

Sue Walker ¹

An approach to describing the design of children's reading and information books

Uma abordagem para a descrição do design de livros de leitura e informação para crianças

Keywords: typography [for children], theory of typography, graphic genre

This paper describes an approach to description of book design. It is part of a project that aims to develop an approach to description for identifying typical visual characteristics of children's reading and information books from 1830 to 1960 in order to identify different or innovative approaches to design, and to identify changes over time. It proposes description of design elements at macro and micro levels under 'document structure and articulation of content', 'typography', and 'material attributes'. In resulting descriptions it is proposed that these elements should be discussed in relation to the context of use that affects the design decisions that are made.

Palavras chaves: tipografia [para crianças], teoria da tipografia, gênero gráfico

Este artigo apresenta uma abordagem de descrição para o design de livros. Constitui parte de um projeto, cujo objetivo é desenvolver uma abordagem de descrição para identificar características visuais típicas em livros de leitura e informação para crianças no período de 1830 a 1960, de forma a identificar abordagens diferenciadas e inovadoras de design e identificar modificações ao longo do tempo. Ele propõe a descrição de elementos de design nos níveis macro e micro no que concerne a 'estrutura do documento e articulação do conteúdo', 'tipografia' e 'atributos materiais'. Nas descrições resultantes, propõe-se que esses elementos deveriam ser discutidos em relação ao contexto de uso que afeta as decisões de design.

The visual characteristics of children's reading and information books can be described in a number of ways. The approach here takes as a starting point that these kinds of books represent a particular publishing genre, and that their visual characteristics are influenced by the context of use and production, and related issues that those involved in producing a children's reading or information book would have had to consider. Depending on when a book is produced, decisions taken about design and production may have been made by printers, publishers, authors, designers, typographers or illustrators. Such decisions are likely to have been influenced by the technology they are working with, by their knowledge of the readers they are producing books for and about how they are likely to use the books, by the kind of content that they are dealing with, and by their awareness of the typical characteristics of the particular kind of book they are producing.

1. Describing book design

The approach taken here was developed during an Arts and Humanities Research Board-funded project 'Typographic design for children' between 1999 and 2001. This project aimed to review the typographic and layout characteristics of children's reading books dating from around 1830 until 1960. A second AHRB-funded study began in 2002: this extended the work of the first project to include children's information books from the same period, and to cover additional typographic issues in reading books.

The project team needed a systematic approach to recording data that would help to identify both typical visual characteristics of reading and information books from a particular period, and different or innovative approaches in design; and to plot changes in design over periods of time. The description focused on features relevant to document structure and articulation of

¹ The University of Reading, Reino Unido

content, to typography at micro and macro levels of organization, and with the material qualities of the books. The kinds of questions under each of these headings were as follows:

document structure and articulation of content

- *When did the double-page spread start to be used as an ‘information unit’ in textbooks?*
- *How are pictures and text used – does one mode dominate the other?*
- *When did colour begin to be widely used in young children’s reading and information books?*
- *How was colour used? What functions did it fulfil (in illustrations and in text)?*

typography

- *When did bold types start to be used for distinguishing key words in text?*
- *How widespread was the use of sans serif type in reading books?*
- *When did infant characters begin to widely used in children’s readers?*

material qualities

- *How was the book bound?*
- *Was there a typical or standard size used for primers or readers?*
- *What was the printing process used for text and for illustrations?*

Other issues related to the context in which design decisions were made. For example, the actual or perceived needs of the readers and the constraints imposed by the circumstances of use may have influenced decisions about typeface and type size, the content of the information and the way the books are intended to be used form part of an exploration of the functions of text and pictures, and consideration of the technology used (eg for typesetting and reproduction) is essential in discussion of the relationship between visual characteristics and production methods. In addition, the publishing and educational environment may have influenced editorial or design decisions.

Table 1 summarises book design elements under ‘document structure and articulation of content’, and ‘typography’, though there is considerable interaction between them. A third row heading ‘material attributes’ introduces the physical properties of the books. In resulting descriptions of visual characteristics the sets of features are considered in relation to factors relevant to context of use such as those listed in the last row of the table.

Table 1: Book design elements and features relevant to description

	Features relevant to description (at both macro and micro levels)
<i>Document structure and articulation of content</i>	<ul style="list-style-type: none"> – Navigation systems (contents pages, indexes, headings etc.) – Configuration (to include linear structure: continuous text, list, tabular format); use of page grids – Rhetorical devices (relationships/hierarchy between component parts) – Kinds of content in relation to ‘information unit’ (eg book, double-page spread) to include verbal, pictorial and schematic elements
<i>Typography</i>	<ul style="list-style-type: none"> – Letterforms and their articulation (eg use of space, colour, italic, bold, size)
<i>Material attributes</i>	<ul style="list-style-type: none"> – Size, format, kind of binding, paper kind and colour, printing process
<i>Context of use</i>	<ul style="list-style-type: none"> – Methods of teaching reading – Educational directives – Legibility research – Typeface manufacture and development – Publishing practices

This approach takes account of other work in the broad area of 'typography and language'. Some of this is summarized as part of a broader discussion of describing graphic aspects of language in Walker (2001). In particular, Waller's work on reader-focused notions of accessibility and structure in relation to graphic genre demonstrates the value of approaching documents on a number of levels (see Waller, 1987a, 1987b, 1991). His work was developed further by the GeM project and this is reflected in our consideration of 'macro-structural' elements (see Delin, Bateman and Allen, 2002). The GeM Project, for example, identifies the following levels of structure: content (the structure of the information to be communicated); rhetorical (the rhetorical relationships between content elements; and how the content is argued); layout (the nature, appearance and position of communicative elements on the page); navigation (the ways the intended mode(s) of consumption of the document is/are supported); and linguistic (the structure of the language used to realise the layout elements). Each of these levels is placed within the context of the following sets of constraints that have to be taken into account: canvas (those arising out of the physical nature of the object being produced, such as paper or screen size); production (those imposed by the technology used); and consumption (those arising from the needs of the user and circumstances of use).

The application of this descriptive approach is demonstrated in narrative accounts of the linguistic and graphic structure of spreads from bird books (see Allen, Bateman and Delin, 1999). Twyman's 'Schema for the study of graphic language' provides a tool for describing structures of graphic language (Twyman, 1979). Elsewhere he notes that choice of mode and configuration is just one of the elements that designers have to take account in their work (Twyman, 1982). He lists production method, the user, the circumstances of use and information content as further constraints. Norrish (1987) in her work on the graphic translatability of text was concerned with identifying the structural components of documents (the artifact itself, the main information content, and any supporting information, such as notes).

2. Approaches to data collection

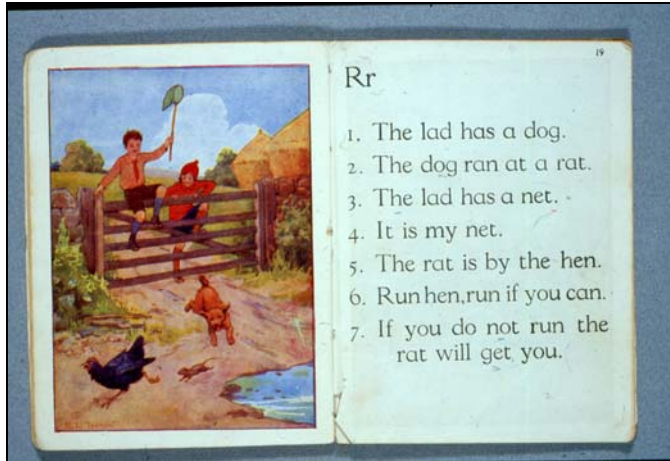
Two approaches were used for collecting information about the design of reading and information books in our corpus: a database to record particular features and their attributes; and case studies to explore particular issues, or characteristics of books from particular periods.

2.1. Database

A Filemaker Pro database was designed to record the features likely to be relevant to our description of the design of information books. For example, for the study of children's reading books detailed numerical information about type size and line feed was combined with data noting the presence or absence of a particular feature (such as infant characters). Figure 1 shows a double-page spread from a reading book published around 1920. The features of this that are relevant to description of its design features include:

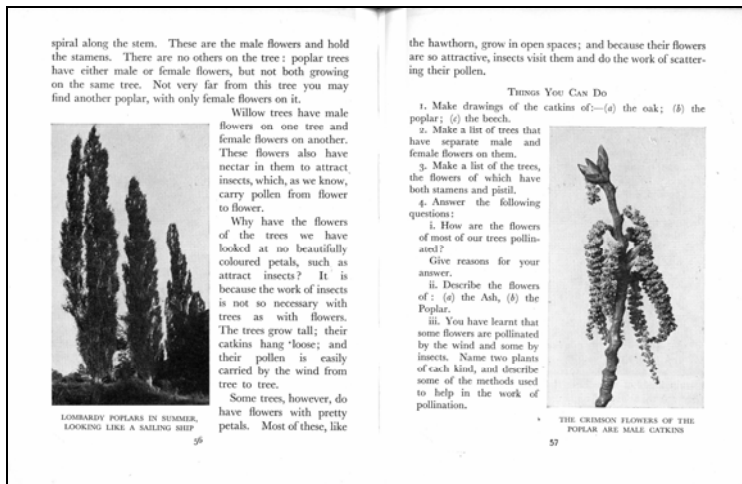
- *typeface;*
- *the use of infant characters;*
- *amount of horizontal and vertical spacing;*
- *treatment of heading;*
- *picture/text relationship.*

Figure 1: Double-page spread from **The songs the letters sing. A preparatory primer**. London and Glasgow: The Grant Educational Company Ltd, nd, c.1919, pp.18–19



This is an early example of the use of single storey 'a's and g's in a series of reading books for young children. The typeface bears similarities to several of the new 'old style' types that were issued from 1910 onwards by foundries such as Haddon, Stevens, and Shanks & Co, and is set in a large size with a generous amount of space between the lines. The very short heading (Rr) is set in the same typeface as the text, but in a larger size. The full-colour, full-page picture on the left-hand page relates closely to the story being told on the facing page.

Figure 2: Double-page spread from D. Williams and W. Campbell, *Easy lessons in nature study*. London: Oxford University Press, 1939, pp. 56–7



This spread is typical of those from other information books from the 1930s. It is black and white throughout and used squared-up halftones for illustrations. These pictures do not relate directly to the text within the spread. Large amounts of continuous text predominate with the use of lists and sub-lists in the 'Things you can do' section. The overall appearance of the spread suggests formality: headings and captions are centred and are in capitals, and the text is justified.

Figure 2 shows typical characteristics of information books from the 1930s. Issues relevant to articulation of structure and content are:

- *use of colour*
- *picture type*
- *treatment of captions*
- *text configurations*
- *picture/text relationships*
- *navigation features.*

Once collected, the data was used in a number of ways, first to note the presence and/or attributes of particular graphic features. A similar approach has been used in a description of the visual organization of handwritten and typed correspondence (Walker, 2001). It involves recording

the frequency of particular attributes over a period of time, or within a particular 'set' of books and is helpful in answering 'how many' and 'when' questions, such as:

- *How widespread was the use of sans serif type in reading books produced in the 1930s?*
- *When did the double-page spread start to be used as an 'information unit' in textbooks?*
- *When did colour start to be used for secondary text material in textbooks?*
- *How many books in the sample have more than three levels of headings?*

The data was also used to identify the typographic attributes used to fulfil particular functions within a text. In information texts, for example, bold, italic, change of typeface, use of letter spacing and increase in size may all be used to draw attention to particular words in text.

The data was also used to explore change and variation. The work with children's readers concentrated on three particular aspects: type size (which is considered to be particularly relevant to children's reading), and the related features of horizontal space and the treatment of the line.

Another focus is the use of serif and sans serif types, and infant characters across a sample of reading books from 1830 to 1960. One level of analysis recorded simply whether the type used for the bulk of the text had serifs or not, and whether infant characters were used or not. This information enabled a simple classification of books in the corpus showing use of:

- *serif types for text*
- *sans serif types for text*
- *serif type and infant character*
- *sans serif type and infant characters*

It showed, for example, that very few sans serif types were used before around 1940, but by the late 1950s sans serif types were the norm, that there were early uses of infant characters in the nineteenth century, but they were not widespread until the 1940s when they were frequently used with sans serif type. This rather coarse-grained approach gives an overview of development of typeface use in this period.

It also identified each instance of sans serif type use (or infant characters), and then led to a more detailed description such as the typeface used, and the foundry that issued it.

One of the benefits of capturing information in database format is that it allows inter-relationships of features and their attributes to be plotted. In the study of children's information books, for example, the ways in which headings are used to structure texts – in terms of the number of levels of heading was explored, and also the kinds of typographic differentiation that were used. For each information unit the presence of headings of Levels 1, 2, 3 and/or 4 was noted; and their form of distinction from the main text (capital letters, bold, italic, space above and/or below, underlining, colour etc). This allowed identification within our sample of, for example, the number and distribution of level 1 headings that are set all in capitals, and so on.

Description of content and structure combined information taken from the database with a more detailed analysis of these features in particular categories of book. The sections of the database particularly relevant to content and structure are:

- *extra matter*
- *navigation*
- *information units and the main graphic components within them*
- *image attributes*

Extra matter

Following Norrish (1987) the analysis of content distinguished between 'body matter' and 'extra matter'. Body matter was taken to mean the main information content of the artefact, and extra matter all the other kinds of information that may appear before or after the body matter. The extra matter in a children's reading book, for example, might include a frontispiece, title page, contents page, acknowledgements, publishers' advertisements; in an information book the list might extend to include a list of references, index, glossary and list of illustrations. As Norrish reports, it is not difficult to assign matter in this way: 'The main information content normally has a visual cohesion which reflects its semantic cohesion, whereas the extra matter is usually made up of small, discrete semantic units which have different functions in relation to the artefact as a whole . . .' (Norrish, 1987, pp.10–11). In design terms, too, this approach reflects the way that books are designed – the 'main content' is often designed before the material around it.

Navigation

Waller (1987a) identifies two kinds of navigation tools or access devices: 'global' which help to make sense of the structure of a document as a whole, and 'local' which guide readers around parts of a text and help to establish hierarchy and structure. Contents pages, indexes and lists of illustrations are global access devices, and headings and key words are local access devices. The project database captures presence or absence of a contents page, an index, page numbers, folio numbers, heading level 1, heading level 2, heading level 3, key words, and graphic devices (used here to mean devices such as arrows, pointing fist), and their visual treatment.

Information units

The way the content of the books is organized into broad structural units (sections, chapters, double-page spreads, single pages), and what constitutes this content in graphic terms (primary text, secondary text, headings, pictures, pictures with labels, captions to pictures, exercise) was also recorded. The purpose of this was to give a broad overview of what might be termed complexity of graphic organization, and the extent to which pictures (of one type or another) were used.

Picture/text relationship and image attributes

Picture/text relationship is just one dimension of pictorial language. Twyman's account (1985) of the dimensions of the problem of using pictorial language highlights many of the issues relevant to the project. In particular he suggests that graphic language is considered in relation to an operational framework that relates to the kinds of contextual factors (circumstances of use, means of production etc) discussed at the beginning of this paper.

In any situation where graphic language is used, other factors, most of them non-graphic, have also to be taken into account (Twyman, 1985, p. 248).

Picture-text relationship records the location of pictures in relation to the text by categorising under the broad classification of 'integrated' or 'non-integrated'. In an integrated text the text has been written to directly refer to the pictures. The data collected recorded whether the picture/text relationship is integrated or non-integrated and the location of the pictures in relation to the text that refers to them. This section also records information about pictures, such as the type of image (pictorial or schematic) and its treatment (squared up, vignettted, cut away etc).

The parts of images distinguished by colour were recorded as was the function the use of colour fulfils (articulation of structure, content or decoration), whether many or few colours are used, and whether the colours used are realistic or not.

2.2. Using case studies

One set of questions was concerned with document structure and articulation of content in books from a particular period of time, or printed by a particular publisher. At one level of description it was important to separate the structural elements from their typographic realization so that the range of ways that similar elements of structure were articulated typographically could be discussed.

One case study, for example, is reading books produced towards the end of the nineteenth century that were designed to fit in with UK government legislation in the form of the Revised Code which was operative in England from 1864 until 1904. This resulted in fairly tight prescriptions for the content and structure of books. For example, it was recommended that each lesson for children in the infant classes was contained within two pages, and that it should contain a passage for reading, a word exercise and a writing exercise. (Books in public elementary schools, 1928, p. 11)

The *Queen infant reader*, published around 1870, is one example of this kind of book. It is typical of many late-nineteenth century readers; it has 96 pages and is bound in red cloth-covered boards printed in black. According to its contents page it contains 'prose lessons', 'poetry', and 'drill exercises in vowel sounds', but though the book does contain these elements, this categorisation does not reflect either the sequence of material through the book or the precise contents of each section. More detailed looking reveals more: 'letters of a script alphabet', lists of 'primer words', list of 'new words in this book' and a page each of additions and subtractions. The bulk of the book, however, is made up of short sections, for the most part two pages long and usually presented as a double-page spread. Each section typically contains a picture, a title in capital letters, body of text broken down into numbered paragraphs, a listing of new words, a word exercise and a handwriting specimen. The study of Revised Code Readers shows that most follow closely this structural organisation, and because there is a variety of ways in which the component parts have been

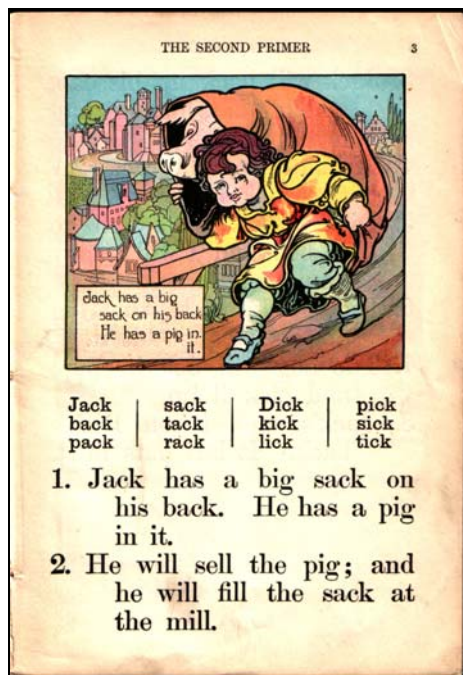
articulated typographically.

After identifying content in structural terms some issues were studied in more detail. For example, in most Revised Code infant primers and readers a picture is used to illustrate a lesson, and the next stage of our analysis was to describe in more detail the range of attributes of such pictures. We were concerned with describing the image type; the picture text relationship, both locational (usually above the text that it refers to) and the extent to which the content of the text is reflected in the picture; the way colour may be used in the picture to denote a particular function; with the use of colour in an organisational or meaningful way; and with the extent to which readers are encouraged to engage with pictures (through captions, embedded text, questions and answers and so on). Table 2 records the attributes of the pictures used to illustrate a lesson in two popular Revised Code schemes (see figure 3).

Table 2: Attributes of pictures used in two case studies

	<i>The Queen infant reader</i> [1888]	'Macmillan's New Literary Readers' <i>The second primer</i> , (1895)
image attributes	detailed, shaded drawings, simple line drawings, some squared up, some vignetted, a few cut out (black and white wood-engravings)	detailed, shaded drawings, squared up, chromotypography in yellow, pink, blue, black, red
picture-text relationship	same page/spread above text some pictures relate more closely to the text than others	above text pictures illustrate part of the text that follows pictures contain embedded captions
use of colour	black and white throughout	illustrations are coloured

Figure 3: Page from Macmillan's New Literary Readers. **The second primer**. London: Macmillan and Co, Limited.



A page from a Revised Code Reader published by Macmillan. The embedded caption can be seen as an attempt to further engage young readers with the text.

3. Contextual factors

There are few extant sources of objective, systematic information about the design characteristics of publications over time, and the Typographic Design for Children project has developed the skeleton of a descriptive method that could be applied to any corpus of published

material. It is not until this information is available that many of the questions listed at the beginning of this paper – what factors influenced design decisions – can be answered. For this work on children's reading and information books the following topics are relevant:

- **developments in education policy that have influenced the visual appearance of readers and textbooks.** For example, the Hadow Report of 1928 (*Books in public elementary schools*. London: HMSO), as well as surveying practice from around 1810, gives recommendations for the 'general appearance' of school books about type, and kind and use of illustrations.
- **legibility and vision research.** There was considerable activity in this area at the beginning of the twentieth century (see Venezky, 1984). The work of Huey (1908), for example, was very influential and contributed to the findings of the Report on the influence of schoolbooks upon eyesight which was produced by the British Association for the Advancement of Science in 1913.
- **methods of teaching reading.** The main methods were 'phonic' and 'whole word' and a variety of typographic conventions were used in explanations of these (see, for example, summaries of these methods in Morris, 1984).
- **typeface development and manufacture.** For example, part of Monotype's marketing strategy in the 1920s was to work collaboratively with the publisher Ginn to promote typefaces for school books (see Morss, 1935; Warde, 1950).
- **publishing practices.** For example, publishers of reading books at the end of the nineteenth century were fiercely competitive about their particular version of a series of readers that conformed to the Revised Code – the ways that they described the books in their advertising provides an indication of those features of visual appearance that they thought important.

Consideration of such issues helps to build up a picture of the context in which such books were designed and used, and can be central to effective designing – in particular that which aims to be user focused. Including such issues in an analytical framework means that any resulting description of visual characteristics is not based solely on subjective interpretation.

This short paper presents work in progress. It outlines the development of an approach to describing the visual characteristics of a particular kind of graphic language. Within the context of the Typographic Design for Children Project it has provided data that contributes to an overview of the development of the typographic and pictorial characteristics in reading and information books produced for children.

References

- Allen, P., Bateman, J., and Delin, J. (1999). *Genre and layout design in multimodal documents: towards an empirical account*. American Association for Artificial Intelligence Fall Symposium on Using Layout for the Generation, Analysis, or Retrieval of Documents, Cape Cod, Autumn 1999.
- British Association for the Advancement of Science. (1913). *Report of the influence of school-books upon eyesight*. London: Murray
- Delin, J., Bateman, J. and Allen, P. (2002). A model of genre in document layout. *Information Design Journal*, vol. 11, no.1, pp.54–66
- Huey, E. H. (1908). *The psychology and pedagogy of reading*. New York: Macmillan
- Morris, J.M. (1984). *Phonics: from an unsophisticated past to a linguistics-informed future*. In G. Brooks and A. K. Pugh *Studies in the history of reading*. Reading: UKRA
- Morss, R.D. (1935). *The neglected schoolbook*. *Monotype Recorder*, 34, 3–13
- Norrish, P. (1987). *The graphic translatability of text*. *British Library R&D report 5854*. Reading: Department of Typography & Graphic Communication, The University of Reading
- Twyman, M. (1979). A schema for the study of graphic language. In P.A. Kolers, M.E. Wrolstad and H. Bouma (eds) *Processing of visible language 1*. New York: Plenum Press, 117–50
- Twyman, M. (1982). *The graphic presentation of language*. *Information Design Journal*, 3/1, 2–22

- Twyman, M. (1985). *Using pictorial language: a discussion of the dimensions of the problem*. In T.M. Duffy and R. Waller *Designing usable texts*. London: Academic Press, pp.245–312
- Venezky, R. L. (1984). *The history of reading research*. In D.P. Pearson, R. Barr, M.L. Kamil, and P. Mosenthal (eds). *Handbook of reading research, vol I*. New York and London: Longman, pp. 3–38
- Walker, S. (2001). *Typography and language in everyday life*. Harlow: Pearson Education
- Waller, R. (1987a). *The design of print media*. Milton Keynes: The Open University
- Waller, R. (1987b). *The typographic contribution to language*. Unpublished PhD thesis, Department of Typography & Graphic Communication, The University of Reading
- Waller, R. (1991). *Typography and discourse*. In R. Barr, M. Kamil, P. Rosenthal, and P.D. Pearson (eds). *Handbook of reading research, vol II*. New York and London: Longman, pp. 341–80
- Warde, B. (1950). *Improving the compulsory book*. *The Penrose Annual*, vol. 44, pp. 37–40

About the author

Sue Walker is a lecturer and researcher of the Department of Typography & Graphic Communication, The University of Reading, UK since 1980 and has been Head of Department since 1997. Within the University, she is Head of the School of Arts and Communication Design where Typography & Graphic Communication is joined by Fine Art, and Film, Theatre and Television. She is currently co-editor of *Information Design Journal + Document Design*, editor of *Paradigm* (the journal of the Textbook Colloquium), and a member of the editorial advisory panel of the Brazilian Journal of Information Design. She is also a member of the Executive of the Design Education Association (DEED), a council member of the Design Research Society (DRS) and a member of the Arts & Humanities Research Council (AHRC) Peer Review College.

sf.walker@reading.ac.uk