual speech acts need not necessarily fall neatly into a single genre category. He deals with the second problem by recognizing different levels of genres: *elementary* or *minimal genres* which in practice may be typically found grouped together into *complex genres*. Thus a religious service might constitute a complex genre, consisting of elementary genres such as hymns, prayers, sermon and so on. Speech acts are instances of elementary genres, and Hymes uses the term *speech event* to describe instances of complex genres.

Although Basso (1974) suggests the application of Hymes’ approach to written communication, he is vague about the details. Certain problems might be anticipated (indeed, Coulthard, 1985, has noted problems with

Hymes' system in relation to its intended context of spoken discourse). Although it is reasonable enough to see speech acts and events as hierarchical, it is hard to know where to stop. Hymes only suggests two levels, but we have to decide whether to add further ones. A church service might itself be a sub-component of a larger event – a feast-day, for example, which might, further, be part of Lent or some other sub-section of the church year.

Rather than propose a detailed hierarchy of genres in parallel to a hierarchy of speech acts (or text acts, documents or whatever equivalent term one might choose), it would seem more realistic to recognize that any class of objects – not only linguistic ones – can be seen in terms of genres, kinds, types or varieties, and that judgement about genre membership cannot be restricted to a single dimension. That is, we need not expect to find an exactly parallel relationship between categories of abstract entities (genres) and categories of real objects (texts). Campbell & Jamieson (1979) distinguish between a *generic perspective* and 'a crusading search to find genres'. They remark that

'The generic perspective recognizes that while there may be few clearly distinguishable genres, all rhetoric is influenced by prior rhetoric, all rhetorical acts resemble other rhetorical acts.' (p. 26)

Genre markers and genre rules

Genres are proposed as a basis for typographic conventions because, as ordinary language categories, they are intuitively and holistically understood. But although I have proposed a model in which they are accounted for by three underlying sources of structure, each corresponding to an aspect of the writer-text-reader relationship, these are abstract categories that are not usually immediately apparent from looking at a typographic display.

In practice, it is more likely that genres are recognized by their more obvious and typical physical characteristics. These might be described or grouped in a number of ways. A full list might be as comprehensive as van Dijk's list of relevance cues (Chapter 8), but concentrating on the most readily apparent graphic features we might organize the typical features of typographic genres into four simple categories:

1. *Typical context of use*: situations (industrial, domestic, educational, bureaucratic etc); products (books, periodicals, objects, packs and containers etc); in the case of historical examples, date of origination.
2. *Typical format and configuration*: page (or field) size and shape, binding (where appropriate), paper or other surface material, frequency and use of colour, grid, boundary (line, box, column, page, book, container etc);

extrinsic information structures (Twyman 1982) might be included under this heading

3. *Typical treatment of verbal language*: composition system (letter fit, image quality, etc), typographic style (atmosphere, associations), range of signalling (underlining, bold, italic, etc), additional features (rules, tints, borders, etc); intrinsic information structures (Twyman 1982) would be placed here.

4. *Typical treatment of visual elements*: pictorial syntax or style,²⁰⁹ proportion of visual to verbal language, how visual and verbal language are integrated.

	Instructions for domestic appliance	Holiday brochure	Traffic sign
<i>1. Typical context of use</i>	Delivered with product	In travel agencies or sent by post	On posts or scaffolds near roads.
<i>2. Typical format and configuration</i>	Size may be restricted by container size; usually one or two colours; major division by language; minor division by operational task. Short examples may be on single sheets or concertina-folded, longer ones stitched.	Mostly A4 to fit standard racks and envelopes. Some slimmer for timetable racks. Bright colour; cheap shiny paper; Mostly saddle-stitched; short ones may be concertina-folded; long ones may have square backs	Standard shapes; metal or backlit plastic; standard colours; Multiple signs stacked vertically.
<i>3. Typical treatment of verbal language</i>	Sans-serif type, multi-column grid; blocked paragraphs; tables for technical info.; boxed or bold sections for warnings etc.	Display type may have special atmosphere; tables, boxes etc; small print at back; booking form on back page.	Standard Dept of Transport bold sans-serif type (upper & lower case)
<i>4. Typical treatment of visual language</i>	Schematized diagram of product with parts identified on diagram; in multi-lingual examples, diagram folds out with parts identified by numbers: separate keys for each language.	Colour photographs; some of hotels, some symbolic of destination (Eiffel tower, etc); May include drawings and decorative or atmospheric illustrations. Hotel illustrations are closely integrated with relevant prose and tabular info.	Heavy use of arrows & standard symbols, often used unaccompanied by words. Symbols & maps refer to immediate environment.

Table 9.1 Typical surface features of some typographic genres

Table 9.1 illustrates how three particular genres might embody typical combinations of such graphic features. Figures 9.1–9.3 illustrate some examples. In attempting even this limited exercise it becomes clear that one must discriminate between those features which a text must have to qualify for membership of a particular genre, and those features which are completely irrelevant to genre. But as well as such *essential* and *accidental*

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²⁰⁹ Ashwin (1979) has addressed the problem of characterizing illustrative style.

features, we may identify an intermediate category of *typical* features. For example, an *essential* feature of a match-box label is that it is small enough to fit on a match-box. It is also essential that it is actually on a match-box (or, properly captioned, in a collection or illustrated book). It will display *typical* formulations such as ‘Safety matches’, ‘Made in Sweden’ or ‘approx. contents 50’, but other visual and verbal elements will be mostly *accidental* (as far as genre assignment is concerned).

2014 editorial note:
new examples have been used
for Figures 9.1-9.3

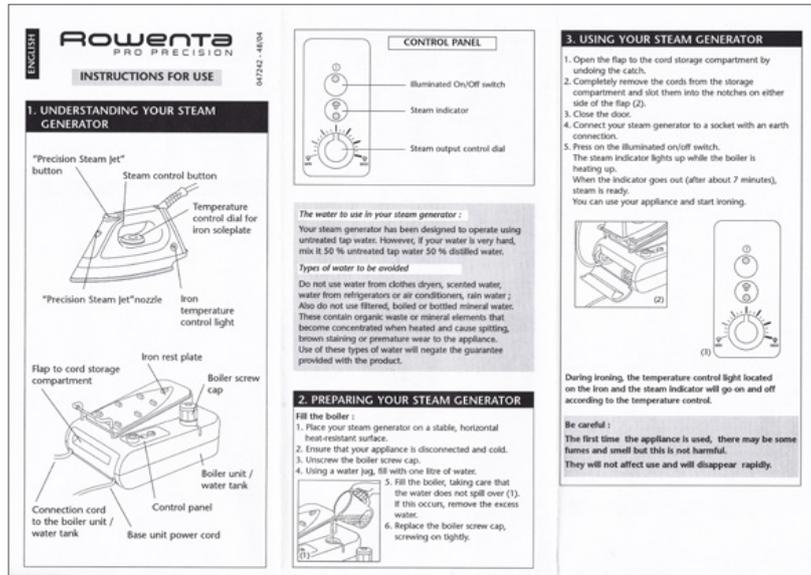


Figure 9.1 Typical instruction leaflet for a domestic product.



Figure 9.2 Typical travel brochure

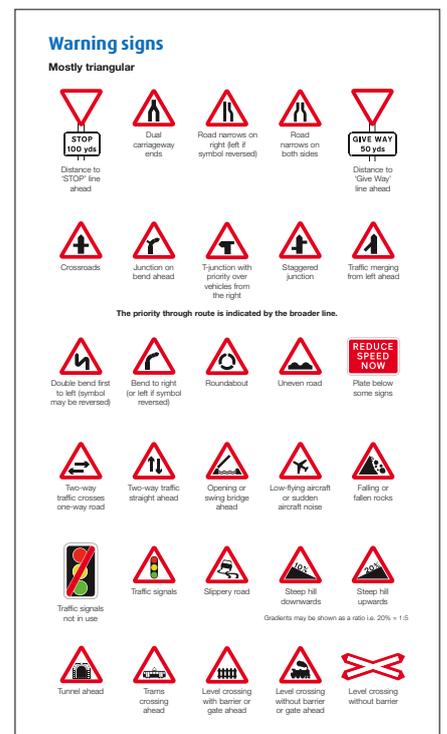


Figure 9.3 Road traffic signs from the UK Highway Code.

Those genres with a high proportion of essential features are obviously more coherent, more easily recognized and more strictly rule-bound than those with few such features. The traffic signs considered in Table 9.1 must obviously be unambiguous for reasons of safety and law enforcement – not only ambiguous in their meaning but also in their genre, since drivers need to distinguish them from a host of competing visual information. Bank-notes are another kind of ‘text’ in which every graphic detail, including the paper, is rule-bound, while various other kinds of documents contain just some parts which are circumscribed by law – credit agreements, legal documents and company registration documents, for example. These may be contrasted with other genres which, although identifiable, are only similar by virtue of typical features. The other two examples in Table 9.1 exhibit no purely graphic features which are essential (although the A4 format of the travel brochures is consistent, it is shared by too many other genres to be a primary recognition feature). It is because most genres are similarly identified by clusters of typical features – which may be constantly changing as new fashions and innovations are absorbed – that any general classification scheme must remain fuzzy and tentative.

It is, of course, possible – in fact, common – for otherwise fuzzy genres to be regulated in particular contexts, if not with the force of law then through institutional rules or authoritative recommendation – house styles, for example. Other genres may be similarly articulated, but retrospectively rather than prescriptively – although newspaper design has been described in some detail, few journalists would treat such descriptions as instructions. Other genres still – the more avant-garde magazines, perhaps – may be similarly stereotyped but as yet unarticulated. Table 9.2 suggests a tentative structure for these varying degrees of rule-boundedness.

	<i>Basis of genre membership</i>	<i>Examples</i>	<i>Where the 'rules' are articulated</i>
<p><i>Similar because highly rule-bound</i></p>  <p><i>Similar but not explicitly rule-bound</i></p>	Legally enforced	Certain aspects of credit agreements, traffic signs, product labelling, etc	Legislation
	Institutionally enforced	Scientific journals	APA style (and similar)
		Technical manuals	Military contracts ²¹⁰
	Recommended by authorities	Book publishing	Butcher (1975), Williamson (1966)
	Ritualized but loosely articulated	Letter-writing	Etiquette manuals (Walker 1983) ²¹¹
		Newspapers/magazines	Evans (1973; 1974), Sellers (1968)
Stereotyped through intertextual reference and imitation	Advertising, style and fashion magazines	Criticism (Thomson & Davenport 1980), Semiological analysis (Barthes 1977)	
Similar only through coincidence of constraints	Amateur advertisements on office notice-board	Similar examples analysed by Walker (1983)	

Table 9.2 Some typographic genres on a 'scale of rule-boundedness'. Note that instances of the genres at all points on the scale exhibit similarity to one another – there is no implication that genres at the top of the scale are closer-knit than those lower down. The table simply aims to describe the extent to which similarities among members of a genre can be attributed to explicit rules.

Table 9.2 is meant to focus attention on the relative rigidity of various kinds of genre conventions, rather than the classification of particular genres. On a closer look it becomes clear that different aspects of the same genre may be rule-bound to different degrees and in different ways. Certain advertisements have to conform to legal requirements (in particular, cigarette and political advertising), they voluntarily conform to recommended standards (although it is not clear whether 'legal, decent, honest and truthful' applies to graphic aspects of advertisements), they

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²¹⁰ It is usual for military contracts to include a specification for the technical manual that is to accompany the equipment to be supplied. The specification may include details of format, illustration and typography. Kern (1985) discusses technical manuals for the US armed forces and provides numerous references to sources of procedures and standards.

²¹¹ Letter-writing formats are institutionally enforced by school examinations. My wife, who is a teacher of English, tells me that students must remember to use different conventions for each exam – many students take both 'O' level and CSE English.

are likely conform to stereotypes,²¹² and they may share the same practical constraints.

Genre rules and error detection

In cases of less well articulated genres, the identification of underlying ‘rules’ or slots (or, at least, the basis for similarity) can be something of a problem. The Danish linguist Hjelmslev (1959) suggested a *commutation test*. If the substitution of an element of a text significantly changes the meaning of the whole then it is clearly essential not accidental. This notion is taken up by Barthes (1964/67: 65) as a means of detecting semiological codes in imagery, and Eco (1976) similarly refuses to accept that an unsegmented work of art is ‘a magic spell that is radically impermeable to all semiotic approach.’ He explains the commutation test thus:

‘If one changes one contextual element, all the others lose their primitive function and are usually unable to acquire another; they remain unbalanced, as on a chessboard where a bishop has been replaced by a third castle. If there is such *contextual solidarity*, then there must be a *systematic rule*.’ (p. 271)

The commutation test deliberately tries to introduce ‘error’ into a text in order to tease out the underlying relationship of its elements. Some artistic works use what are effectively commutation tests when they challenge the conventions of their medium – painters may extend the image beyond the frame, composers may employ noises made by objects other than musical instruments and writers may invent new words.

A published example of a typographic commutation test may be found in Jones (1976), who demonstrates Stanley Morison’s appropriate use of typographic ornament by printing samples of Garamond and Baskerville type with contemporary and non-contemporary decoration (Figure 9.4).

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212 Variations of the concept of stereotype – schemata (Gombrich 1960) and ‘cultural codes’ (Barthes 1967, 1977) – were discussed in Chapter 3 as ways of attributing systematicity to analogue images.



NOTICE
to
THE READER

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The square Italian variety of type, with its slab serifs, was succeeded by that known to us as “old face.” The former letter was wrought to perfection by craftsmen of Venice, a city which long enjoyed the primacy of typographical honour. The perfected types of the brothers da Spira, and of Nicolas Jenson (1492), were widely copied, as was the italic later brought out by Aldus (1501). The more, as in respect to type, lay-out, format, paper



A NOTE

ON THE BASKERVILLE TYPE

THIS new “Monotype” face is a faithful reproduction of an historic type designed by John Baskerville, the Birmingham ex-footman and writing master, who was born in 1706. His interest in typography dates from 1750, and during twenty-five years he printed and published a large number of editions of English, Latin and Greek classics in octavo and quarto, and one or two folios which by reason of the fineness of paper (he was one of the first if not the first, to use wove) and type employed exerted a tremendous influence upon English and foreign typography.



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Figure 9.4 The top row is correct. From Jones (1976: 40).

Although it is more usual to speak of error ‘analysis’ (cf Lewis 1981), the resulting imbalance envisaged by Eco provokes a judgement that is more synthetic than analytic. It is a holistic or aesthetic apprehension of error that may only be expressed as puzzlement or dislike; its converse – a problem well solved – may be represented by feelings of pleasure, triumph and balance. For all their inability to articulate the problem (until it is solved and order is restored, at least), the aesthetic judgement relied upon by most designers, although termed ‘irrational’ by some, can have real validity in the hands of skilled typographers (although the questions still remain: how can such skilled performers be identified? how can this skill be passed on to others?).

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Whereas semiologists thus appeal to error detection as a means of revealing underlying codes, in terms of the model presented in this study, such contextual (or genre) imbalance may be seen as a failure to reconcile the requirements of topic, artefact and access structures.

Since topic, artefact and access structures represent participants in the communication process (and recalling Miller's [1984] definition of genre as social action), it is interesting to note that the *Shorter Oxford English Dictionary's* definition of 'solecism' links the grammatical and social notions of error. While the major definition is 'using incorrect syntax', a further definition refers to 'a breach or violation of good manners or etiquette'. The converse of this idiomatic recognition that manners are a 'grammar' of social behaviour is that grammar is a matter of good manners – considerateness – towards the reader. 'Considerateness' has in fact been suggested as the main criterion for good textbook design by some educational researchers (Jones *et al* 1984; Anderson & Armbruster 1985). This criterion also calls to mind Otto Neurath's vision of the transformer²¹³ as the 'trustee of the public'.

Genre and design method

Although the model presented in Chapter 5 proposes that conventional or genre structures represent the holistic configuration of the three basic structures (topic, artefact and access), the relationship is not purely hierarchical. Because genres are stereotyped and conventional, they may take on a life of their own and provide a rival source of design constraints – a fourth structure to be considered in parallel to the others.

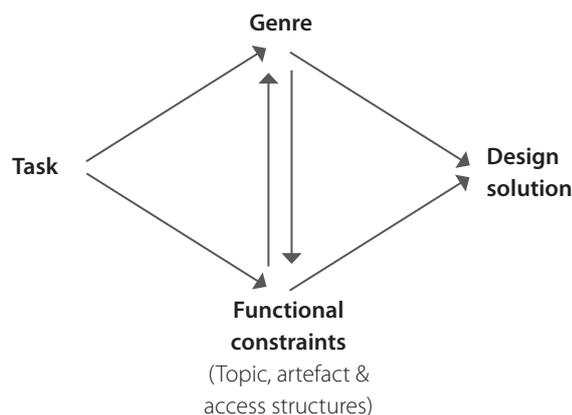


Figure 9.5 An ideal relationship between genre conventions and functional constraints, in which they are considered in parallel before fixing on a design solution.

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213 'Transformer' describes a role developed by the Isotype Institute as an intermediary between subject-matter specialists (who may lack graphic skills) and graphic artists (who may lack statistical expertise). The transformer is a communication expert acting on behalf of the audience. Twyman (1975) describes the original concept, and a modern application of the idea to instructional design was proposed by Macdonald-Ross & Waller (1976).

The practical working of this relationship may be better expressed in terms of a simple diagram of the design process. In Figure 9.5, the design process is represented as the linking of a design task and a design solution through the four structures of the present model. Topic, artefact and access structures are here conflated under the term ‘functional constraints’, for economy of expression.

Although an ideal situation might be represented by a careful coordination of genre and functional constraints, by identifying four distinct routes from problem to solution we may tease out some aspects of the role of genres in design method. These are shown in Figures 9.6–9.9.

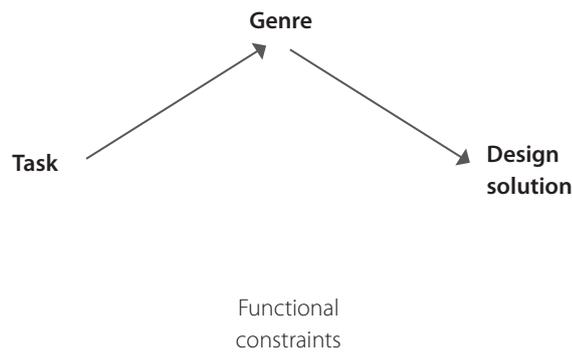


Figure 9.6

Figure 9.6 represents a design method totally reliant on genre, in which a conventional solution is proposed instinctively, and possibly correctly, but never tested against an analysis of the relevant functional constraints. In effect, the functional constraints analysis can only be achieved in such cases through feedback from users – something that may be inconvenient and expensive to obtain. In practice, it is unlikely to be a priority in situations where so little attention has been paid to the design process in the first instance. In any case, unless related to a functional analysis, it may not be possible to use feedback to make detailed modifications, although cumulative and overwhelming negative feedback may lead to a radical redesign – which, if still uninformed by a functional approach, may simply result in a new set of problems.

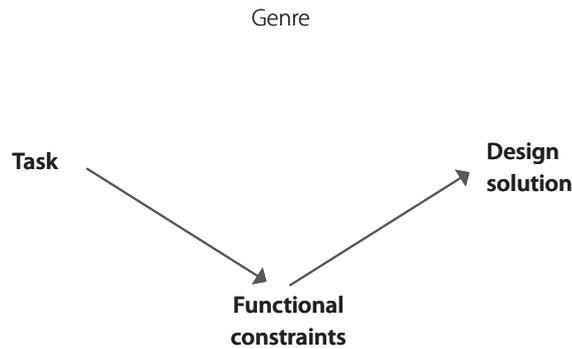


Figure 9.7

The converse of design solely by genre is diagrammed in Figure 9.7. Here an apparently sound and carefully researched technical solution is found, but, since it lacks the characteristics of a recognized convention, readers may not know what sort of style, strategy or critical stance is appropriate. They may take some time to deduce the ‘rules of the game’. In certain unusual or innovatory situations, this may actually be the only option – but readers are likely to need special help. Genre-free technical solutions may in time lead to the development of new conventional structures – for example, the extremely ‘unfriendly’ user interface to the CP/M operating system for personal computers became well enough known by users for the writers of the rival MSDOS system to imitate it.

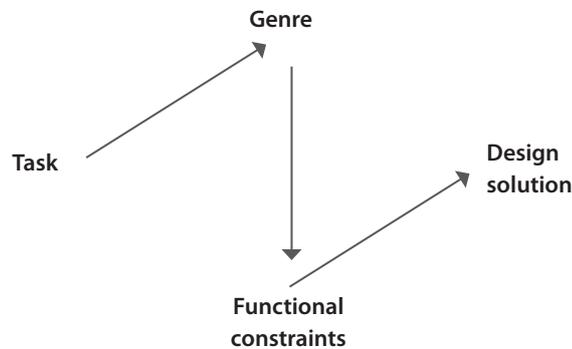


Figure 9.8

The next two alternative routes represent rather healthier design methods in which functional and genre considerations are considered in parallel. Figure 9.8 represents the reaching of a solution intuitively by identifying the appropriate genre; the solution is then validated against the functional constraints. This cycle of design and criticism was discussed in relation to typographic research by Macdonald-Ross & Waller (1976).

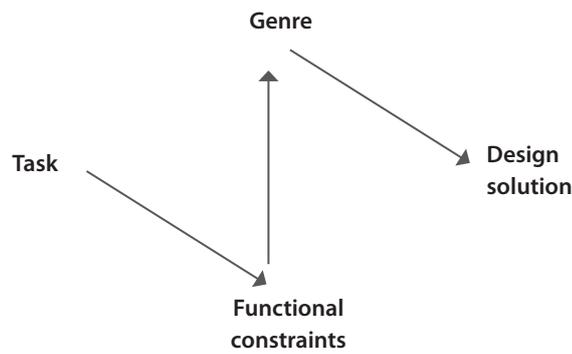


Figure 9.9

In Figure 9.9 the critical cycle goes the other way: a solution achieved through an analysis of functional constraints is then checked against genre-related expectations that might be anticipated among readers. In practice, the critical cycle may often be informal and evolutionary – small modifications being introduced in subsequent editions of a particular text, and minor functional improvements becoming incorporated into other instance of the genre.

Conclusion

Reading the products of typography's neighbouring disciplines, it is possible to gain an impression of typography as a distant cousin whose existence is recognized on certain special occasions, but who is not really part of the interdisciplinary family of discourse studies whose core members are linguistics, sociology, psychology and literary studies. Yet there is a sense, too, in which typography may be something of a missing link whose recognition may be long overdue. Although there seems to be a consensus that situational context is a vital consideration in any theoretical treatment of discourse, with very few exceptions (Bernhardt, 1985, is a notable one) the typographic contribution to that context is ignored, poorly understood or simply pointed to but not investigated further.

A recurring theme in studies of communication and discourse is the contrast between spoken and written language, conversation and prose, or oral and literate culture, characterized by Olson's (1980) distinction between *archival* (topic-oriented, autonomous) and *communicational* (audience-oriented, context-bound) forms of language. But although extended prose argument is claimed to replace the mnemonic archival techniques of oral cultures, the requirements of quick access via headings, classification schemes, and regular spatial arrangements suggest close parallels between the requirements of memory in oral cultures and typographic access in literate ones that suffer from information overload. Typographic systems, like oral ones, emphasize rhythms, parallelisms, schematizations and similarly unsubtle but visible (and therefore usable) structures. For

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example, pages (such as the one shown in Figure 7.6) consisting of evenly shaped paragraphs reflect the need for all lines to contain the correct number of syllables in verse forms. The practical need served is not memory but clear topicalization (Chapter 6) and accessibility (Chapter 8).

In recent years there has been something of a revival in the fortunes of the word ‘rhetoric’ which for many years had, and for some still has, pejorative overtones of flowery or demagogic language.²¹⁴ Rhetoric has many affinities with typographic design – it can be superficial, merely decorative and insincere, or it can represent the marshalling of practical techniques of clear communication. Indeed, a number of teachers of graphic design have applied rhetorical ideas to their subject (Bonsiepe 1965; Ehses 1984. Kinross 1986 also discusses the application of rhetoric to graphic design, but from a less committed standpoint).

Ehses concentrates largely on the use of rhetorical figures in the design of posters. However, his selection of that part of rhetoric that has to do with persuasion, and its application to posters – a persuasive medium – may just serve to reinforce old prejudices about the superficiality of graphic design and does not suggest how the rehabilitated rhetoric might be applied to typography. Ehses’ rhetoric, as he explains, is an application of just one part of what was originally a five-part system in classical rhetoric – *elocutio*, or style. Leaving aside the two minor stages, *memoria* (memory) and *pronunciato* (delivery), the three main stages were *inventio* (invention), *dispositio* (arrangement) and *elocutio* (style) (the translated terms are from Dixon, 1971).

The story of twentieth-century typographic theory might be seen as some sort of a progression through these stages. Starting with a limited conception of typography as the simple recording and delivery to the reader of words (*memoria* and *pronunciato*), through a growing awareness of the stylistic and associative properties of type (*elocutio*, exemplified by Bruce Rogers’ theatrical metaphor), and the Modern Typographers’ use of type to display the structure of text (*dispositio*), we reach the opportunity afforded by electronic publishing to incorporate typography into the process of writing (*inventio*).

Whatever basis is used to incorporate typography into discourse studies, it is important that it does not become as technical as linguistics, semiology, and even rhetoric, with their multifarious abstract categories. A highly specialized theoretical system may satisfy scholarly criteria but it is unlikely to succeed in the practical context, where, as was noted in Chapter 2, simple guidelines and slogan language are generally better welcomed than

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²¹⁴ Dixon (1971) gives a good account of the history of rhetoric, and attitudes to it; accounts of recent thinking on rhetoric may be found in EE White (1980) and, with particular reference to genre criticism, in Campbell & Jamieson (1979).

theoretical constructs which few will make the effort to understand. It is hoped that, by treating ordinary language genres as real categories, some of these problems can be met halfway. Tacit familiarity with genres can be taught in the traditional manner of design education – through imitation, pastiche and criticism – but a more controlled and explicit understanding may also be reached by analysing genres into their three underlying structures – or some alternative system that others might propose.

Eco (1976) cites an illuminating analogy used by Lotman (1969):

‘Adults are usually introduced to an unknown language by means of rules; they receive a set of units along with their combinatorial laws and they learn to combine these units in order to speak; a child, on the other hand, is trained through constant exposure to a continual textual performance of pre-fabricated strings of that language, and he is expected to absorb his competence even though not completely conscious of the underlying rules.’ (Eco 1976: 138)

The trend in modern foreign-language teaching is to merge these two approaches. Even for adults, conversational practice is displacing grammatical rules. Textual genres might be taught similarly – by exposure to a continuous textual performance. This calls to mind Körner’s (1970) description of common-sense classifications – for that is what everyday terms such as ‘brochure’, ‘manual’, or ‘magazine’ are – as resting on ‘similarities of objects to standard examples and to standard counterexamples’ (see Chapter 2).

Typographers and graphic designers do indeed learn their trade by such a method – by apprenticeship rather than formal teaching. But, applying the analogy of language teaching, many could do with some basic rules and strategies to accompany their conversational practice. Recalling Partridge’s analogy of logic as king and grammar as Parliament, it might be suggested that genre rules relate to rhetorical and linguistic rules in the way that Anglo-Saxon common law relates to the Napoleonic code: they rely largely on precedent, rather than prescribing the range of legal possibilities.

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2020 Supplementary bibliography

The issues addressed in this thesis have been picked up by scholars in the field of multimodality. The following sources are a good starting point, and some of them cite this thesis.

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