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SUE WALKER

DESCRIBING THE DESIGN OF CHILDREN'S BOOKS: AN ANALYTICAL APPROACH

SUE WALKER is Professor of Typography at the University of Reading where she has served as Head of the Department of Typography & Graphic Communication and Dean of the Faculty of Arts and Humanities. She is also a Fellow of the Design Research Society. Her recent research has focused on the design of children's reading and information books, and on the work of the Otto and Marie Neurath and Isotype Institute as one of the directors of the funded 'Isotype re-visited' project.

ABSTRACT

Descriptions of graphic language are relatively rare compared to descriptions of spoken language. This paper presents an analytical approach to studying the visual attributes and conventions in children's reading and information books. The approach comprises development of a checklist to record 'features' of visual organization, such as those relevant to typography and layout, illustration and the material qualities of the books, and consideration of the contextual factors that influence the ways that features have been organized or treated. The contextual factors particularly relevant to children's reading include educational policy, legibility and vision research and typeface development and availability.

The approach to analysis and description is illustrated with examples of children's reading and information books from the Typographic Design for Children database, which also demonstrates an application of the checklist approach.

THIS PAPER PRESENTS AN ANALYTICAL APPROACH

to studying the visual attributes and conventions in young children's reading and information books in order to understand why particular design and production decisions might have been made.

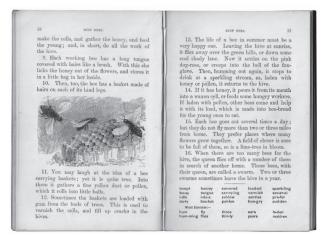
A recurring theme in information books for children has been the life and work of the honey bee, and examples from the 1890s to the 1980s show the different ways text and pictures have been used to tell this story. Each of the spreads illustrated in Figures 1-4 contains a number of graphic components or 'features': text, pictures, headings, captions. These are treated differently through, for example, typeface, spacing, position on the page, use of color. The different treatment of such features reflects, among other things, the printing technology of the time, the way teachers may have used the books in the classroom, national educational policy and publishers' ambitions to sell books. Each of these examples typifies the visual characteristics of books produced around the time each was published. The bee pictures are just one example from a larger study that has looked at changes in visual organization in children's reading and information books from 1860 until the present day. Part of this work has been the development of an approach to systematic description and analysis of the visual characteristics of these books. It takes forward the more general idea that in order to understand language use you need to analyze and describe its characteristics and work out why particular choices have been made. Such descriptions of graphic language remain relatively rare compared to, for example, description of varieties of spoken language.

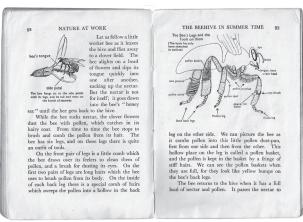
figure 1. top 'Standard II' from Specimen pages of Marshall's Pleasant Readers, London: John Marshall ♂ Co, 1890s, pp.10-11

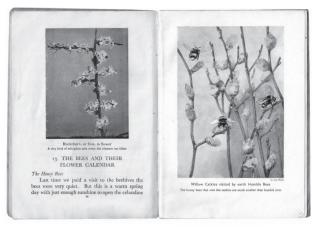
This spread is from a short section called 'Busy bees' which begins on the previous page. In common with other reading books produced at this time, the paragraphs are numbered and a list of 'new words' is provided at the end of each section. The wood-engraved illustration does not relate to a particular part of the text and thus fulfils an associative function rather than an explanatory one.

figure 2. center and bottom Spreads from E. M. Stephenson, 'Nature at Work', Book II, London: A & C Black, 1941

These spreads show different approaches to illustration: a black and white photograph, a colored 'tipped-in' plate and black and white line drawings with labels and captions. The text is organized in short sections that run throughout the book (new sections do not start new pages). Serif type is used for the main text and headings, sanserif for the captions.







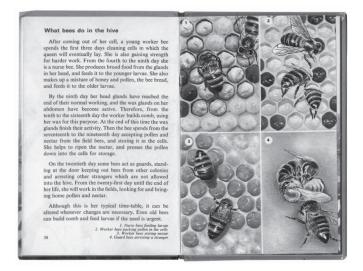


figure 3. top
Spread from W. Sinclair,
Life of the honey-bee,
Loughborough: Wills &
Hepworth, 1969

By the 1960s the use of the double-page spread as a 'container' for related text and illustration was well established. This spread follows the characteristic Ladybird books approach with text on the left and a colored illustration on the right. Captions for the illustration are placed on the left-hand page as part of the text page rather than being included in the full-page, bled-off illustration.

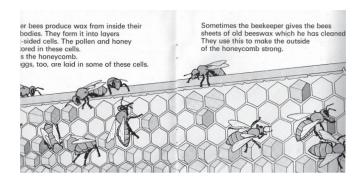


figure 4. bottom

Part of a spread from

S. Allen, Bees

make honey, Over,

Cambridge: Dinosaur

Publications Ltd, 1980

In the example from the 1980s the illustration extends across the double-page spread. The text that relates to it is divided between the two pages that make up the spread; and each block of text comprises related sentences indicating editorial decision-making.

THE ANALYTICAL APPROACH

The approach taken here had its genesis in the late 1970s and 1980s in work undertaken by what has recently been called the 'Reading School' (Bateman, 2008). Academics in the Department of Typography & Graphic Communication at the University of Reading developed interests in describing graphic language along the lines taken by linguistic scientists. Michael Twyman's 'Schema for the study of graphic language'

provided a tool for describing mode (verbal, pictorial, schematic) and configuration (linear, linear-interrupted, tabular) of graphic language (Twyman, 1979). Elsewhere he proposed that choice of mode and configuration are but two of the factors that influence the decisions that are taken in the making of a document and he listed production method (technology), the user, the circumstances of use and information content as relevant others (Twyman, 1982). Patricia Norrish's work on the graphic translatability of text identified and articulated the structural components of documents starting with the artifact itself and how it might be broken down into describable segments: body matter, front matter, end matter (Norrish, 1987). Some of this work at Reading was, unusually, concerned with hand- and typewritten documents produced by lay people, thus acknowledging, as linguists did, different levels of formality and expertise in making documents. Walker's (1982) approach was taxonomic and resulted in 'checklists' of document elements that were used to identify characteristic 'features' of particular kinds of document such as handwritten and typed letters, 'lost cat' notices and handwritten posters advertising community events. Waller's work on reader-focused notions of accessibility and structure in relation to graphic genre demonstrated the value of analyzing documents on a number of levels (see Waller 1987a, 1987b, 1991). This work was taken further by the GeM project (based at Stirling University) which identified the following levels of structure: content (the components of the information to be communicated); rhetorical (the rhetorical relationships between the 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 realize the layout elements). Each of these levels was placed within the following sets of constraints that needed 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 the circumstances

of use). The application of this descriptive approach was demonstrated in accounts of the linguistic and graphic structure of spreads from information books (Allen, Bateman and Delin, 1999; Delin, Bateman and Allen, 2002; and the approach in detail is given and expanded in Bateman, 2008). The approach described here extends some of this earlier work. It builds on the checklist formulation described above, combined with considerations that influence design decisions taken: constraints imposed by the intended readership, the circumstances of use and the technology used to produce them. Breaking a document down into elements or segments—a well-developed concept in linguistics—is a useful starting point in the compilation of a checklist. In the approach described here, the 'checklist' is a listing of the 'features' relevant to the level of description being undertaken. Using a checklist ensures that the same approach is taken to 'looking' at each of the items in a particular corpus. Each 'feature' is further subdivided into variants, attributes or states—that describe the variations that might occur within a particular feature. Thus, a checklist might contain features of 'macro-spacing,' such as treatment of paragraphs, margins and space around headings, and also 'micro-spacing' features such as type size, line spacing and word spacing, and each of these can be subdivided into the variants that might occur within each.

The checklist is just one part of this analytical approach; the second is consideration of contextual circumstances that are likely to have influenced the way that the features have been organized or treated and that therefore should be considered in any analysis. This approach stems from the practice of designing documents and the contraints imposed by questions a designer might ask: How and where will it be used? Who are the readers? What kind of information does it contain? What constraints does the technology being used impose? Is the reader likely to have expectations about the 'look and feel' of the document? Consideration of the constraints and influences imposed by the context in which something is designed and produced enables a richer description of children's books (or any graphic genre) that would result from a description based on a checklist alone.

1 (see Walker, 2001, pp.23-9).

COMPILING A CHECKLIST

Compiling a checklist can be done in a number of ways. One starting point, for example, has been consideration of rules and conventions that underpin some document types (Walker, 2001). In trying to work out what features might be relevant in a checklist designed to describe the graphic attributes of 'lost cat' or jumble sale notices, for example, consideration of rules that children learn at school, and that become part of a non-designer's graphic repertoire, would suggest that use of capital letters and underlining would be essential features to include. A checklist used for a description of handwritten and typed correspondence included features relevant to the capture of information relevant to that particular graphic genre and for which there were conventions, such as the setting out of the 'inside address' or the 'complimentary close'-features at a macro level of organization heavily influenced by letter-writing prescriptions. Features such as 'treatment of the date' allowed for description at a micro level of visual organization and included such attributes as the use of superior figures and of abbreviated forms of the date.

The checklist presented here was developed through consideration of design attributes relevant to children's reading, such as typefaces and spacing, the relationship of pictures to |text, and page size and format. It was organized in four sections each comprising features relevant to the analysis: artifact description; document structure and articulation of content; typography; and illustrations.

ARTIFACT DESCRIPTION

Can the book be easily held by small hands? Do the pages open easily? Is the cover material durable? The materiality of children's books can be an important reflection of the extent to which they have been designed with the needs of children in mind. Features in this section of the checklist included size and format, binding, printing process and paper.

DOCUMENT STRUCTURE & ARTICULATION

This section comprised features that define the structure of a document, the way that its content might be organized, and the way that the articulation of this structure helps or hinders access to it. Following Norrish (1987) the term 'extra matter' was used to distinguish between the main information content of the artifact (body matter) and the other 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, notes for the teacher, publishers' advertisements; in an information book the list might extend to include a list of references, index, glossary and list of illustrations.² Such features can provide information about how a book might have been used in the classroom, about innovative features and about publishers' approaches to marketing. Some components classified as 'extra matter' were navigational aids, such as contents pages and indices. The body matter in a children's book may be structured through additional navigational aids such as headings, key words in the text and page numbers; and in information books extended to captions, graphic devices such as arrows and bullets and summary text.3 The organization of the contents of the books, into broad structural units (sections, chapters, double-page spreads, single pages) has been defined by Waller (1991) as 'artifact structure': "those features of a typographic display that result from the physical nature of the document or display and its production technology." In the checklist the term 'information unit' was used with the aim of capturing the extent to which topic boundaries coincided with pages or openings. In children's books, especially those produced for younger readers, there is often alignment of a topic or story within the constraints of a page or double-page spread (FIGURE 5).

TYPOGRAPHY

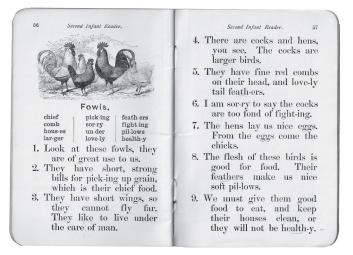
The features included in the 'typography' section of the checklist were those particularly relevant to a broad diachronic study of children's reading books, and were therefore at a fairly coarse-grained level of analysis. Thus, typeface names were

- 2 As Norrish reported, it was 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 relationship to the artifact as a whole." (Norrish, 1987, pp. 10-11). In design terms, too, this approach reflected the way that many books are designed, the body matter being designed before the material around it.
- 3 Waller (1987a) used the term 'global' to refer to devices that help to make sense of the structure of a document as a whole, and 'local' to those that guide readers round parts of a text and help to establish hierarchy and structure.

figure 5.

Spreads from Second book, 'The graphic infant reader,' London and Glasgow: Collins, 1891, pp. 56-7 and from M. O'Donnell and R. Munro, Out and about, 'The Janet and John Books,' London: James Nisbet, 1949, pp.18-19

In these examples the 'topic,' a set of related and semantically coherent graphic elements, coincides with a structural component of the book, a double-page spread in Second book, and the page in Out and about.





not as relevant as broad category: serif or sanserif typeface, or whether it was a script or handwritten form. Information about the spacing of type, however, was gathered in detail because of the inter-relationship of typesize, line length and space between the lines, and the effect of this on ease of reading. Features such as the treatment of the start of paragraphs, and differentiation of key words were important because of their relevance at particular periods of time to methods of teaching reading.

ILLUSTRATION

Pictures are integral to most books for children. Relevant here were features relevant to visual aspects such as the use of color, or the location of a picture on a page (rather than contentrelated aspects, such as gender portrayal, or stylistic issues). In information books the functional use of color to articulate content (such as the use of red to show those parts of a picture that represented heat), or structure (such as the use of color to draw attention to those parts of a picture that were mentioned in the text) was recorded. The position of a picture in relation to the text that referred to it indicated the extent to which the design of the book may have been influenced by consideration of the reader.

FEATURES & ATTRIBUTES

Within each of the checklist sections described above, features considered to be relevant to a description of the visual organization of reading and information books were identified. This was done by looking at a representative selection of children's books from the 1880s to the 1960s, in order to get an overview of their characteristic features. Each feature was then broken down into 'states' or 'attributes' that reflected the intended level of detail in any description. It would be easy to go into considerable detail about, for example, the binding of the books, but for the purposes of this study what mattered was whether books could be opened flat and whether they were bound in such a way to support extensive use. With regard to document structure and articulation, for the level of description required, noting presence or absence of a feature was sufficient as, for example, in the case of 'extra matter.' For the purposes of this study whether or not books had a contents page or notes for the teacher was more relevant than the typography of each because the study was concerned with access and navigation, not contents page typefaces and their articulation. However, in the case of headings, as well as noting presence/absence of levels of heading, the particular typographic treatment of that heading so that it was differentiated from the main text was also relevant to the study, so the checklist allowed for the recording of

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a range of variants, and inclusion of the attribute/state 'other' meant that anything unusual could be noted. The list above gives examples of feature and attributes from the children's books study. The full checklist, showing the features and attributes in each of the checklist sections, is shown in Table 1.

This checklist has been used to gather data from a selection of young children's reading and information books dating from 1830 to 1960 published in the UK; it underpins the Typographic Design for Children database (www.bookdata. kidstype.org)⁴. The database can be interrogated in different ways to enable synchronic and diachronic comparison and description. Such description provides a picture of the graphic language of children's books; and through this an awareness of the characteristics of selected features at a particular period of time, or of the extent that usage changes over time.

4 The information books part of this site is still under development but formed the basis of a study of children's information books by Robson (2007).

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MAIN TEXT TYPOGRAPHY Colour use in text (reading books only) colour used for o heading(s) o main text o supplementary text o old style o captions o moden o labels o transitional o other o slab distinction of o sanserif o letter o grot o word o humanist o phrase o geometric o script typeform o paragraph o handdrawn/stencilled o other: infant characters function o yes o decorative o no o articulation of structure x-height mm o articulation of content cap height mm point size(based on [eg type specimen]line feedmm ILLUSTRATION line length mm type of picture o line drawing word spacing o simple shaded drawing o normal o detailed shaded drawing o photograph o wide o map o variable o plan letter spacing o diagram o bar chart o normal o narrow o pie chart o wide o other o variable o diagram average no. of characters per line position of picture in relation to text o above text that refers to it alignment o below text that refers to it o ranged left o integrated across spread o justified o to right of text that refers to it o centred o to left of text that refers to it hyphenation o surrounded by text that refers to it (as text runarounfd) o yes o between text that refers to it o no o no visual relationship to text no. of columns o text on verso, picture on recto o text on recto, picture on verso treatment of the start of paragraphs o indented treatment of picture o indented plus space o squared up or boxed o full out o bled off o full out plus space o no boundary / vignetted / cut out o first line extended to the left o plate o first line extended to the left plus space o other o numbered and indented colour or not 0 numbered and indented plus space o black and white o numbered and full out plus space o single colour o numbered and first line extended to the left o quite colourful o numbered and first line extended to the left and space o very colourful o other paragraph treatment colours applied to differentiation of key words o all foreground elements o no differentiation o bold o some foreground elements o all of background o italic o some of background o caps function of colour o colour o decorative o typeface o articulation of structure o type size o underlining o articulation of content o other: basis for colour choice o realistic/associative o other: position o on same page that refers to it o on same spread that refers to it o on different pages

THE CONTEXT IN WHICH DESIGN DECISIONS ARE MADE

As well as providing information about language in use, and about book design in particular, this approach to description that considers a range of contextual elements, such as educational policy, legibility and vision research, typeface manufacture and advances in printing technology, and reinforces the view that the designing of the visual presentation of information is frequently constrained by external factors.

The pages from books about bees, described at the beginning of this essay show how text and pictures were integrated within the pages of a book and how this integration has changed over time. The analytical approach described here encouraged exploration of this integration by considering why a particular text/picture relationship occurred. In the case of the bee spreads, changes in printing technology, in particular, printing in color and typesetting methods, have determined how the text and pictures have been organized, and show the move from text-picture organization influenced by production methods and printer-led conventions to that influenced by consideration of the child reader.

Two further examples demonstrate the influence of contextual factors on the visual organization of reading books. First, that of educational policy in Britain through the impact of the Revised Codes at the end of the nineteenth century, and secondly, legibility and vision research in the early part of the twentieth.

The 'Revised Code' was a set of recommendations made by the Newcastle Commission, which had been set up in 1858 to look at the provision of elementary education for all. 6 Schools had to have an annual inspection, and children had to learn parts or all of their reading books so that they did not fail in front of the Inspectors (Altick, 1957). After 1862 many publishers began to produce series of books that were differentiated by content (as defined by the requirements of the Standard or 'reading age,' and was usually defined by the number of syllables in a word) and by visual attributes (those for the infant classes having larger type and more pictures

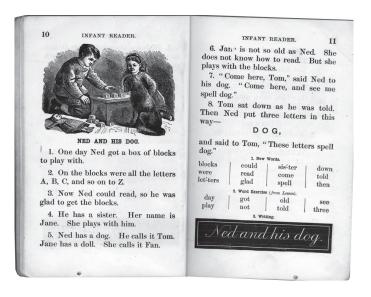
- 5 Schriver (1997) used the term 'rhetorical cluster' to identify groupings of verbal/pictorial elements that identify a particular graphic genre. She provides as examples body text with footnotes' and 'illustrations with annotations.' Such clusters in the bee spreads vary according to when they were published, though 'text and related, sometimes annotated, picture' could be defined as such in those books.
- 6 The most notable outcome of the Commissioner's report (1861) was that financial aid to schools should depend in part on attainment of pupils as measured by an inspector's examination in reading, writing and arithmetic. Robert Lowe, responsible for implementing the Commission's recommendations, devised the Revised Code (1862) which became known as 'payment by results' (Altick, 1957).

than those in the higher ones). In making books, printers and publishers responded to the directives in the Codes, for example, that books for younger children should comprise 80 pages of small octavo text; that two pages should be considered as the minimum for an effective reading lesson; and engravings, lists of words and names, and supplementary questions or exercises should not generally be taken into account in computing the contents of the books. As a result, and confirmed through the study of books in our database, primers for younger children were typically broken down into two- or three-page sections that contained a list of new words, a picture, a series of numbered paragraphs followed by a word exercise and some letters or words for writing practice (FIGURE 6).

figure 6.

Spread from The Queen infant reader, London:
Nelson, 1880s, pp.10-11

This is a typical example of a reading book at the end of the nineteenth century, and it follows prescriptions defined by the 'Revised code.' Much of this book is made up of short sections often presented as double-page spreads. Each contained a picture, a title in capital letters, text broken down into numbered paragraphs, a listing of new words, a word or spelling exercise and a handwriting specimen.



There was fierce competition between educational publishers and a notable increase in the number of reading books produced. Publishers attracted their markets through different means: Longmans in their 'New Readers' used distinctive and rather eccentric typography to promote a 'look and say' approach to teaching reading; Macmillan's 'New Literary Readers' used a particular and consistent style of illustration and Collins' 'School Series' of Graphic Primers and Readers took advantage of new ways of printing in color.

Legibility and vision research undertaken at the beginning of the twentieth century contributed to the findings of a Report on the influence of schoolbooks upon eyesight, produced by the British Association for the Advancement of Science in 1913 (see Venezky, 1984). This Report, which included recommendations for typeface, type size and spacing for particular ages of children, was taken very seriously by publishers at the time. Although the Report provided illustrations that showed recommended typefaces and line spacing for particular ages of children, the feature that was to have the most impact was that of type size: 'the size of the type-face is the most important factor in the influence of books upon vision.' Many reading books in our database published between 1915 and 1925 were set in large sizes of type often without corresponding space between the lines, and certainly with rather less interlinear space than most designers would consider appropriate today. When combined with the widespread use of justified setting without word breaks it resulted in pages that appeared over-crowded with very uneven spacing between words that must surely have been difficult for children's reading (FIGURE 7).



- I. The pail was full when Jack fell down the hill.
- 2. Jack had to pull the pail up from the well.
 They ran down the hill. That is why they fell.
- 3. Jill was sad when Jack had a fall.
- 4. He must keep very still in bed, or his crown will not mend. 5. Jill is small, but Jack
 - is tall.

figure 7.

Spread from Book IA,

"The songs the letters
sing." London and
Glasgow, UK: The
Grant Educational
Company [c1919], pp.
24-25

An example of a book set in a large typeface where close line spacing and variable word spacing as a result of justified setting makes a page likely to have been difficult for children's readings.

A final example draws attention to the pervasive influence that typesetting and book design conventions can have on visual

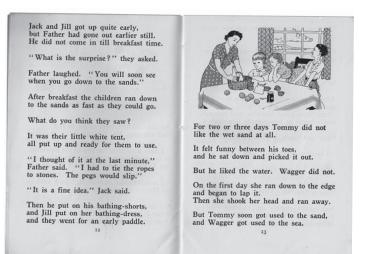
7 That children would benefit from word spaces wider than those used for adult reading was recommended both by typographers and psychologists. Dowding (1954, p.4) noted that: ". . . quite wide spacing is desirable between the words of a children's book." And Cyril Burt (1960, p. 253), in the context of close word spacing used by printing firms urged: "For younger children, I would suggest at least double this amount of spacing [this would have been a Monotype 'thin' space] and even for older children a 'thick space' should in my view be the maximum rather than the minimum."

figure 8.

Spread from Frances Roe, At the seaside, "Fundamental Reading D1." London, UK: University of London Press, 1944, pp.12-13

This example with rangedleft typesetting has wide spaces between words and additional word spacing at sentence ends.

organization, and suggests that any description of books for children's reading needs to take account of these. The recording of attributes of micro-typography: letter, word and line spacing and text alignment meant that we were able to confirm that typesetting conventions over-rode to a considerable extent recommendations in reports such as that mentioned above. Until the 1950s the most common recorded attribute for word spacing in the corpus was 'variable' resulting from the book design practice of justified setting. This convention was so firmly embedded that the resulting variation in word spacing was not thought to be unusual. In many reading books produced in the first two decades of the twentieth century the combination of large type sizes with justified lines resulted in extremely variable word spacing that significantly impaired horizontal cohesion within a line of type. In some cases this was further disrupted by additional space between letters as well as words. By the 1950s, however, ranged left setting was the norm and in many cases the space used was wider than what would have been used typesetting books for adults. Nevertheless, this 'variable' continued to be recorded in relation to books from these decades because in some case additional space was inserted at sentence ends (sometimes equivalent to three times the word space) (FIGURE 8).



The approach described above has been used to date to provide an account of the introduction of sanserif typefaces and the development of a more child-friendly approach to book design for children's reading (Walker, 2007); and to picture/text relationships and the meaningful use of color in children's information books in the latter part of the twentieth century (Robson, 2007).

The kind of close analysis that is afforded by the use of the checklist, such as that used here for children's books, remains unusual, yet it provides a way of looking at documents on a number of different levels—their broad structural make up to micro-spacing—which help us understand better how documents are used, and how they might be designed. With regard to children's books it has shown that design decisions are influenced by many external factors and that these determine what becomes conventional usage at a particular period of time.

ACKNOWLEDGEMENTS

My thanks to Mary Dyson for her comments on a draft of this text; and to Polly Harte for helping to source books about the life and work of the honey-bee. This work was part of the Typographic Design for Children Project at the University of Reading, UK, funded by the Arts and Humanities Research Council.

Tracing copyright holders for children's books is difficult, and I offer apologies to any copyright holders whose rights I may have infringed in good faith. The images are reproduced from books in my own collection or from the Lettering, Printing and Graphic Design Collections at the University of Reading. Specifically I would like to thank Althea Braithwaite, Dinosaur Publications for permission to reproduce a spread from *Bees make honey* shown in FIGURE 4; Ladybird Books for a spread from *Life of the honey-bee* shown in FIGURE 3 and Lutterworth (James Nisbet) for a spread from *Out and about* shown in FIGURE 5.

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IMAGINE HOW IT WOULD BE TO LOSE YOUR ABILITY

to recognize letters and numbers. From one moment to the next, no longer being able to use your phone, tell time, turn on the TV or read the simplest instructions—having no idea what message the text is trying to communicate; all you can see are rows of black and white abstract forms.

This is what happened to me.

I am a type designer. I design letters for printed material like the text you are reading now. I also work as an academic researcher studying the legibility of typefaces. My work is focused on defining the letter shapes that make the typeface perform the best under various reading conditions. My situation was therefore extraordinarily peculiar and frightening to me.

We know very little about what actually happens in the brain when we read. But a look at the collective results of the various reading studies suggests that a fluent reader is influenced by a range of actions when recognizing a word, the two most dominate of these, each have their

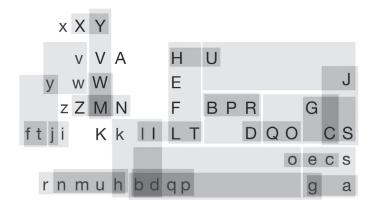


figure 1.

The bottom up operation compares the individual features of the letters and identifies the features that separate one letter from the others.

own outset.

One is a bottom up operation where we identify the individual features of the letters in question. A look at a given word will start a comparison operation on each letter. If the operation identifies a round outer shape, it will exclude the possibility of the target being a letter such as 'I,' 'k,' 'm.' A lack of

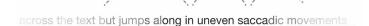
extending elements, will further exclude the possibility of the target being a letter such as 'b,' 'p,' 'q' and 'd,' and so on. Finally the operation will have narrowed the possibilities down to a selection of similar letters such as 'o,' 'c,' and 'e.' When a crossbar in the middle and an open space to the right is identified, we will know that the character in question can only be the letter 'e' (Rayner and Pollatsek, 1989, 11-15).

The second operation is top-down driven. It is a more holistic approach built on a lexical library of syllables and words. Based on the collective material we have read before, the brain quickly runs through all possible combinations (McClelland and Rumelhart, 1981; Paap et al., 1982). The lexical operation is so efficient that you can read a text even when several of the letters are missing or have swapped places (Rayner et al., 2006).

There is more to reading than recognizing words. Another important process is related to our perception of sentences and paragraphs. While reading, the eye does not flow consistently across the text but jumps along in uneven saccadic movements. For the eye to predict where the next break between the jumps should occur, the peripheral area to the right plays a central role. With our consciousness we read the text in focus, however while we do so, the brain also recognizes what happens in the text to the right. This process is quite central in helping us predict what comes next and to act accordingly (O'Regan, 1979; McConkie and Zola, 1984).



Information obtained in the peripheral area of the eye, will dictate where the eye should focus next.



During the birth of my son last year, a case of severe pre-eclampsia affected the area of my brain responsible for processing visual information. The first sign that something had changed came at breakfast time the following morning. When I wanted to make my daily order from the hospital menu card I discovered that I couldn't focus on the text. At first I

discarded this as stress due to my new situation as a mother. But later in the day, when I felt more relaxed and at ease, I realized that the problem had not gone away. I still couldn't read the menu. To my big surprise I found that I could also not write down the food that I wanted to order. The simplest words appeared like alien writing. I went to the bathroom and saw the word 'soap' on a container mounted on the wall, I decided that since I didn't know the letters, this must be Cyrillic or another writing system unfamiliar to me. I then realized that I had also lost parts of my vision, which doctors later identified to be the right peripheral area on both eyes, the area that is so important for the reading and understanding of sentences.

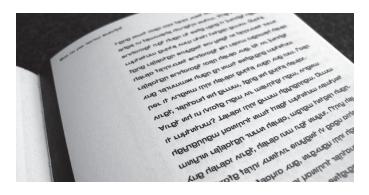


figure 3.

Letters of the Latin alphabet appeared like abstract forms to me.

For the first time as an adult, I saw the Latin alphabet as pure shapes without understanding their meaning. It dawned on me that even if this condition were permanent, I would still be able to design letterforms. Although I had lost the skill of writing and understanding each letter of the alphabet, my knowledge of the letter shapes had not disappeared. The pressure in my brain had influenced my mental library for recognizing letters and words, but had no effect on my ability to perceive forms. I could see the objects, but had no knowledge of their name and function.

To my great joy, the condition turned out to be reversible, and my reading and writing skills gradually returned. The first sign indicating that things would come back to normal came after a week or so when I suddenly realized that I

once again could tell the letter names. I was over the moon and eager to start reading again, it was however, not as easy as I had hoped. When I tried to spell my way through words, I couldn't remember the sounds that the different letter combinations make. In other words, the bottom-up operation of connecting parts of the letters had returned to me, however without the lexical information of syllables and words from the top-down operation, I was still incapable of reading anything.

The top-down operation was later to return in various steps. It began with a hunch about the meaning of a couple of words in a newspaper article; I had a feeling I knew the words, I just couldn't tell what sounds the different parts of the words made. The word lexicon had returned before the syllable lexicon, thus indicating that these might actually be two separate processes in the brain.

Eventually the syllable lexicon came back as well. I could read two or three words at a time, but with no peripheral vision to the right, reading sentences was impossible. Without any information about the coming words, my eyes had no idea where to focus next, and I therefore felt completely lost in an orgy sof letters and words. Eventually, my full vision came back and two weeks after giving birth my reading skills had returned entirely.

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BETH E. KOCH

EMOTION IN TYPOGRAPHIC DESIGN: AN EMPIRICAL EXAMINATION

BETH E. KOCH, PhD, is an Assistant Professor of Design at The University of Minnesota Duluth (USA) where she serves on the graduate faculty and teaches typography, graphic design, interactive design and senior and graduate studio courses. Apart from teaching and academic administration, her extensive experience in practice has garnered numerous prestigious design awards. Early in her career, Koch was trained to set hot and cold type (handset metal and wood type, Linotype, Typositor, Compugraphic Photo Typesetters and eventually on computers). Her love of typography is evident today in her current research in visual literacy that examines human emotional response to typographic design elements.

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There are virtually no rules to empirically interpret the meaning inherent in typeface designs—people intuitively decipher typefaces (Van Leeuwen, 2005). Forty-two participants examined six alphabets and responded using an online questionnaire to discover

- 1 _____ whether viewing typefaces produces emotional responses,
- 2 _____ whether people have the same emotion responses to typefaces and
- 3 _____ whether certain emotions are predominantly associated with the formative design features of typefaces—classification, terminal shape, character width and weight.

Psychological research about the role of emotion in visual processing was combined with an interactive animated questionnaire methodology (Desmet, 2002), and the resulting data were analyzed in a matched t-Test design (α =.05, 95%). This human-centered empirical approach proved a promising methodology for design research that successfully eliminated problems evidenced in previous object-centered typography studies. Because people reported similar emotion response to the design features, this study suggests that design's underlying features represent a common visual language.

GRAPHIC DESIGN PLAYS AN IMPORTANT ROLE IN

helping people to decipher meanings, prioritize information, and judge the personal relevance of communications by injecting emotion into visual messages. However most designers don't understand that what they are really selling is emotion (Karajuluoto, 2008). Designers must begin to go beyond form, function and aesthetics, according to Robinson (2004), to integrate aspects of "emotional awareness." Typography is one area of graphic design that telegraphs the tone and attitude—the emotion—of communication. This study provided evidence about the role of emotion in visual perception of the formal graphic elements that make up typographic forms.

While much is known about how the brain processes components of vision (motion and spatial relationships: Merigan & Maunsell, 1993; color: Zeki, 1973, 1974b, 1977; Merigan & Maunsell, 1993; edges: Zeki, Perry, et al., 2003; form (shapes): Gulyas & Roland, 1994; Gulyas, Heywood, et al., 1994; Grill-Spector, Kushnir, et al., 1998; Merigan & Maunsell, 1993; Marcar, Loenneker, et al., 2004; and patterns: Pinker, 1984), zvirtually nothing is known about how categories of design elements are interpreted through emotion and perception. Or for that matter, whether design elements are processed individually, as basic visual criteria. In order to examine how people interpreted basic elements of design, this study asked people to respond to six different typefaces by indicating the emotion(s) they felt when viewing the typefaces.

This study was a significant departure from the typical methodologies used for design research. For studies inquiring about responses to visual stimuli, Morrison (1986) suggested that the response mechanism should utilize a non-verbal reporting method. A wide variety of methodological approaches and variable descriptions were utilized in previous typography studies, which limited comparison of the studies. For example, most researchers had not accounted for possible interactions between presentation form (word or pictures) and reporting method (reading, writing or interactive selection) resulting in mixed findings. (For a summary of past typographic research see Morrison, 1986; Poffenberger and Franken, 1923; Davis and Smith, 1933; Kastl and Child,

1968; Tannenbaum et al., 1964; Benton, 1979; Wendt, 1968; and Weaver, 1949.)

RESEARCH QUESTIONS AND DESIGN

In order to answer the three research questions of

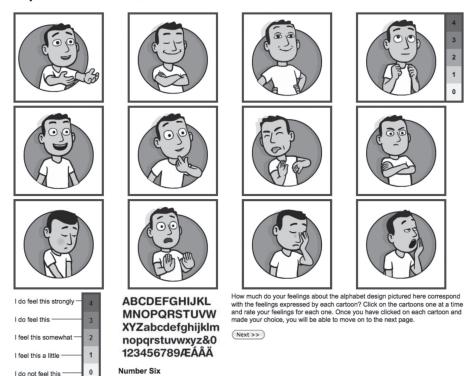
1	whether viewing specific typefaces produces
	emotional responses,
2	whether all people have the same emotion
	responses to typefaces, and
3	whether certain emotions are predominantly
	associated with the formative design features
	of typefaces.

an interactive questionnaire was selected. PrEmo™ (Desmet, 2002) is a unique scientifically validated, non-verbal, self-report, rich media research tool to measure product emotions and was the protocol chosen to measure emotion in this study. Its form is a grid of buttons containing cartoon characters that are activated by the user's mouse click. Once clicked, a character animates. It acts out the body language, facial expression and makes the sound connected with the emotion portrayed in the button. There are no labels to indicate what emotion is being demonstrated (see FIGURE 1).

There were twelve emotions, both positive and negative. Successful emotion studies in psychology measured both valence polarity and arousal strength. This study followed that precedent. Emotion arousal strength was ranked on a 5-point Likert scale labeled "0" (I do not feel this) to "4" (I feel this strongly) for each typestyle.

This study used stimuli in the form of visual alphabet samples to convey the typeface design features. The purpose of this design was to avoid an interaction between visual typeface design features and the verbal/semantic meaning of a passage of text. Asking participants to read would have defeated the purpose, which was to learn about visual literacy and how people derive emotion from viewing different design styles. Participants were asked to make emotion

Experiment Questions—6 of 6



judgments about six different typefaces by pressing each of twelve emotion character buttons and selecting a number (0 to 4) representing the strength of their feeling toward the type design.

The most well-known typeface design in the world is a typeface called Helvetica. This typeface was chosen for the study because it has relatively non-descript design features, that is, without ornament or features to indicate what situations in which the typeface might be appropriately used. This typeface is well represented in international visual culture; used in a variety of contexts and applications. Its style is seen as universal and as such, the meaning or emotion of the typestyle may be difficult to decipher.

The typestyles selected for this study consisted of six different typeface designs: Helvetica Ultra Light, Helvetica

figure 1. above

PrEmo™ interactive

animated characters

http://www.premoonline.com/en/
how-does-it-work/

Bold, Helvetica Condensed Bold, Helvetica Bold Extended, Helvetica Rounded and Glypha Medium (the only serif typeface used for comparison). In conducting studies of visual designs, there is general difficulty in isolating the multiple overlapping variables that are simultaneously present in a design, for example color, line and shape. Conducting studies that attempt to assign cause or attribute meaning to specific design features has been impossible, since too many variables confound study results (Stemler, 1997) constraining the usefulness of findings. For this reason, the typestyles were carefully chosen for their homogeneity.

The simplicity of the Helvetica typeface family made it an optimal choice as the basis for stimuli selection since its attributes could be carefully controlled through specific matched pairing. The study adopted an alpha level of α =.05 in the Paired t-Tests. Corresponding confidence level was set to 95%.

The Institutional Review Board at the University of Minnesota cleared the study design. Then invitations to participate in the study were emailed to international typography organizations, national graphic design organizations and announced on the University of Minnesota graduate student listserv. A convenience sample of one hundred adult volunteers responded.

Forty-two participants fully completed the questionnaire, providing the data for this study. Participants did not know that the typeface designs had been selected and paired according to shared and differing design features.

ANALYSIS

The data were analyzed first to determine the range and mean of the scores across all participants as a whole for each typeface. Then participant scores were used in a paired comparison to examine whether there were differences in emotion ratings arising from differences of design features between the typefaces. For example, the single design difference between Helvetica Bold and Helvetica Ultra Light was the variable of weight. These typographic design dimension pairs were as

follows: Variations in weight: the typestyle being either bold or light; variations in character width: typestyle design was condensed or extended; and variation in classification: the typestyle was either serif or sans serif, and variation in terminal style: square or rounded (see TABLE 1).

While it would have been possible to conduct this study and gather purely qualitative response, the research questions were better answered through quantifying qualitative data. Thereby, qualitative variables such as emotion responses, which we think of as highly individual could be measured and typefaces compared rather than simply describing emotions.

While physiological responses such as heart rate and perspiration, or skin conductive response are the measures most frequently employed in emotion studies, these measures don't provide sufficient information to explain behavior. Previous studies had suggested that consumer behavior (gauged by purchase decisions) is affected by the congruency of association between a typeface and a brand (Doyle & Bottomley, 2004, 2006). This study described the association between emotions and elements of typographic design construction, helping researchers more fully understand the mechanisms underlying findings in previous studies.

LIMITATIONS

This study assumes that human beings have emotions and their behavior is driven by emotions. Humans have survived and evolved in part as a result of emotion. The study acknowledges that different people have varying capabilities of emotion: some are considered emotionally advanced; some are considered emotionally handicapped; some are considered devoid of emotion due to injury or illness; and emotional dimensions change as people get older (Doost, Moradi, Taghavi, Yule & Dalgleish, 1999). This study assumes emotional competence but does not discuss emotional intelligence.

The study of emotion responses can be difficult. Asking participants how they feel can produce mixed results for a variety of reasons. In order to limit some of these problems, this

	TYPOGRAPHIC ATTRIBUTES							
	CLASSIF	ICATION	WEIGHT		CHARACTER WIDTH		TERMINALS	
TYPEFACE	serif	sans serif	light	bold	cond.	extd.	square	round
Glypha Medium	•			•			•	
Helvetica Bold		•		•			•	
Helvetica Condensed Bold		•		•	•		•	
Helvetica Bold Extended		•		•		•	•	
Helvetica Ultra Light		•	•				•	
Helvetica Rounded Medium		•		•				•

table 1.

Typographic design attributes of typeface stimuli

study used animated cartoon characters to demonstrate the emotions visually and collected data through the use of a visual response mechanism. Using this methodology, participants could register conflicting feelings, or co-occurring feelings, and even report not feeling any emotion. Responses were registered on an emotion intensity scale 0-4 that was attached to each animated emotion cartoon.

Access to the online study was limited to the first 100 visitors. Once the study was launched, it was visited as follows: 42 respondents finished the survey, 46 respondents clicked on the survey but did not participate at all, 11 respondents started but did not finish the survey, and 2 respondents were asked to test the functionality of the survey before it was launched to the public. Of the 42 participants, 76% indicated prior training in some form of design (n=32) and 24% (n=10) had no previous design experience. As a result, the majority of respondents were typographically sophisticated; a study with ordinary type users may yield significantly different results. It is also likely that other online studies may experience a similar high incompletion rate as a result of the online presentation mode, where users are inclined to act hastily. Further, the

interface design of PrEmo™ should be simplified: participants were required to click once to animate the character and pop-up the intensity scale alongside, then click again to select the strength of that emotion (0-4). With twelve emotions and six typestyles, a total of 144 clicks were required to complete the main questions in the study. It is suggested that the animation and the intensity scale should be presented at once in future interface designs in order to limit the amount of clicks required for responses.

Typestyle stimuli employed in this study are limited and therefore do not fully encompass the vast scope and range of the typeface designs available today.

An important acknowledgement of the limitations of this study is that even if one chose to develop a design and emotion guideline for designers to follow, there is no guarantee that people would respond in the intended way. Myriad influences can affect individual responses to designed communications. Stylistic fashions come and go, as do preferences for typefaces. Culture, visual trends and even age may have been factors in this study. Longitudinal studies of typography are indicated.

PAIRED T-TESTS

In this study, descriptive statistics were used to analyze the responses and observe patterns in the data (mean and range of scores). Selection of the paired t-Test statistic allowed for direct comparisons of participants' mean scores for each typeface. Paired t-Tests are designed to use one set of data and compare a second set of data to it.

The primary findings from the results of the paired t-Tests indicate that

1	people responded to type designs with emotion
	rather than indifference,
2	_ people agreed about the emotions associated
	with specific typefaces,
3	_ certain emotions were associated with the
	formative design features of typefaces.

of the positively valenced emotions, no significance was found for the emotions pride or hope, and
 of the negatively valenced emotions, no significance was found for the emotion shame.

STUDY FINDINGS

Findings from this study are as follows: Desire, satisfaction and fascination were significantly different for a typeface with 'light' weight than a 'heavy' weight. A typeface with 'heavy' weight showed significant difference for dissatisfaction and fear than the 'light' typeface. There were no significant differences reported in the terminal shape comparison, neither for typefaces with 'round' nor 'square' terminals. Desire, satisfaction, joy and fascination were reported as significantly different for a typeface that had a 'condensed' character width. Dissatisfaction, fear, sadness and boredom were significantly different for the character width category of 'extended' versus 'condensed.' Satisfaction was reported as significantly different for a typeface with a 'serif' classification versus 'sans serif' (see table 2).

Several of the findings in this study agree with Scherer's set of utilitarian emotions (anger, fear, joy, disgust, sadness, shame and guilt) that have a very high impact on behavior (2005). Participants significantly associated Helvetica Ultra Light (light weight) with desire; Helvetica Bold (heavy weight) with fear; Helvetica Condensed Bold (narrow/condensed character width) with joy; and Helvetica Bold Extended (wide/extended character width) with fear and sadness. One finding in this study agreed with Scherer's (2005) aesthetic emotions (awe, wonder, admiration, bliss, fascination, harmony, rapture, ecstasy and solemnity). Participants associated the typeface Helvetica Bold Condensed (narrow/condensed character width) with fascination.

The findings from this study clearly indicate that subjects responded to typefaces with statistically significant levels of emotion, therefore I rejected the Null H1 hypothesis, "Viewing typeface designs produces no emotional response in participants."

The preponderance of subjects reported the same

SUMMARY OF SIGNIFICANT FINDINGS $\alpha = 0.05 (95\% confidence)$			
CATEGORY: WEIGHT ANALYSIS	CATEGORY: WEIGHT ANALYSIS LIGHT		
	Desire [Paired $t(df 41) = 3.3$] Satisfaction [Paired- $t(df 41) = 2.6$] Fascination [Paired $t(df 41) = 4.0$]	Dissatisfaction [Paired $t(df 41) = 2.3$] Fear [Paired $t(df 41) = 2.5$]	
CATEGORY: CLASSIFICATION SERIF		SANS SERIF	
	$Satisfaction\ [Paired-t(df\ 4I)=2.1]$	No Significance	
CATEGORY: TERMINAL SHAPE	ROUNDED	SQUARED	
	No Significance	No Significance	
CATEGORY: CHARACTER WIDTH	CONDENSED (NARROW)	EXTENDED (WIDE)	
	Desire [Paired-t(df 41) = 3.3] Satisfaction [Paired-t(df 41) = 2.6] Joy [Paired-t(df 41) = 2.8] Fascination [Paired-t(df 41) = 2.18]	Dissatisfaction [Paired $t(df 41) = 2.05$] Fear [Paired $t(df 41) = 2.38$] Sadness [Paired $t(df 41) = 3.3$] Boredom [Paired $t(df 41) = 2.05$]	

emotions when viewing the typestyle designs. This was seen in the charts, where responses cluster together, rather than distribute randomly. Therefore based upon observation of the charts, I rejected the Null H2 hypothesis: "Subjects do not feel the same emotions when viewing different typestyle designs" (see FIGURES 2-9).

Summary of significant findings

table 2.

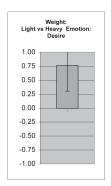
Understanding how humans respond emotionally to visual media, and knowing how the brain processes visual information has significant implications for design practitioners, design theory, design research and theory, for the field of graphic design, indeed, for individual visual consumers and society as a whole.

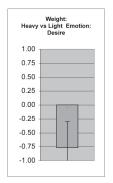
CONCLUSION

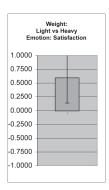
Technological advances in word processing have provided simple tools for working with type. "Non-expert typographers are becoming increasingly important shapers of our graphic language" (Walker, 2001). It is therefore increasingly important for people who use technology to understand design's visual language.

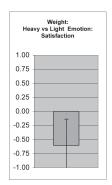
figure 2.

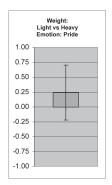
Paired comparison chart for positive emotions responses for weight

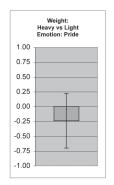


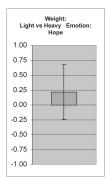


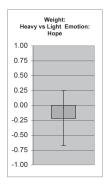


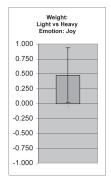


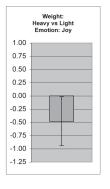


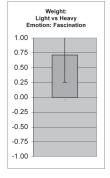












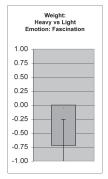
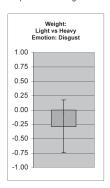
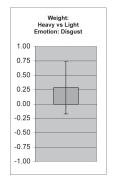
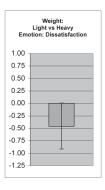


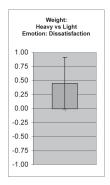
figure 3.

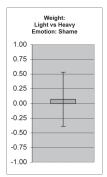
Paired comparison chart for negative emotions responses for weight

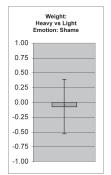


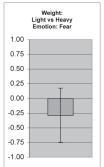


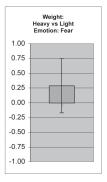


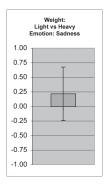


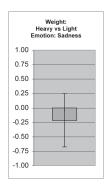


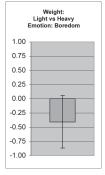












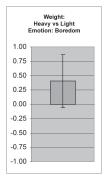
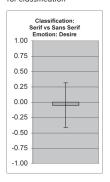
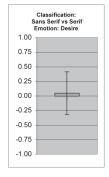
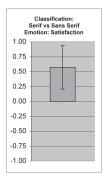


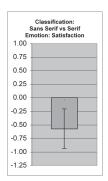
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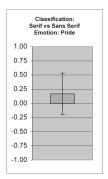
Paired comparison chart for positive emotions responses for classification

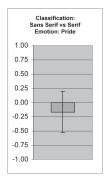


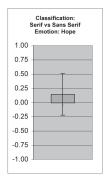


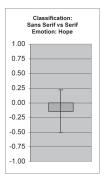


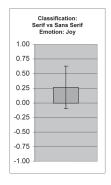


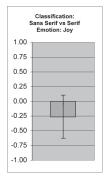


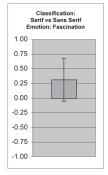












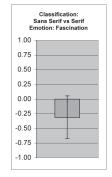
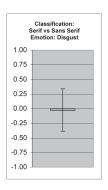
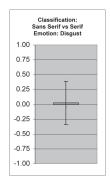
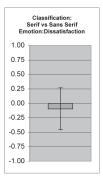


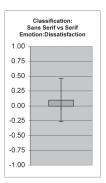
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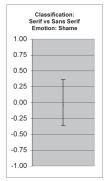
Paired comparison for negative emotions responses for classification

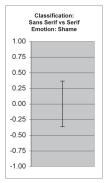


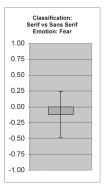


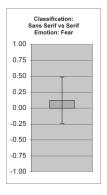


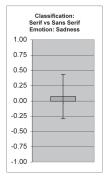


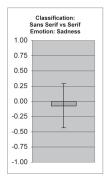


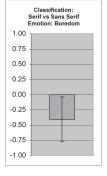












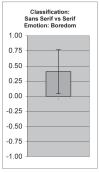
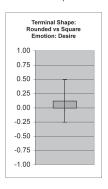
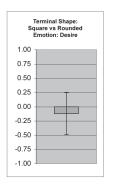
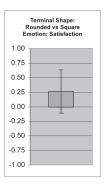


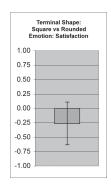
figure 6.

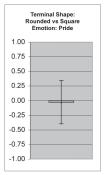
Paired comparison for positive emotions responses for terminal shape

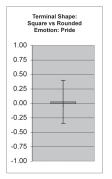


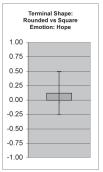


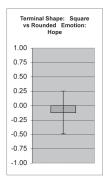


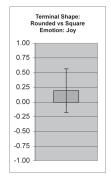


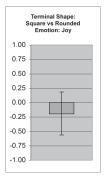


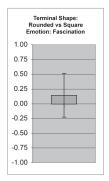












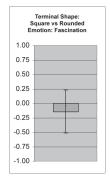
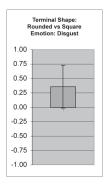
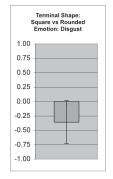
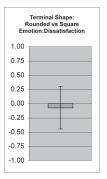


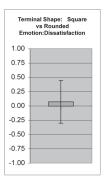
figure 7.

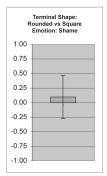
Paired comparison for negative emotions responses for terminal shape

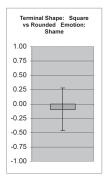


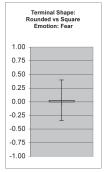


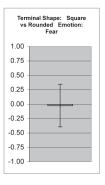


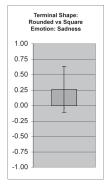


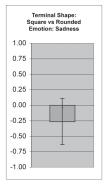


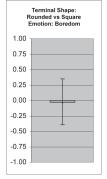












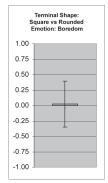
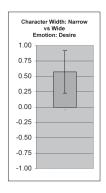
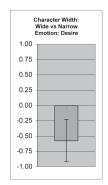
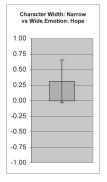


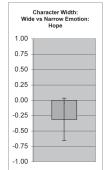
figure 8.

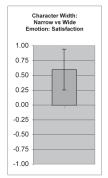
Paired comparison for positive emotions responses for character width

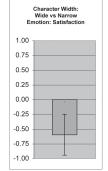


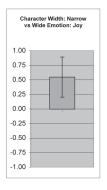


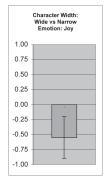


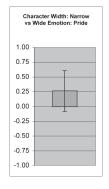


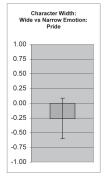


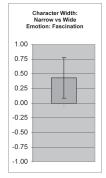












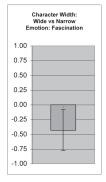
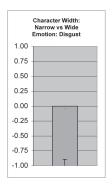
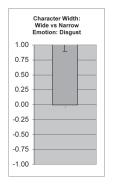
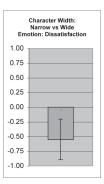


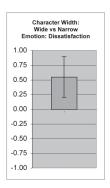
figure 9.

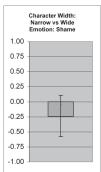
Paired comparison for negative emotions responses for character width

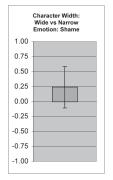


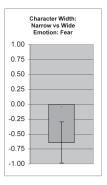


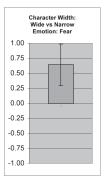


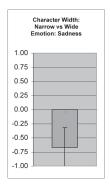


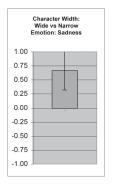


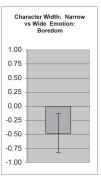


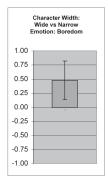


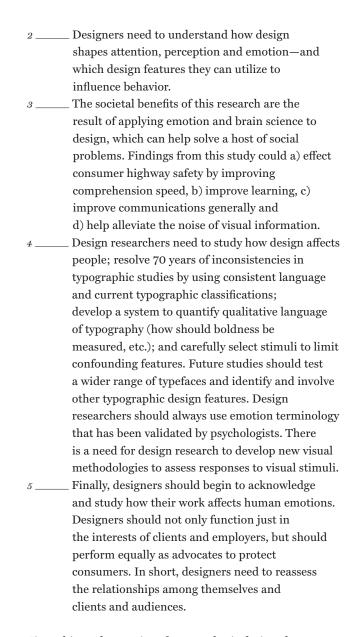












Since this study examines four very basic design elements, it also has implications for the entire range of visual design disciplines, from print to products, and experiences to information and safety. Because people reported the

same emotion responses to typographic design features, this study strongly suggests that design's underlying features represent a common visual language.

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REGINA W.Y. WANG & CHIUNG-FEN WANG

COMPOSITION METHODOLOGY OF OPTICAL ILLUSION DESIGN

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Optical illusions cause emotional surprise due to the visual experience gap between visual cognition and the actual state. Knowing the organization and layout of objects in optical illusions is important and valuable to turn a design concept of picture creation into picture and composition.

This study created a composition method for optical illusions. The research method included a two-stage investigation. The first stage uses the method of literature content analysis to develop objective optical illusion design aids from literature theories and the angle of composition. The second stage uses the method of expert opinion and design aids, as developed by this study, to validate feasibility and analyze the composition of optical illusion design.

The results are as follows: there are four composition methods, namely separation, tangency, superposition and transposition, for optical illusion design according to shape combinations, positions and directionality of objects using the coordinate axes tool. This study thus proposed a specific optical illusion composition method as reference for designers to create graphic designs.

INTRODUCTION

Arnheim suggested that artistic creation in any form should not be a mysterious and unpredictable intuitive process, but the result of exchange between rationality and sensibility (Arnheim, 1974). In the past, design was regarded as black box work (Matchett, 1968; Broadbeat, 1966; Gordon, 1961) until the emergence of the concept of design methodology (Jones, 1992). This conception attempted to present methods belonging to the personal thoughts of designers, in order to externalize the design process (Jones, 1992) and analyze design behaviors in scientific procedures to render design work easily executed and mastered.

Optical illusions have interesting visual effects, which attract viewer eyes and hold their attention during information transfer; thus, they are widely used in advertising design, artistic drawing, fashion and environmental spaces. Previous design education discussed optical illusion design, which mostly expounded various optical illusion theories related to visual perception, Gestalt laws and figure/ground from the perspective of the psychology of vision (Lauer and Pentak, 2007; Di, 2002; Wallschlaeger and Busic-Snyder, 1992). However, for the practical creation of optical illusion design, in addition to background knowledge of academic theories and the presentation of picture examples, a design method should be provided for students to follow. Therefore, this study proposed the operational definition of optical illusion design in order to establish design rules.

This study used the content analysis method to develop objective, systematic and quantitative optical illusion design aids from published theories and the angle of composition. It also applied the derived design aids to create a composition method for optical illusion design.

OPTICAL ILLUSION DESIGN AIDS

Previous discussions regarding graphic composition were based on the layout grid concept (Elam, 2004), geometrical ratio composition (Elam, 2011), drawing composition (Albert, 2003) and the correlation among object combinations in

graphic design (Tanaka, Kurumizawa, Inokuchi and Iwadate, 2000). This study integrated related published theories and deduced optical illusion design aids from

- *I* _____ the composition of objects and shape combinations,
- 2 _____ relations between composition objects and positions, and
- *3* _____ relations between composition objects and directionality of graphic design.

COMPOSITION OBJECTS & SHAPE COMBINATION

An optical illusion can be composed of different object images. In Salvador Dali's "Mysterious Mouth Appearing in the Back of My Nurse" (1941), the viewers may see the nurse and child first, or see a girl's face looming in the mountainous scenes, as shown in Figure 1. In the structure of the facial

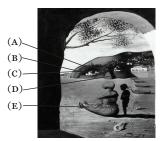
figure 1. right

Mysterious Mouth

Appearing in the Back

of My Nurse

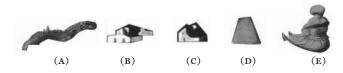
Salvador Dali (1941)



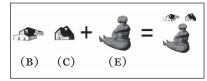
features of the girl, the eyebrow (A) is a mountain chain; the eyes are (B), (C) is a house; the nose (D) is a hill; the mouth and chin (E) is the nurse, as shown in Figure 2.

figure 2. right

Composition objects of optical illusion



An optical illusion is the cognitive process of comprehending one object from another object. The entire illusion contains overall meaning individually (Gregory, 1990; 2000; Gleitman, translated by Hong, 1995). Therefore, in the same illusion, the objects composing a picture can contain another object. As shown in FIGURE 3, the basic units of a face, such as eyes (B, C) and mouth (E) form a complete figure; while eyebrow (A)+eyes (B, C)+nose (D) form a half face.





Therefore, this paper defines the individual independent objects as an optical illusion design and independent object symbols, with the function of visually complete transitive images, as "composition objects."

Optical illusion uses form and shape perception orientation to compose different objects. The object combination modes of plane view images include, separation, contact, overlapping, transparent overlapping, combination, reduction, difference overlapping and superposition (Leborg, 2006; Lauer, and Pentak, 2007; Tanaka, Kurumizawa, Inokuchi and Iwadate, 2000). The object combinations in computer-aided drawing software include union, intersection and difference tools to interface with operating tools. Therefore, this paper refers to the shape combinations of composition objects to deduce the optical illusion design aids.

RELATION BETWEEN COMPOSITION OBJECTS & PLACEMENT

Drawing composition can be described by the placement and location of objects in a plane space (Pipes, 2008); while grid lines are a tool for defining an object's position in the picture. The grid lines provide continuity for a series of elements of plane composition, they aim to unify a set of pictures, provide a frame, direct the designer to place objects, with the composition

figure 3. above

Decomposition of composition objects of optical illusion

objects freely changing their positions and directions within the grid line unit (Cleveland, 2010; Elam, 2004; Rudolf Bosshard, 2002; André, 1996). The grid line tool provides rules for draftsmen and learners to follow (Lin, 1990; Elam, 2011), such tools are usually used in design and drawing, like scale, compasses and grid lines for regular drawing (see FIGURES 4, 5), while relative relations can be observed more objectively through grid lines (Solso, 1994; Gombrich, 1982). Therefore, this paper refers to the placement of composition objects and develops optical illusion design aids according to the concept of grid lines.

figure 4. Jan Tschichold poster design

By permission of Elam, 2011



figure 5.

Font design structure

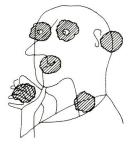
By permission of Elam, 2011



RELATION BETWEEN COMPOSITION OBJECTS & DIRECTIONALITY

The visual line (human scan) of composition refers to the sight line, which moves with the line trend when viewing the object, while the visual physiology joins psychology as led by the line, thus, inducing the viewer's visual line order (scan pattern) on the picture (Lin, 2004; Li, 2001; Fan, 2001). Stark and Ellis (1981) proposed continuous visual scanning, which







forms a scanning trace (Solso, 1994) (SEE FIGURE 6).

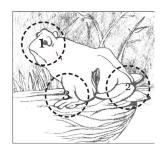
The application of visual lines can be observed from a rotated image of an optical illusion design, where an image hidden in a different direction is recognized when the direction or angle of the rotation for the image is changed (Yang, 1992; 1997). A frog or horse can be seen in Figure 7, depending on the direction from which the viewer sees the optical illusion; the interesting point is that the observation direction

figure 6. above

Feature chain—visual scanning trace

proposed by Stark and Ellis, 1981; cited by Solso, 1994







must be changed to perceive it. Visual line (scan) explains the directionality of the composition and the objects in the picture; therefore, the axis of a visual line can be used as a design aid for deducing optical illusions.

BRIEF SUMMARY

This paper proposes the composition method of using the coordinate axes tool to measure optical illusions according

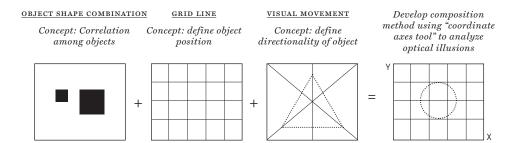
figure 7. above
Different images
understood from
different viewing angles
of image rotation

Reproduced from the Horse and Frog designed by an anonymous painter in 1880

to shape combinations, placement and directionality of composition objects in the image, as well as the correlation among the objects in the plane space. As coordinate axes are used in designated positions, each point in a three-dimensional space can be indicated by three parameters, which are concepts of position, directionality and 3D. The resulting coordinate axes tool concept development is diagrammed in FIGURE 8.

figure 8. below

Coordinate axes tool development analysis process



USE COORDINATE AXES TOOL TO ANALYZE OPTICAL ILLUSION DESIGN

This section investigates the composition method of optical illusion design using the expert opinion method in optical illusions, as based on the coordinate axes tool derived from literature.

TEST SAMPLES

The samples of this study are derived from a series of books written about optical illusion design by an American visual perception scholar, Al Seckel, during 2000-2006: The Art of Optical Illusions (2000), Great Book of Optical Illusions (2004), Masters of Deception (2004), Impossible Optical Illusions (2005) and Optical Illusions: The Science of Perception (2006). Non-graphic geometric optical illusions, photographic optical illusion pictures and repeated optical illusions are deleted from the samples, for 115

research samples. The optical illusion picture samples are exported by Photoshop as 12x15cm grey graph cards.

SURVEY PARTICIPANTS

Eight expert members, with an average of eleven years of experience in design, drawing and design education background were invited to engage in expert group discussion. A brief profile of participants is in Table 1.

table 1. below Profiles of expert group members

TESTEE	GENDER	OCCUPATION	EXPERIENCE	SPECIALTY
A	FEMALE	Teacher, Department of Design	15 years	Basic design, design drawing method
В	MALE	Teacher, Department of Design	+16 years	Visual cognition, computer-aided drawing
С	FEMALE	Teacher, Department of Design	+16 years	Visual communication design
D	FEMALE	Visual designer	7 years	Visual communication design, design project management
E	MALE	Design project manager	10 years	Product development, design project management
F	MALE	Senior designer	8 years	Industrial design, human factors, interface design
G	MALE	Senior designer	7 years	Product development, design planning
Н	FEMALE	Designer, illustrator	12 years	Graphic design, illustration

SURVEY PROCEDURE

The 115 optical illusion samples are identified by group consensus. The composition objects causing optical illusions are visually marked by the coordinate axes tool, according to their placement, directionality and composite relation among the objects in the picture as the basis for analyzing the optical illusion composition method. The analysis process is shown above (see FIGURE 9).

figure 9 . below optical illusion composition method analysis proces

Salvador Dalí (1941),

ANALYSIS PROCESS

STEP 1:

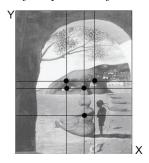
115 optical
illusion samples



STEP 2: Composition objects causing optical illusion



STEP 3: Coordinate axis positions of composition objects



2 _____ The composition method of 115 optical illusion samples is analyzed by the coordinate axes tool, and the analysis results are called the "composition method category."

COMPOSITION OF OPTICAL ILLUSION DESIGN

Based on 115 optical illusion samples and viewers' shape identification of optical illusions, four composition methods, namely separation, tangency, superposition and transposition are proposed using the coordinate axes tool according to the position, shape combinations,

COMPOSITION METHOD	1. SUPERPOSITION COMPOSITION	2. TANGENCY COMPOSITION		
Schematic diagram	object - "A" object - "B" X	object - "A" object - "B" X		
Description	-Shape combination: objects do not intersect or contact each otherPlacement: there is distance between the placements of objectsDirectionality: objects have identical directionality.	-Shape combination: objects are adjacent, edge contour lines are tangent, but the object shapes do not overlap each other and maintain their original shape. -Placement: there is no distance between objects. -Directionality: objects have identical directionality.		
COMPOSITION METHOD	3. SEPARATION COMPOSITION	4. TANGENCY COMPOSITION		
Schematic diagram	object - "A" object - "B"	object - "B" X "B" - Joeldo		
Description	- Shape combination: more than two images overlap, forming image union or intersection Placement: object placements are partially identical, overlapping in the same position Directionality: objects have identical directionality.	-Shape combination: the same object, object maintains the original shapePlacement: object placement and angle changeDirectionality: object placement rotates.		

table 2 . above

Composition methods of optical illusion design

directionality of objects in the picture and the correlation among objects in the plane space. The composition method is as shown in TABLE 2 and described below.

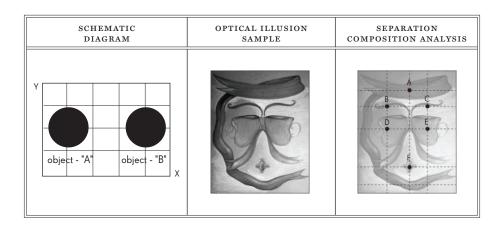
Based on analysis results of the optical illusion graphics above, this study asked design students to design optical illusion graphics (FIGURES 10, 11, 13, 15 and 16), according to the principles for the composition of four object locations, namely "separation," "tangency," "superposition" and "transposition," as the examples of composition of four optical illusion graphics, as well as to verify the feasibility of the composition.

SEPARATION

When objects compose an entire image, the shape contour line of each main object does not intersect or contact that of other adjacent objects, and the object maintains its original shape. There is a distance between the placements of objects. As shown in Table 3 (Figure 10), the overall visual graphic is composed of ribbons (objects A, B, C, D and E) and an airplane (object F), these objects constitute a human head image. In the location configuration of the image composing objects A, B, C, D, E and F, the objects do not intersect or contact one another and their original shapes are retained.

table 3, figure 10. below Separation composition analysis

Permission and drawing by Yun-Hsiao Hsu, 2010



TANGENCY

When more than two different or identical objects compose an entire image, the object shapes are adjacent, the edge contour lines are tangent; however, the object shapes do not overlap each other and they maintain their the original shapes. There is no distance between objects. As shown in Table 4 (Figure 11), it is an optical illusion design composed of a goldfish (object A) and a seahorse (object B), the goldfish (A) is adjacent to the seahorse (B), the edge contour lines are tangent and shared; the goldfish (A) and seahorse (B) do not overlap, the complete shapes of the goldfish (A) and the seahorse (B) are maintained and the shapes are not covered; there is no spatial distance between the placements of the objects.

Shigeo Fukuda (1975) image of male/female legs is the representative work of adjacent composition of optical illusion design (see Figure 12). table 4, figure 11. below Adjacent composition of optical illusion design

Permission and drawing by Yi-Ji Xiao, 2010

SCHEMATIC	OPTICAL ILLUSION	ADJACENT	
DIAGRAM	SAMPLE	COMPOSITION ANALYSIS	
object - "A" object - "B"			

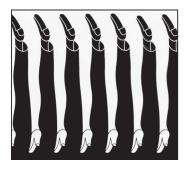


figure 12. left

Adjacent composition of optical illusion design

Fukuda Foundation, 2011

SUPERPOSITION

More than two shape images with complete meaning can be identified in a graphic design. As shown in Table 5 (FIGURE 13), the overall optical illusion graphic presents a young woman and a young man in the same space. However, the selection of visual movement may determine the image to be viewed. If the visual movement "A→B→C→D" is selected, a viewer may see a young woman covered by a blanket on a bed. The horizontal line between points B and C is the edge of bed quilt. If the visual movement "E→F→G→H" is selected, a viewer may see a young man placing his legs on a rope, and a vertical three-dimensional space is between points F & G (FIGURE 13B). Two spaces are exhibited by the same image composed of B, F, G and H.

Furthermore, the superposition composition overlaps more than two images to form an image union or intersection (see figure 14), or uses a shape to shield another shape, where the composition objects are partially shielded, and the two shapes have identical shape elements (see figure 15).

table 5, figure 13. above Superposition composition analysis

Permission and drawing by Su-Fen Zhao, 2010

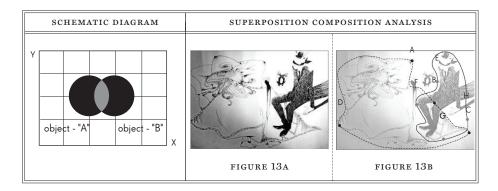




figure 14. left
Superposition of
more than two images
overlapped

Permission and drawing by Dick Termes



figure 15. left
Superposition
composition of a shape
shielding another shape

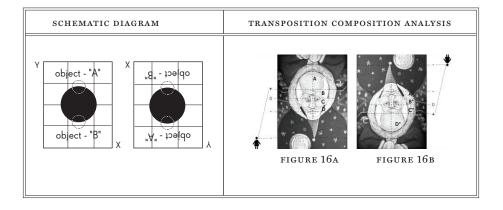
Permission and drawing by Yu-Jia Tan, 2010

TRANSPOSITION

This refers to objects maintaining their original shapes in the optical illusion, while the direction and angle of the objects change. The change methods include displacement, transposition, angular transformation, rotation of angular direction, and the composition often has symmetry. As shown in table 6, figure 16A is a sorcerer holding a crystal ball in his hand. The composition includes a large forehead (A), raised eyebrows (B), eyes looking downward (C) and an upturned mustache (D). However, after a 180° flip, as shown in figure 16B, the image transforms into a Santa Claus image making fists with both hands. The large forehead (A) is turned into a jaw (D"), the raised eyebrows (B) are turned into a dropping mustache (C"), the eyes looking downward (C) are turned into eyes looking up (B") and the upturned mustache (D) is turned into Crescent eyebrows (A").

table 6, figure 16. below Transposition composition analysis

Permission and drawing by Rou-Yu Lin, 2010



CONCLUSIONS

In addition to visual aesthetic appreciation, optical illusions teach about the cognitive process of how viewers see. The composition has important meaning in graphic design; it increases the processing efficiency of viewers in information reception, and promotes visual effects (Lin, 2004). For education and practicing designers, a specific

optical illusion design method is helpful to improve design effects. The composition method of optical illusion design, as proposed by this study, uses coordinate axes tools to define four specific composition methods, according to placement, direction and shape combinations of objects through:

1	separation,
2	tangency,
3	superposition and
4	transposition.

This study has three points differing from previous optical illusion design studies:

- a content analysis method is used, where theory development and optical illusion design are mutually validated; and objective, systematic and quantitative optical illusion design aids are developed from published theories;
- 2 _____ the specific operational definition of optical illusion design is put forward using the deduced design aids in order to establish design rules; and
- 3 ______ validation is carried out repeatedly using qualitative (literature content analysis) and quantized research methods.

The composition method, put forward from the angle of design practice, can be used as reference for design teaching and for designers creating graphic designs.

Future studies can discuss design implementation and viewing angles. From design implementation, the developed composition method can be applied practically in the creation of optical illusion design; checking the validity of the composition method. To research the relation between viewers' cognition and preference caused by different optical illusions seen from the angle of viewers,

allows designers to follow the criteria during creation, thus, remedying the bias errors resulting from designers' intuitive designs.

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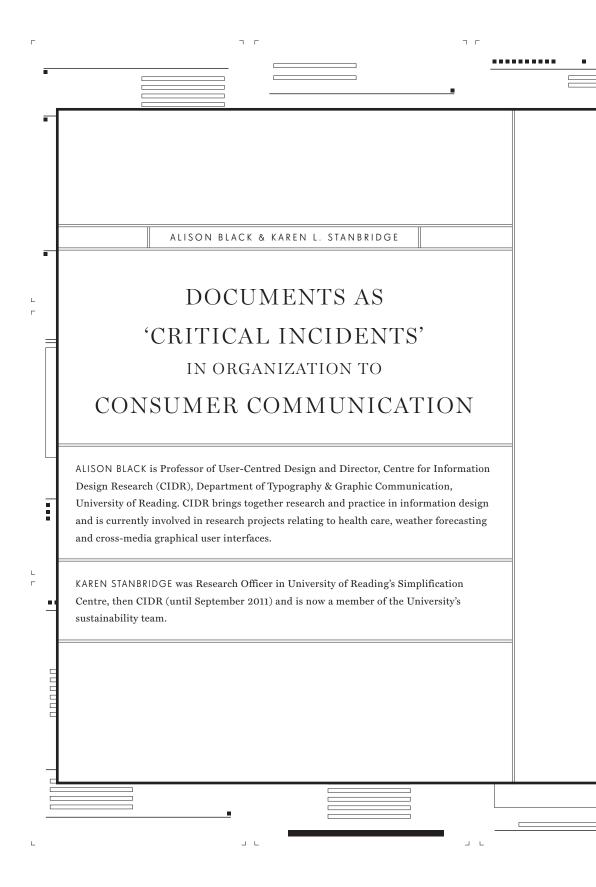
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ABSTRACT

A diary study tracked the paper documents received by nine UK informants over one month. Informants gave simple ratings of individual documents' attractiveness and the ease of understanding them; more detailed reactions to the documents were gathered through informant diaries and follow-up interviews. The detailed reactions extended beyond the feedback gathered through the rating task. Informants showed sensitivity to the content, language, design and circumstances of receipt of documents, with indications that they developed opinions of originating organizations based on their experience of using their documents. Documents that failed to provide all the information needed, that failed to make their intentions clear (or obscured their intentions) or that were perceived as miss-targeted received negative comment. Repeat experiences of receiving either well- or poorly-conceived documents strengthened informant reactions to individual originating organizations. The paper concludes with recommendations for steps document originators, writers and designers need to take to prepare documents that enhance organization to consumer communication. We recommend that organizations evaluate and act on consumers' reactions to their documents, beyond user testing in document development or scorecard ratings in use.

J L

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INTRODUCTION

Despite an increase in on-line communications between organizations and consumers, paper documents, such as letters, account statements, bills, instructions and marketing material are still an important part of organizational communication. There is evidence that much on-line customer communication goes unread (Porter and Whitcomb, 2005; Wainer et al. 2011; Zviran et al. 2006). Many consumers prefer using paper to on-line documents (Liu, 2005; Szostek, 2011) and a substantial minority still does not have access to computers to read documents on-line (in the UK, for example, 23% of the population (ONS, 2011)). Consequently, when an organization needs to capture the attention of a consumer, a paper document remains a viable option.

Although rarely mentioned in discussions of the relationship between organizations and their customers, document-based interactions could be described as 'critical incidents' (Bitner, Booms and Tetreault, 1990) in that they have the potential to contribute either positively or negatively to consumers' perceptions of the organization and to consumers' ensuing behavior (Gremler, 2004). Some organizations focus considerable effort on the content and design of documents they send to customers, using research with potential document users to evaluate the usability of their documents and to motivate revisions. Some of such design projects are reported in information design publications (for example, Schriver, 1997; the contributions to conference publications, such as Duffy and Waller (1985) and Easterby and Zwaga (1984); the work of the Communication Research Institute in Australia, summarized by Sless, 2008). However there is little data regarding customer response to documents, experienced as part of everyday life.

Given the cost of materials and production and the overhead of mailing compared to relatively cheap dissemination via email, paper documents are an expensive alternative to on-line communication. Consequently it is worthwhile examining consumers' reactions to the documents they receive, to gain insight into their effectiveness beyond feedback that can be gathered through user- or market-testing.

In this paper we report a focused study of UK consumers' reactions to the paper documents they received or used over a period of one month. The study allowed investigation of consumers' perceptions of the documents themselves and of the organizations sending them. From this we can derive pointers for document originators, writers and designers on how documents might be improved to increase their effectiveness, and to contribute positively to the relationship between consumer and organization.

RESEARCH METHOD

Method Rationale

The diary technique has a tradition in behavioral sciences, for example in psychology (Norman, 1981; Bolger et al. 2003) and human computer interaction (Palen and Saltzman, 2002; Rieman, 1993). In our study informants collected and commented on documents they had received or used followed by an interview in which researchers asked questions to augment informants' (sometimes brief) diary notes. The method allowed study informants to set the agenda for discussion through their own reactions to the documents, although it also had the disadvantage of limited control over the specific documents included or excluded from the diaries.

1 Succeeded by Centre for Information Design Research

Method detail

2 Initially there had been 10 informants in the study but one gathered more than twice the number of documents collected by most others and, at interview, described his profession as technical communication. Since he appeared either to have been exceptional in the quantity of documents he had received or to have used different criteria from other informants in logging his documents, his data were excluded from the analysis.

Nine informants (four men and five women, age range 34-67), recruited from the University of Reading's Simplification Centre¹ volunteer panel, kept a record of the personal documents that they received or used over one month.2 Documents could have been received by post, been handed to them or collected by them, or could have already been in their possession. For confidentiality, informants were advised not to include documents carrying sensitive personal details, such as bank statements, or documents relating to their employment. Informants were also asked to exclude documents they considered junk mail, in order to limit inclusion of documents from organizations with which they had no relationship (the definition of 'junk mail' was left to the informant to judge).

For the diary, informants kept a record of

I ______ how each document was received and/or used

2 _____ their normal course of action with such a document, had they not been collecting it for the study

3 _____ their rating of the document on two five-step rating scales for attractiveness and how easy the document was to understand

4 _____ any comments they had about the document (this was kept open deliberately to allow informants to generate their own responses).

At the end of the month informants attended an interview where their diary was used to prompt discussion. The interviews were audio recorded and informants' comments about the documents were combined with those from their diaries and transcribed, forming the basis for the qualitative analysis below.

RESULTS

DESCRIPTIVE ANALYSIS OF THE NUMBER OF DOCUMENTS LOGGED AND OF REACTIONS TO THEM

Number of Documents Logged

Informants logged and brought to interview between 10 and 26 documents (mean 19). Overall 174 documents were included in the analysis, including 11 duplicates (brought in by more than one informant, or received twice by a single informant). Some documents originated as combined packs of letters and enclosures. These were separated for analysis of the number and types of documents received.

Most documents (162, 93%) were received by post; one was already in the possession of the informant; two were collected from public locations; five were received in person; and four

came with a purchased product (instructions or guarantees).

The overall number of documents collected per person may appear low, particularly the number received by post. However, the instruction to exclude documents with personal or financial information and junk mail reduced the overall number, and there may have been some omissions in informants' records.

The types of documents informants collected are shown in Table 1. Financial organizations were the dominant source of documents (34.4%), with national and local government and utilities representing 15.5% and 14.4% respectively. The balance comprised documents mainly from retail, charity or health provider sources.

table 1. The type, number and percentage of documents

collected by informants

TYPE OF DOCUMENT	NUMBER	PERCENTAGE
Leaftlet/Booklet	66	37.9
Letter	66	37.9
Form	18	10.4
Statement/Bill	17	9.8
Information Sheet	3	1.7
Certificate	3	1.7
Legal Agreement	1	0.6
TOTAL	174	100

Informants' overall reaction to documents Informants' ratings of document attractiveness and ease of understanding are shown in TABLE 2. In spite of instructions,

table 2.

Informants' ratings of document/pack attractiveness and ease of use

ATTRACTIVENESS RATING (1, not at all attractive -	EASE OF USE UNDERSTANDING (1 not at all easy - 5 very easy)						
5, very attractive)	UNRATED	1	2	3	4	5	TOTAL
UNRATED	1						1
1	1	5	2	3	1		12
2		4	8	4	10	1	27
3		5	2	11	11	6	35
4		2		4	12	10	28
5					6	20	26
TOTAL	2	16	12	22	40	37	129

some ratings were carried out on document packs rather than the individual documents received. Hence there were 129 ratings rather than 174.

Most documents/packs were considered attractive (49% attractive or very attractive) and easy to understand (60% easy or very easy). There was a trend for documents that were rated as attractive also to be rated as easy to understand, although this was not always the case. Similar correlations between ratings of visual appeal and of usability have been found in ratings of user interfaces (Kurosu and Kashimura, 1995; Tractinsky, 1997). Tractinsky et al. (2000) have suggested that perception of user interface attractiveness may also carry over into actual experience of ease of use.

Informants' Comments On Their Documents
Informants made comments on 130 of the 174 documents they had collected. We did not find a relationship between document ratings and whether it received a comment. Comments ranged from a single sentence to several sentences, expressing different ideas. For example:

"Snobby quality of paper makes it feel professional, so I trust it. Nice positive language. Terms and conditions even OK. It's marketing, but not brash."

"Boring and lack of color, despite logo. [I] need one message to pull me in."

An initial, thematic analysis identified four broad categories of issue raised in the comments: references to the content of a document, to its physical or visual design, the language used or tone of voice of the document and to the context within which the document had been received. Two comments within the overall set did not reference any aspect of using the document, and were excluded from further analysis.

The remaining 128 comments were then analyzed by two separate judges for the references they made to each of the identified categories (the judges reached 89% agreement independently, then classified the remaining comments jointly

through discussion). Table 3 shows the distribution of references (total 646) within each category.

table 3.

Numbers and percentages of references to document content, physical or visual design, language and the context of document receipt

REFERENCE CATEGORY	NUMBER OF REFERENCES ACROSS 128 COMMENTS	PERCENTAGE OF TOTAL REFERENCES
Document content	199	31
Physical or visual design	148	23
Language used/tone	100	15
Context in which document received	199	31
TOTAL	646	100

In order to gain further understanding of the nature of references the two judges classified the references, according to whether their content was positive, neutral or negative, or mixed (see TABLE 4).

table 4.

References in each category rated according to whether they expressed positive or negative sentiment

- 3 For brevity we refer to the physical or visual design of documents as 'design' although we are aware that the design of communications involves $decisions\ about\ their$ content and language (Schriver, 1990) and also, the context in which they are sent.
- 4 The data were unsuitable for statistical analysis, for example using chi-squared due to low $numbers\ in\ some\ of\ the$ data cells.

	PERCENTAGE OF REFERENCES IN EACH CATEGORY				
REFERENCE RATINGS	CONTENT (N=199)	LANGUAGE (N=100)	DESIGN (N=148)	CONTEXT (N =199)	
Positive	39	53	34	26	
Neutral	8	8	11	4	
Mixed	5	8	7	7	
Negative	48	31	48	63	
TOTAL	100	100	100	100	

Different balances of positive and negative references were observed across categories, with the language category including more positive (53%) than negative references (31%). The other three categories included more negative than positive references, with the balance particularly striking in the context category (63% negative to 26% positive). The content and design3 categories both showed 48% negative references compared to 39% and 34% positive references, respectively.4

The high proportion of negative comments may seem to contradict informants' initial positive document ratings (TABLE 2). However the rating and commenting tasks differed. In rating, people were asked for overall judgments on document attractiveness and ease of understanding; in commenting they had free range to address any aspect of their experience of a document. Much of the negative commentary related to content and the context of document receipt. Note also the frequently observed asymmetry in people's evaluation judgments, with a tendency to positive judgments (Markus and Zajonc, 1985; Peeters and Czapinski, 1990; Van Dijk et al., 2003).

QUALITATIVE ANALYSIS WITHIN EACH REFERENCE CATEGORY

Within each broad category (content, design, language, context), we grouped the references according to the issues raised. The groups were developed by one researcher and then modified following discussion with a second to ensure unambiguous grouping and coverage.

References to Document Content

Table 5 shows the themes informants raised within the overall category 'Content.' Informant references focused, particularly, on the comprehensiveness of the documents (32% of references). Examples, selected by the two judges, of both positive and negative expressions of each theme are shown in TABLE 5 (and similarly for the following TABLES 6-8).

Looking at the documents on which comments were made, it was possible to isolate the impact of document content. For example, there are similarities in structure across the two-column documents in Figure 1.14 (an update of bank terms and conditions), however, is arguably more attractive and legible than the patient information leaflet in 1B, and yet it received negative comment because it could be understood only by reference to a fuller statement of the bank's customer agreement (available via the internet). In contrast, despite well-documented concerns regarding the design of patient information leaflets (see for example, Dickinson et

table 5.

Themes expressed regarding document content, with positive and negative examples of each theme and percentages for each theme of all references relating to content (199)

THEME WITHIN CATEGORY	EXAMPLE POSITIVE & NEGATIVE REFERENCES FROM EACH THEME	% OF TOTAL REFERENCES TO CONTENT
1 Comprehensiveness	Pos: "Clear and simple language with full ingredients, instructions and possible side effects." Neg: "Useless as I don't have the original T&Cs in my head. They should instead have provided the changes highlighted on the original."	32
2 Accuracy, errors & omissions	Pos: "Very clear, gives details of who to contact in the event of a query." Neg: "This is difficult and I wish they'd put the name of the insurance policy and company as well as the policy reference."	19
3 Quantity of information	Pos: "Gives all needed information without providing too much." Neg: "Feel like I should read and absorb section 3 as it's been given but would I ever find the time? Wish they hadn't given me so much information."	18
4 Topic complexity	Pos: "Tells me exactly what to do and why so I don't have to think or feel stressed." Neg: "It's quite confusing in a way, what's not covered, and what is covered, and meanings of words, it's all bitty and mixed up together somehow."	12
5 Summary included	No positive comment Neg: "What I need them to do is cut to the chase a bit quicker. The bottom line, what everybody wants to know is, 'Is there a problem paying? Is there going to be any difficulty? And is there any action I should take?"	4







figure 1.

The two-column layouts in \mathbf{a} and \mathbf{b} received very different comments (\mathbf{a} negative and \mathbf{b} positive) based on document content.

1b



al. 2010), and a relatively low rating for document attractiveness, the leaflet in ${\tt l}{\tt B}$ received positive comments for its comprehensiveness.

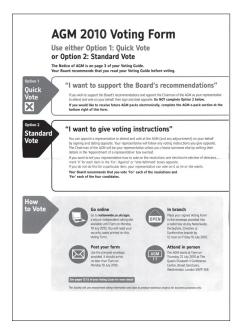
Long documents and those presenting complex topics received negative comment, particularly when relating to legal, financial and tax matters. However, informants understood that complexity was sometimes necessary, and reserved criticism for complexity they perceived as unnecessary. For example, the voting form for a financial service provider in 2A received negative comments whereas the tax exemption document

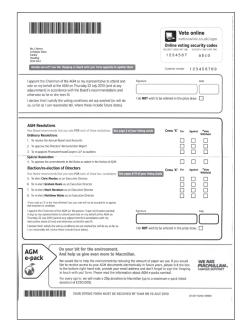
figure 2. facing page and following page

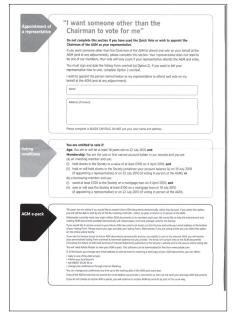
Lengthy content and perceived complexity attracted negative comment. The form in **b** is, arguably, more demanding to complete than **a** but was not viewed negatively, partly because it appeared concise and relevant to the informant who collected it.

2a

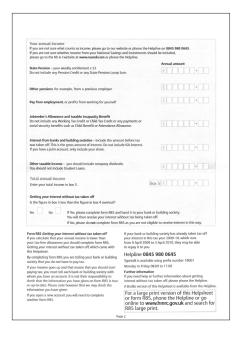










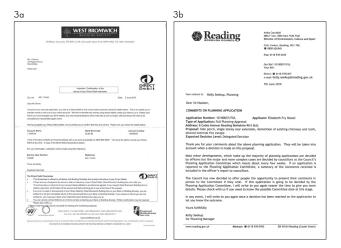


in FIGURE 2B, which was comparatively more demanding to complete, received positive comment.

Although only four references explicitly stated the need for an orienting summary of document content, this theme lay behind many comments. Most documents (including those shown in FIGURES 1 and 2) followed good practice (Reddish, Felker and Rose, 1981; 1985; Williams and Spyridakis, 1992) by incorporating an organizing header and paragraph, stating the purpose of the document. However, these may not have attracted readers' attention, particularly in the context of the forms in figure 2, where user behavior is typically to start filling in the form rather than read contextual information (Frohlich, 1986; Jansen and Steehouder, 2001). Two informants commented that they would have discarded documents without reading them, had they not been participating in the study, but then found the documents required their attention. Lack of introduction to content was raised in relation to relatively routine documents, such as the letters shown in figure 3, where informants saw a need for explicit guidance

figure 3.

Even in relatively routine documents, such as those presented, readers seek explicit orientation about how they should respond to the communication.





to read, respond, file etc. beyond headings telling them document content was important (3A and c).

References to the Language & Tone of Voice of Documents TABLE 6 shows the themes of references relating to language and tone of voice. There were fewer references to language (100) than to the other categories (mean 182) and the balance of references in this category was distinctive for its positive tendency compared to the other categories (see TABLE 4). Within the overall category, most comments related to

THEME WITHIN DOCUMENT LANGUAGE CATEGORY	EXAMPLE POSITIVE & NEGATIVE REFERENCES FROM EACH THEME	% OF TOTAL REFERENCES RELATING TO LANGUAGE THEME
1 Clarity of explanation	Pos: "It was easy to understand and read. The leaflet was bright and clear, trying to sell travel insurance." Neg: "So much of this is 'positive spin' it was difficult to understand."	69
2 Plain words & grammar	Pos: 'Absolutely short, clear and to the point, you can't possibly get the wrong idea. It doesn't even have full line sentences, which is clever actually." Neg: "What I took final exception to was 'avoid skills fade.' You can't just fool around with the language like that."	16
3 Tone & style of language	Pos: ""Time is running out' caught my eye. The language is simple and caring and polite." Neg: "Patronising found all the 'simply do' language irritating. What if I don't find doing it simple? Then you are saying I'm stupid?"	15

table 6.

Themes expressed regarding document language, with positive and negative examples of each theme, and percentages for each theme of all of references relating to language (100)

clarity of explanation, particularly the use of technical terms and language forms, and their impact on comprehension. Obscurely worded terms and conditions (often on the reverse side of invoices or statements) were frequently singled out for comment (although in reality, only read under duress). FIGURE 4A shows a typical example with 4B illustrating an extract, written in unadulterated legal language.

figure 4.

Terms and conditions (a) and an extracted clause (b), typical of those that attracted negative comment from informants.



4b

34. No forbearance, delay or indulgence by either party in enforcing the provisions of this Agreement shall prejudice or restrict the rights of the party, nor shall any waiver of its rights in relation to a breach of this Agreement operate as a waiver of any subsequent breach and no right, power or remedy given to or reserved to either party under this Agreement is exclusive of any other right, power or remedy available to that party and each such right, power or remedy shall be cumulative

In contrast to the negative comments on obscure language, informants commented positively when language was clear (jargon-free and simply structured), particularly when they were aware of an effort to clarify necessarily technical language. In the financial report in FIGURE 5A technical terms in the text are highlighted (see detail in 5B) and a glossary of these terms is provided 5c, detail in 5D). While highlighting so many words might disrupt fluent reading (Brian, 1989), and while contractual language requires more adaptation than definitions of terms to improve comprehension (Masson and Waldron, 1994), the recipient of this document felt the document originator had taken positive steps to help the reader. Similarly, the contractual detail on the reverse of

Investing the Scheme's money. An update on the continuing effects of the credit crunch and investment volatility on the Scheme's assets.

This section is of particular relevance to active, deferred and pensioner members.

	Royal	London	JP Morgan Total			n Total Scheme	
Performance v Benchmark	P	В	P	В	P	В	
3 months	0.7%	-0.2%	3.8%	3.4%	1.9%	1.2%	
1 year	7.8%	5.5%	22.3%	23.7%	13.0%	12.9%	
3 year			-0.5% p.a.	0.3% p.a	1.9% p.a.	2.6% p.a.	

5e

Understanding your

- ▶ Opening balance: The

Paying into your account. Taking money out of

Accessing your account.

5b

As the Scheme is a final salary pension scheme, your pension is not affected directly by the performance of the assets. The Trustees are required to undertake an actuarial valuation every three years and if the assets are insufficient to cover the liabilities then the Company is required to make up any shortfall. The effect of the assets not performing as expected is to increase the requirements on the Company to pay additional contributions and while this can increase the costs of the Scheme to the Company, it does not directly affect the pension that you will be paid.

Glossary of pension terms

5d

Actuarial valuation

A measurement of the Scheme's assets and liabilities by a Scheme Actuary to work out how much money needs to be paid into the Scheme to ensure that pensions can be paid in the future. An actuarial valuation must be carried out at least every three years.

figure 5. facing page

These extracts from a financial report show full page with highlighted technical terms (a) and detail (b) & accompanying glossary (c) and detail (d); contractual detail on the reverse side of a bank statement (e).

the bank statement shown in 5E received positive comment for its clarity.

A second theme within the comments on language related to the appropriateness of both vocabulary and tone of voice. The rail-card renewal leaflet in Figure 6 was among items criticized for their tone of voice, with comments that it patronised by its exhortation to 'Simply complete the attached form...'. The leaflet was also criticized for its encouragement of senior citizens to use an on-line renewal process⁵ and the cramped design of the application form. Underlying these negative reactions may have been a perception of, overall, poor targeting of the leaflet's tone of voice

figure 6.

There was negative response to language interpreted as patronising or miss-targeted (as in this rail card renewal document).





87130104.2	Declaration
Girson 43 Mayle Drive Earley READING RGS SAU	Before applieg this disclaration, it is important that you have read, understing agree to the Conditions shown in this letter, together with the factions filed Cut of Contings, Copies of the factional that Conditions of Contings are availabled in the continue of the Condition of the Condition of Contings are availabled context School that I found in the orbit of a validation of the Condition of
	I have need, understood and agree to the Conditions shown in this letter, I contribe distalls I have provided an acrest and I am aged 60 years or over.
Yeary of the details above are incurrent, please amond below.	Signature
fertane	
Street	0 to 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
coner Coner	On behalf of the Train Companies, ATDC Ltd collects and processes partirization for the purpose of sales analysis and market research, ATD registered in the IKI under the Sale Protection Act 1956 as a Sale Controller
<u>- 000000000000</u>	contact you when your card it does to expiry. From time to time your personal details may be used to send you.
	information as described below.
Marine III	If you do NOT wish to receive such information please lick the relevant to
	I do NOT want to receive: by Wall by Ereal by SMS
tore	Related internation and others
rise	this surgery office and other self-middle derives
I's say being green. Ernal is the med environmentally blendy way for us to	Trief party offers of goods
communicate with you So please fill in your permanent entail address for special often and spokes.	station -
	FOR ISSUING OFFICE USE ONLY
House Committee	See Sebard Se
Desguifor	Delte of Applications
Al fire engines Det fire engines Detect	Card Dayly Date:
	DationAgency NLE or Code No.
kt is enployment	Status or York April Starry
that is your scoting falcant Number!	
Doiny date of existing flatours	
New Yorky Senior Reduceds have you held in the past?	
	Please remember to also complete the "Recolpt" section on this leafler
This section must be filled in by the innaine station/and associated Toront Report.	Notard Sc. Control Control
Senior Railcard Receipt	States or Stand Agent Stane
This form with as a monitor of purchase for your Senior Raticans, and must be above in the exert of a replacement being requested. You should have this receipt at a separate place	
Temper Select Relicate	
Salest Solery Surve	
	www.senior-railcard.co.u

5 This criticism, while representing a personal point of view, was possibly unjustified, given growing access to the internet among senior citizens.

THEME WITHIN DOCUMENT DESIGN CATEGORY	EXAMPLE POSITIVE & NEGATIVE REFERENCES FROM EACH THEME	% OF TOTAL REFERENCES RELATING TO DESIGN THEME
1 General attributes, size, paper, orientation	Pos: "Only 1 page—brilliant!" Neg: 'A4 landscape 4 columns makes reading order unclear, especially when the pages are open to A3."	22
2 Layout, use of space	Pos: "Lots of space around the text so not overwhelming." Neg: "Too glossy and not organized. Cheap and tacky, over busy."	26
3 Headings & pointers	Pos: "Nice and clear, bold headings and symbols/pictures used were good." Neg: "[I] struggled to find information about what to do if not reinvesting — it was hidden as an untitled sub section."	21
4 Key information highlighted	Pos: "The letter was clear and the design emphasized key information." Neg: "Claim your £10 voucher' [is printed] really bold, and 'you only pay £3' [is printed] really bold, and then it's got the small print [where you see] it's 29% interest. It's not highlighted."	24
5 Use of diagrams & images	Pos: "You can't go wrong. It has a front view and back view, remarkably well labeled and useful arrows. Amazingly clear for idiots." Neg: "All these graphs and tables and so on. I think if you're not really financially minded, as I am, you'll find it quite difficult."	11
6 Legibility	Pos: "Large sans serif type — clear. Good use of capitals for important info." Neg: "I've just read the bold print. I have had trouble with it because the print all looks the same. This is really tiny on the back, ridiculous and it's grey again!"	24
7 Color choices	Pos: "Very attractive, colorful and clear." Neg: "It was difficultto follow the bands along somehowI'm not sureit wouldn't give you seizures but it sort of flickers somehow. I don't know if it's the green."	20

table 7.

Themes expressed regarding document design, with positive and negative examples of each theme, and percentages for each theme of all references relating to design (148)

(as well as an incoherent approach to visual design). Humor in advertising can backfire if it does not relate to the product being promoted (Fugate, 1998), and may have been seen here as a distraction from a direct renewal transaction. As will be seen in the next section, FIGURE 7A, renewal forms can be appealing without whimsy.

References to the Physical or Visual Design of Documents
TABLE 7 shows the themes of references within the
overall category 'Design.' Comments reflected a spread of
themes, from high-level aspects of document structure
(for example, layout and use of space, the highlighting of key
information) to the detail of typeface legibility.

Examination of the documents targeted in some of these comments illustrates the combined aesthetic and functional impact of document design and its capacity either to facilitate interaction between the initiating organization and the user or, conversely, to deliver a negative experience. Consider, for example, two contrasting A4 documents, the subscription

figure 7. this page and following pages

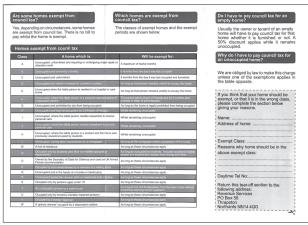
Examples of documents where design facilitated navigation through multiple elements of information (a) and interactions with it (c) or where design compromised legibility and interaction (b).

National Trust	Membership Department PO Box 39, Warrington WAS 7VID Telephone 0644 800 1895 Miniorm 0844 800 4410 www.nationaltrust.org.uk
Mr. J Simon	June 2010
43 Maple Drive Earley Reading Rigs 6AU	Membership Number: 314 675 455
0040861 / 705 / 00149	
կերկցվելիկերելիցրե -իվ-	
Dear Mr Simon	
Enjoying your National Trust membership is time well spent. And with so many places to get away from it all, it's money we	rell spent.
I am delighted to enclose your new National Trust membership card(s).	
There are hundreds of places to visit, so you can fill your days out with the fact that the cost has already been covered. At a time when many membership offers you countiess opportunities to take some important ti	
To help you plan your days out, you will find details of all our properties year at www.nationaltrust.org.uk	
As you pay by Direct Debit, all you have to do to enjoy another 12 n card(s).	, , , , , , , , , , , , , , , , , , , ,
We have introduced a new design that enables the cards to be scanned membership cardial to the visitor reception staff as you usually would, your card, others will not. The new process arms to reduce quisues and improve corr searches to you and better seable you so cond www.nationaturus.org.uk/coannablemembershipcards for further defails.	During the current pilot stage, some properties will scan help us understand more about our visitors so that we can thus. In support, our valuable work, Please visit.
Thank you for continuing to help us protect our national heritage.	
Yours sincerely,	
Mr Kervin Merrell Head of Membership and Supporter Services	
President, 1981 The Prince Of Fildes, Originals Simon Jordon, Dipply Chalmers Sir Laufe Hagnes, Director Co.	rend Darre Finns Reported, DDE, Registered Crarle Resident (2004)
Are your details correct?	

Your membership renewal







renewal form in Figure 7A and the local tax form in 7B. While the form in 7A presents the reader with multiple information components (news about the organization, an invoice, a rates table, a direct debit form), the document elicited positive comments on its organization and succinctness. In contrast, the local tax exemption form in 7B presented simpler content (fewer information components) than 7A but received negative comments.

Both documents in Figure 7 used color to signal document structure. In 7A color supported user interactions, by separating information components. However in 7B color

	Do you want to keep your Certificate invested for a further term of the same length at the guaranteed rates set out in the endosole dister? If you would like to keep the full amount invested, then you don't need to send us anything - your Certificate will automatically earn the guaranteed rates in the endosole dister.					
	If you would like to keep part in a different term and/or cash 'Can I keep only part of a Cert	h in, please co	implete sect	ion 5 and/or 6. Fo	ne rest, go straig or more informa	ht to section 6. To reinvest tion, see the section
5	reinvest in a new Certificate of a	Hease reinvest:				
	different term or type	full value	er £		p into a	year Index-linked
	If you choose to reinvest, the rates of interest shown in the enclosed letter are net	full value	or £		p into a	year Indox-linked
	guaranteed. We will give you the bour(s) available on the day of your reisonstment.	full value	or £		p into a	year fixed Interest
	Please indicate the amount for mineralment, the term and type of	full value	or f.		p into a	year Rixed Interest
	Annectment, the som and type or Certificate.	VWe have read	and accept the t	erms and conditions for	Fixed Interest Savinos	Certificates dated 1st March 2010 and
	Please remember to sign in section	Index-linked Sa 7 Inclove	vings Certificates	dated 18 January 2010	, as applicable.	
6	cash in your	Please cash in:	1016016	167-257-071	CANAL O	
٠	Certificate	full value	part	if you choose 'pa	nt', and leave section !	blank, the remainder will stay investo
	Do you want to sosh in the full value or part of your			for a further term. - If you choose 'pa	nt', and want to reinve	st the remainder in a different term or
	Gestione?	Ye cook in cook	d a Coefficient or	type, fill in section oter the Certificate Num		he coded is how
	Certificate		a a certainam e	6	ACT AND DIS BROWN D	our carrier in ourse.
	number	If you are cashis capital together	with the interes	ertificate, and keeping p t it has earned. As a res nore than you requested	ult we may not be able	the amount repaid will be made up of a to give you the exact amount. The
	Rear infeatr year perferred			ciety (see recommend th		
	method of payment. Fleeter bell ut here velo vou	direct credit to I	sank/building so	Dety (we recommend th	is method) w	arrant (like a cheque)
	wast-payment to be made to account name					
	Nysu close-direct code above, bank/building complete the account details bank/building society					
	opposite and we will send your payment directly to dis branch/town/					
	accent. city					
	account no				sert	code
	Nyou prefer to be positify womant (like a cheque), we cold no					
	will send it to the address in section 4 unless you enter a					
	different address here. name					
	address					
	town/city					
		polaciole				
	county				posts	code
7	Please remember to sign in section		or Money house who	and the section of the sec	on Continue to cont	on St. and not to keep your current
′	your signature(s)	Certificate inves	ted for a further	term, we will give you t	the Issue(s) available o	n the day of your reinvestment.
	heldes must sign. signature(s) If the Grafficates are held by a					ine Carlot Walley Walley
	child of 7 or over the child must sign. For children under 7, g					MINE
	porent or guardian must sign.					ate
						Elizabeth proper

compromised legibility, particularly where a relatively saturated hue was used in a 'zebra' table format. 6 As a third example, the reinvestment form in 7c also uses color (coincidentally, all three document use green) to differentiate instructions from question fields. While arguably a more demanding form to complete than the forms in 7A and B, the document attracted positive comment because its design revealed structure and guided users, rather than complicating their task.

As with the comments on document summaries discussed previously (see pages 258 and 259), and concern that important detail might be lost through use of technical language, informants focused on the need for key messages in documents to be signalled clearly. Densely packed, unstructured information was understood as serving statutory requirements for an organization, but seen as showing little consideration of the user. For example, figure 8 shows two letters from companies to their share-holders: 8A a notification of potential changes in payment of dividends from which the

6 Even when welldesigned there is only weak evidence that $zebra\ formats\ increase$ the usability of tables (Enders, 2007).



	MAY WISH TO TAKE ACTION
	Centraca Comitiva sic Registered Cifice Millimens, Milliment Placet, Window, Exercise to EA FOOD Registered to To I project and Wildea
Dear Shareholder	
Paying dividends directly to y	rour bank account.
payments paid directly to your be	nd psyments by cheque. However, you could benefit from heving future dividend enk or building society account. Over 370,000 Centrice shareholders already do y by saving money. Other benefits include:
	is quickly - it's in your bank account on the payment date;
evold postel delays;	and o need to take your dividend chaque to your bank.
	by your account, a tax voucher will be mailed to you each March, showing both
dividend payments made in that	
Simply complete the form below, postage is free.	return it to Equiniti at the address on the form and we will take care of the rest,
a Jansi	
Grant Dawson General Counsel & Company Se	coretary.
Please complete the form	below.
	Please comolete in BLACK INK
+ Centrica plo	123,7-096-S
Step 1 Sort Code	
Step 2 Account Number	
Step 3 Building Society Reference or Roll Number (If applicable)	Please branch will latter midda, all dikkinsk or intensif hat one hors love to their browne opposite to make in respect of any advant half in Careton gift in the above restricted best or chaldle, would, or it is such other branch of the oppositions as of the company of the co
Step 4 All the Registered Holders (or, where applicable, exercises or administrational MUST size.	Bobilly in respect of such shibbinds or other monites.

8b

recipient could opt out; 8B an appeal to shareholders to receive their dividend by direct payment, rather than as a check. In 8A, the relatively undifferentiated design of the text does not highlight the opt-out option; in 8B, structured text design, including a bullet-pointed listing of advantages, emphasizes the case for the recipient changing to direct payment (which has efficiencies for the organization).

It might be that both documents would perform adequately in assessment of their readability. However informants were aware that document performance was determined by design as well as language.

REFERENCES RELATING TO THE CONTEXT IN WHICH DOCUMENTS WERE RECEIVED

Table 8 shows the themes of references relating to the context in which documents were received or used. In this category, there were substantially more negative comments than positive,

figure 8. above

Informants noted the potential of relatively undifferentiated text structure to obscure the details of document content (see a) compared to structured documents (such as b)

table 8.

Themes expressed regarding the context in which informants received documents, with positive and negative examples of each theme and percentages for each theme of all references relating to context (199)

THEME WITHIN DOCUMENT CONTEXT CATEGORY	EXAMPLE POSITIVE AND NEGATIVE REFERENCES FROM EACH THEME	% OF TOTAL REFERENCES RELATING TO CONTEXT THEME
1 Targeting of message	Pos: "Useful to get this as I need to set up broadband/ phoneline etc." Neg: "5 separate things in the envelope. I just keep my money there, I'm not interested in all this."	22
2 Assumptions about sender motive	Pos: "They traced me through [my] Advantage Card - another benefit of using it. A nice letter. It's a warning about a product." Neg: "They continually send me letters about loans/ insurance even though I've told them I'm not interested I've lost respect for the company."	26
3 Trust in sender	Pos: "No small print so feels honest." Neg: "Their [charity] correspondence is looking increasingly corporate and I am concerned at unnecessary expense of a full color image on the reverse. Good to see FSC info at bottom but I would prefer a less costly letter."	21
4 Previous experiences with sender	Pos: "This is about the third one of these [I have] had. It's short and straight to the point, which is good." Neg: "The organization tends to saturate [me] with mailings, therefore I never tend to read."	24

most relating to the informants' views of the sender organization. Key themes emerging within this category were a loss of trust in the sender, resulting from receipt of repeat information and a general sensitivity to communications that were poorly targeted.

At the core of the comments was informants' assessment of whether an organization initiating a communication had considered their needs. Informants expressed irritation with use of their contact details for cross-selling, whether this was envelopes carrying a targeted communication, packed with additional communications (for example, bank statements accompanied by marketing for additional services) or repeated, poorly-targeted communications. One informant had written to ask a sender organization to stop, out of concern for wasted resources. However, despite predominantly negative comments, one reported a positive experience of receiving unsolicited information about broadband at the time of making a decision to set up a connection. (This communication may have been less random than the recipient believed, possibly stemming from information gathered by the sender organization, such as a change of address.)

The quotations in Table 8 show extrapolations from receipt of a communication to an opinion of the sender organization. Note the contrast under '2 Assumptions about sender motive' between informant opinions arising from well- and poorly-targeted information.

Beyond the direct response to poor communication targeting, informants were sensitive to the cost and perceived waste of repeated mailing. This concern is reflected particularly in two informants' comments on color leaflets from charities (see FIGURE 9A), which raised doubts about the integrity of the charities' communication strategy (see TABLE 8(3)). There was no equivalent response to color leaflets from other organizations (see FIGURE 9B). Sargeant et al. (2008) have described in detail consumers' negative perception of direct mailing by charities. Analysis shows it delivers return on investment, despite popular coverage implying it is an extravagance.

9a



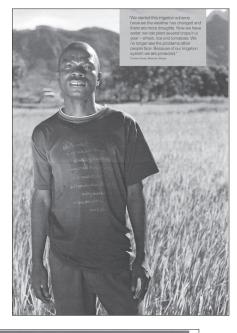


figure 9.

Reactions to design characteristics, such as use of color, were mediated by informants' understanding of the sender organization. Use of color in charity mailings (such as a) received negative comment, but not in retail promotions (such as **b**, next page).

9b



ACTIONS FOLLOWING RECEIPT OF DOCUMENTS

Informants' records and descriptions at interview of how they would have dealt with documents had they not been participating in the study were clustered according to theme (see TABLE 9). The table shows, broadly, increasing levels of engagement, ranging from a rapid decision to dispose of a document, through putting off dealing with it, to skim reading or

ACTION FOLLOWING RECEIPT OF DOCUMENT		
1 Not read/bin	"I just see the envelope and it goes in the bin."	
2 Put off reading for later	"[There's too much to read.] I'll keep it in case I need it. They say you should read it carefully."	
3 Look for key/relevant information — skim read	"We are not sure what to do with it – where is the form to complete?"	
4 Read in detail	"This is more complex than it needs to be. They explain options I don't have and they should know."	
5 Contact sender or consult someone else for clarification	"[I] was spinning from the start of looking at itI read it because I wanted to be sure, and rang to double check it was the right policy."	
6 Complete and return/take up offer	"This is difficult and I must spend more time on to complete it before the deadline. Its difficult not to keep putting it off."	
7 Store/carry document	"Tremendously helpful this. Gives the contact details in case I need to contact them about anything."	
8 Share the document with others who might be interested	"The magazine can be passed on so it doesn't seem like a waste of resources."	

table 9.

Categorization of informants' comments on their actions following receipt of a document

engaging with it in detail. This set of behaviors overlaps with that elicited by Harper and Shatwell (2002) in a survey of the use of paper mail in UK households.

Olson (1994, 273-5) describes literacy as both a cognitive ability (being able to understand and respond to the text) and a social ability (being able to understand the intentions of the author and how those intentions should be applied to one's own

circumstances). Our informants showed themselves skilled in both, drawing on past experience with organizations and the overall appearance of the document they are considering (its 'supra-textual' design (Kostelnick, 1996)), often before even considering its content. As mentioned previously (see page 258) however, sometimes cues were misread, with the risk of informants disposing of documents that they needed to retain.

DISCUSSION

As consumers of documents, all readers are likely to recognize some of the experiences and reactions described in this research. What, therefore, can document originators, writers and designers apply to practice from this drawing together of individual experiences? Since our data show more informant comments relating to document content and context of receipt than to document design and language (see TABLE 4), is there any cause for document writers and designers, to be concerned about their contribution to document interactions?

THE CUMULATIVE IMPACT OF CLEAR COMMUNICATION

We have shown consumer responsiveness to clear communication, both in specific documents (see informants' positive comments in TABLES 5, 6 and 7) and cumulatively (see TABLE 8(4)). As the responses to the simple letters in Figures 3 and 8 suggest, no document is too insignificant for writing and design that focuses on end-users' needs. We suggest that clear communication is a worthwhile investment for organizations, both practically, by reducing queries from consumers (see TABLE 9(5)), and as part of developing consumer goodwill (see TABLE 8(2&4)).

THE CUMULATIVE IMPACT OF POORLY TARGETED MAIL

Just as consumers react positively to documents they consider well written, designed and targeted they react negatively to those that are not, particularly when poor communication is a repeated experience. The sensitivity we found among informants to, typically, cross-selling through poorly targeted mailings is not new (James and Li, 1993). In common with other studies (Culnan, 1993; Marimoto and Chang, 2006), informant comments suggested concern about lack of control of direct mail, but we also found concern about waste of recipients' time, waste of resources and an extrapolation from informants' reactions to a negative view of the sender organization (see negative comments in TABLE 8). Our findings suggest that even when organizations aim for efficiency by bundling promotional material with targeted communications, this is not appreciated. However, our data also show that there are occasions when direct mail is on target and may receive a positive response. It could be appropriate, therefore, for document originators to use design to help consumers decide what really requires their attention and reduce the irritation they experience when dealing with direct mail. Such an approach would also be likely to reduce the length (and hence perceived waste) of direct mail documents. This approach runs counter to typical practice and existing research (James and Li, 1993). Only evaluation in real use settings could test its effectiveness.

MAKING DOCUMENT INTENTIONS CLEAR

Our data show that even targeted documents often fail to make their intentions explicit. Given the range of behaviors on receipt of documents (TABLE 9) and the unappealing nature of some document content (see negative comments in TABLE 5), recipients need support in deciding whether or not there is advantage in engaging with document content and acting upon it. Writers and designers need to push their organizations to use the battery of well-documented tools to guide readers, such as carefully crafted summary statements, clear headings and explicit directions to consumers. Lorch and Lorch (1995) have shown the impact of summaries and headings on reading comprehension and recall; Frischknecht and Baker (2011) have reported on the impact of headings on comprehension of business documents; clear document structure is particularly important for comprehension by less sophisticated readers (Meyer and Rice, 1982; McCabe et al. 2006); headings that do

not relate well to the text they signpost can limit comprehension (Loman and Mayer, 1983; Mayer et al. 1984). Although some documents in the study incorporated headings they may not have been effective in orienting readers. Stiff (1993) has noted that many professionals are confident they can take the readers' point of view in document writing and design but that, however well-intentioned they may be, they cannot be sure of their effectiveness without testing.

COMPENSATING FOR LACK OF CONVERSATION

If summary statements, headings and directions are needed when recipients make initial decisions about documents, they are needed equally when 'recipients' become 'readers' and engage with document content. Some researchers describe document use in Gricean terms,7 as a cooperative process in which the organization needs to be relevant, clear, truthful and give the right amount of information (Waller and Delin, 2003). All these are, without doubt, essential. However, our findings confirm those of others (for example, Wright, 1981) that consumers do not necessarily engage in the turn taking that Gricean cooperation implies. They are strategic readers, generally adhering to the principle of least reading (Frohlich, 1986) and looking for document senders to 'cut to the chase' (see comment in TABLE 5(5)). A consequence of strategic reading is that readers are likely to miss information. In the absence of an active co-operator, as they would have in conversation to bring them back to the point, they need a clearly sign-posted document structure. And, when even a clear document structure fails, and to be able to deal with the sometimes very specific circumstances of individual consumers, document readers need a clearly available contact within the sender organization to facilitate a real, voice conversation (see comments quoted in TABLE 5(2) and 9(5 and 7)).

7 Philosopher H.P. Grice (1975) proposed four maxims of spoken conversation: Quality, Quantity, Relation and Manner. Adherence to these maxims by participants in a conversation makes it possible to imply meaning, for example, in jokes, irony and sarcasm, without necessarily being literal.

PROVIDING A COMPLETE INTERACTION

Our data suggest that when recipients choose or have to engage with documents, they expect their effort to be repaid by content that meets their needs concisely and without distraction, for example, from marketing messages (see TABLE 5). Focusing content on the explicit purpose of the document might seem to be a simple, manageable, originator response to this need. However, Sless (1998, 150-1) has described the multi-layered and complex decision-making that often underlies development of document content. In such cases a compromise might be to create clear distinctions between essential and optional content (as for example in the subscription renewal form in FIGURE 7A).

The expressed need for concision presents document originators with a dilemma. Since readers are unlikely to attend to all the detail in a long document, presenting the elements they are most likely to ignore or skim as small print or replacing them with signposts to supplementary web content (as in figure 1A) might seem appropriate. However, since document detail is likely to be consulted in time of difficulty (when a consumer has a query or complaint), design to make access easy seems a better solution than compressing content or syphoning it off from print to the web. Our document sample included examples of clearly presented technical detail, such as the bank statement reverse in figure 5E.

VISUAL DESIGN AS THE SERVANT OF COMMUNICATION

Turning to comments on the physical and visual design of documents, our informants appeared somewhat muted, perhaps reflecting non-designers' lack of awareness of the craft and impact of visual design (Black, 2010). Some design practitioners reflect that when non-designers criticize the design of a document they may identify that the document does not function well but may not be able to say why or may misattribute the cause.⁸ So, for example, the voting form in 2A was criticized for the complexity of its content, although the content might have been simplified by more sympathetic visual design; the document in figure 7B was criticized for poor use of color whereas the document as a whole would have benefited from re-design. Conversely, when design appeared to bring clarity to documents (for example the forms in figure 2B and figures 7A and c and the bank account details in figure 5E), informants

8 Mark Barratt, personal communication.

could pick out appealing details but did not comment on the structural design that supported document function.

The unobtrusive, functional support provided by appropriate visual design is in keeping with a long-standing tradition of typography as a servant to the information it conveys (Kinross, 1992, 22-4). Notwithstanding those who see visual design as a potential means of challenging the reader to new understanding (for example, McVarish (2010)), most typographers would not expect or want a reader to notice their work. The unassuming contribution of good visual design may partly explain the failure of some document originators to invest in it, particularly for items they may consider to be of limited interest to consumers, such as contractual detail.

ASSESSING DOCUMENT PERFORMANCE IN REAL LIFE

Finally, this study reveals some contrasts between initial ratings of document attractiveness and ease of understanding, and detailed reactions to documents. Horn (1999, 21) cites professional designer opinion that the attractiveness of visual design affects what people read, and as discussed, there is some evidence that perception of usability is influenced by visual attractiveness. However, even if there is such a relationship, our research shows that documents that are rated positively for attractiveness and ease of understanding may still confront consumers with problems in use. Document originators and designers may want to consider this finding and its implications for assessing document performance. If document performance is evaluated only by monitoring of consumer opinion (for example, using performance scorecards) this is likely to pick up only high-level assessments, similar to the ratings shown in TABLE 4. In order to gather a full understanding of document performance there is no substitute for detailed investigation of users' opinions of and interactions with documents over time, and in their context of use.

CONCLUSIONS

We began this paper by asserting that the use of a document generated by an organization could be counted as a critical incident in the relationship between an organization and its clients, customers or users. By looking at how documents are received in people's everyday contexts, we have seen both positive and negative reactions to the sender. These reactions stem from practical and emotional evaluations of document content, language, design and the circumstances of receipt. We have also seen how recipients develop a view of and a response to sender organizations over a series of experiences with their documents.

We suggest there is ground to be made up, particularly in structuring documents, so their intentions are clear and the information they carry easy to access, even by readers who skim them rather than read in detail. Such an approach might bring positive reactions to organizations when applied to direct mail as well as to targeted, functional documents.

What works or does not work in the detail of document design is difficult for end-users to articulate, so in order to understand document performance, and its potential impact on perception of the originator, organizations need to understand the impact of documents in detail, rather than rely on consumer ratings. There is nothing new about a strong recommendation for user-testing in the development and evaluation of newly designed documents (see, for example, Wright, 1979). We have shown detailed evaluation is important, additionally, to understand the role documents play in relationships with sender organizations, beyond a document's initial design. To approach this understanding organizations need to investigate reception of their documents as part of a dialogue, with users who have different levels of experience of the organization, and within the everyday context of use.

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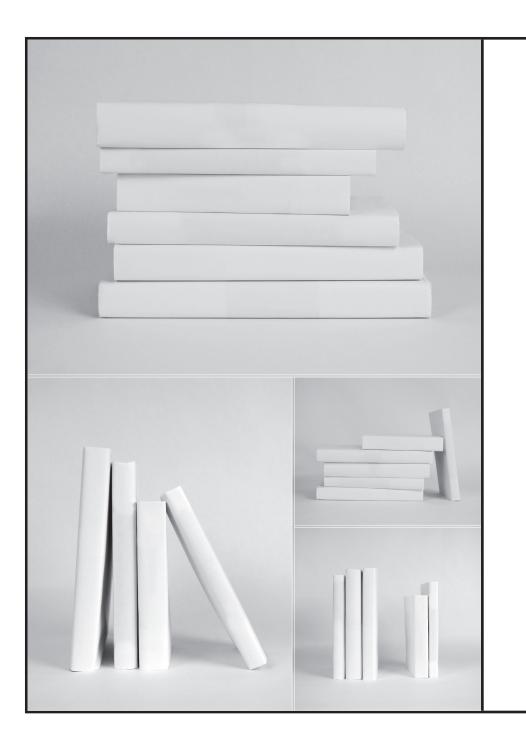
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GRAPHIC DESIGN: NOW IN PRODUCTION:

A NOTE ON EMERGING CULTURAL RELEVANCY FOR GRAPHIC DESIGN

Ian Albinson, Rob Giampietro, Andrew Blauvelt, & Ellen Lupton

Minneapolis, MN: Walker Art Center, 2011

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Paperback, 224 pages, illustrated, full color, \$40.00

Graphic design has arrived—not that it hadn't already. But the exhibition *Graphic Design: Now in Production (GDNiP)* previously on view at the Walker Art Center October 22, 2011–January 22, 2012, presents a cohesive understanding of graphic design as a discipline trying to examine its own sense of self. The catalog makes reference to two previous exhibitions on graphic design of similar scope, *Graphic Design in America* (1989) and *Mixing Messages* (1996), which presented graphic design as a state of individual practice or current themes, but *GDNiP* pursues graphic design in a much more introspective way. It theorizes graphic design as a practice with its own history, vocabulary, methods and aspirations. It is the position of this writer that to claim graphic design is a cultural enterprise is to understand it as an expanding disciplinary project. It is no longer simply a profession, a service, a tool or a means to create desire. Obviously it still serves all those roles, but it has also exceeded them. The co-organizers of the exhibition, Andrew Blauvelt and Ellen Lupton say as much in their introduction to the catalog, "We have sought

out innovative practices that are pushing the discourse of design in new directions, expanding the language of the field by creating new tools, strategies, vocabularies, and content" (Blauvelt and Lupton, 2011).

The respective directors of the two institutions from which Blauvelt and Lupton hail, the Walker Art Center and the Cooper-Hewitt Museum respectively, are not so generous in their assessment. Olga Viso of the Walker and Bill Moggridge, of the Cooper-Hewitt, abide by the conventional perception that graphic design remains a service. In their view, "The field has changed dramatically [...] Design practice has broadened its reach, expanding from a specialized profession to a widely deployed tool" (Moggridge and Viso, 2011). But in fact, graphic design has always been a tool. The Directors let slip their perception that design is still solely about "problem-solving." But as Daniel van der Velden asks in one of the included catalog essays, "Research and destroy: graphic design as investigation," what exactly does graphic design solve: "[W]hat is the problem? Is it scientific? Is it social? Is it aesthetic? [...] Or is the problem the fact that there is no problem?" (Van der Velden, 2006). When not defined by problem-solving, graphic design is able to occupy a (dialectical) position between its autonomy—a body of knowledge and formal operations that separate it from the contingencies of life—and the pressures of social, political and cultural determinism that actively seek to subsume it. Untethered, graphic designers are thus capable of questioning the assumptions and limits that guide design practice.

Unlike painting or sculpture—but *like* architecture—graphic design is still governed by certain limits. Graphic designers, like architects, still abide by professional codes of practice. To ignore such limits is to jeopardize one's relationship with a client or the public at large, which is perhaps why Viso and Moggridge find it difficult to consider graphic design defined by something other than its traditional service role. But when it is approached as a discipline, graphic design has the potential to question the codes that constitute and enforce its limits. By exploring the ways that graphic design is formally determined, it becomes possible for design to discover, invent and assert itself as a unique way to envision and communicate. Van der Velden extends his position by emphasizing that, "The true investment is the investment in design itself, as a discipline that conducts research and generates knowledge—knowledge that makes it possible to seriously participate in discussions that are not about design" (Van der Velden, 2006).

Van der Velden's emphasis recalls the techniques of twentieth-century

avant-garde practice by rejecting the instrumentalization of capital in order to re-territorialize the object of graphic design from within. Yet his position is not an absolute or wholesale rejection of the relationship with consumer capital. Rather, Van der Velden recognizes that in the absence of a client, capital's representative, it is possible to weigh and re-territorialize the codes of practice that were otherwise out-of-bounds. Quoting from a 2010 interview published on the blog DesignObserver, Van der Velden uses the term "speculative design" to describe design's engagement when given the opportunity to ask "What if...?" "When discussed from the point of view of critique, speculative design anticipates a reality, and uses that as a critical device" (Van der Velden, 2010). Much of the work included in *GDNiP* is speculative because it takes the position that graphic designers already inhabit a world where their creations are already valued not for their abilities to "solve problems," but for what they suggest about the state of graphic design as an expression of ideas.

In fact, the catalog of *GDNiP* serves as an example of research inquiry advanced by Van der Velden. The catalog includes the standard fare of curatorial essays that serve to contextualize the work exhibited, but more importantly and more unusual, the curators have included essays previously published elsewhere. The exhibition includes work produced from 2000 to the present, and the inclusion of written material published during the same period suggests that the essays (theory) are on the same footing as the curated design work: essays and artifacts are equally representative of how design has developed over the past ten years as a disciplinary practice. For graphic design to place visual work on the same footing as writing is to understand that it is a practice which has achieved a certain amount of autonomy: it is beginning to question the codes of practice which define inclusion and their limits.

But perhaps most importantly in my opinion, the selected essays do much of the "heavy lifting," which is to say that the selected essays—while not originally written to function as a whole—provide a significant portion of the theoretical insight with which to interpret the work selected for *GDNiP*. Published in chronological order and distributed between thematic essays written by the co-curators, the historical essays do not refer specifically to the work included in the *GDNiP* exhibition, but they do weave together an understanding that forms a pervasive subtext throughout the selected design work. That subtext begins to theorize design's attempt to express authorial control over its own output. It presents a certain strain of contemporary graphic design as a "Trojan Horse," one that mimics the necessities of visual

communication for a client-based profession while surreptitiously engaging in the broadening of graphic design's cultural and social relevancy. Van der Velden's position can be seen as part of a theory arc that includes Lupton's "Design as Producer" (1998); Michael Rock's "Fuck Content" (2005); Lorraine Wild's "Unraveling" (2011) (to which I would add "The Macramé or Resistance," (1998) the essay upon which "Unraveling" largely extends); and James Goggin's "Practice from Everyday Life," (2009). And while the thematic contributions of the various co-curators are helpful, they largely form their own discrete interpretations of the selected design work. The essays noted above, however, stitch together a grander questioning of design's place in society. Such questions are posed by Goggin's contribution: (Context) Do designers occupy a sufficiently unique perspective? (Relevance) Does design contribute anything towards understanding ourselves, our society? (Meaning) And ultimately, can designers have an impact on culture?

The exhibited work and catalog of *Graphic Design: Now in Production* admirably demonstrate design's continuing foray into deeper self-examination while simultaneously revealing design's outward-looking potential to engage with an ever widening list of other cultural territories like conceptual art, literature, politics and philosophy. Given time, as it adds to its vocabulary of engagement, I am optimistic that the discipline will mature in critical significance as well.

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The reviewer, David Cabianca, is an Associate Professor at York University in Canada, and is currently studying contemporary graphic design and issues of representation and disciplinary conflict at University of the Arts London, London College of Communication. He is co-organizing an AIGA Design Educator's Conference titled, "Blunt: Explicit and Graphic Design Criticism Now" to be held in 2013 at Old Dominion University, Norfolk Virgina.

CHASING THE WHITE WHALE, THE MOBY-DICK MARATHON;

OR, WHAT MELVILLE MEANS TODAY

David Dowling

Iowa City, IA: University of Iowa Press, 2010 ISBN 978-1-58729-906-3

Paperback, 242 pages, a few illustrations, black and white, \$24.95

As a *Moby Dick* fan, I simply couldn't resist this book when I read the promotional statement and now I find it fulfills its promise to connect Melville's themes to contemporary life. But first, the occasion for the author to write this book was the marathon twenty-five hour, nonstop reading of *Moby Dick* at the New Bedford Whaling Museum in Massachusetts. New Bedford was a primary site for mid-nineteenth century whaling, so having the marathon at the museum and at the Seamen's Bethel, a chapel, in proximity to amazing whale skeletons and the local lore was perfect. People volunteer to be readers; it is an egalitarian reading with academics, a Melville descendant, children of various ages, politicians, enthusiasts of various stripes and locals. People come and go, but the hardcore last for the full revelation of Melville's magic.

Many cite *Moby Dick* and Thoreau's *Walden* as touchstones of American fiction. The marathon reading is less a celebration of whaling and more a meditation on man's relationship to nature and culture and the search for meaning in life. The people who attend the reading are a passionate and devoted sub-culture. And it is a marathon; it is a slow, inconvenient, unabridged, uneven absorption of a long difficult piece of challenging literature. In a section titled The Politics of Mass Reading, 2009, Dowling asks:

Why would a politician [Barney Frank] be interested in promoting 150-year-old fiction? Is there a nationalistic agenda at the reading to promote American patriotism, especially considering that Moby-Dick was recently legislated as the state novel of Massachusetts? Is this event democratic? How does it ritualize its own hierarchical structure? What can an event like this do for our political institutions or civic engagement or citizenship? What is the advantage of reading a book like this as a group rather than alone? (93).

It does not project a mass motivated understanding—no consensus is achieved, each participant brings her or his own understanding; it is a celebration of diverse readings.

From another perspective, we tend to forget the intimate relationship between speaking and listening, reading and writing, seeing text and reading out loud. In a way this event celebrates the word in its incarnation as spoken and in its archival or memorable sense as words on paper traversing the years. In contrast, I recall the science fiction film, François Trufaut's *Farenheit 451*, in which people memorized important banned (burned) books so that the text lived on embodied by a person.

Dowling makes comparisons between Melville's story and our times, for example, between the exploitation of young men in whaling and the exploitation of youth in sweatshops, and the cross-cultural nature of the sailors (think Queequeg)—the fear engendered by difference and the increasingly immigrant countries we inhabit. The author does not force the comparisons, but makes them in passing. He also has a firm grip on contextualizing Melville in the mid-nineteenth century, he understands the history at play, Melville's own experience as a common sailor and his important friendship with Nathaniel Hawthorne.

This book offers a deep reading of *Moby Dick* as the author expands on and contemporizes the meaning of the tale. It is a scholarly rendition, not overpowering or smug, but suggestive of a new reading and take-away. Now, I must re-read *Moby Dick* for the pleasure of the language and how it speaks to this time.

Reviewed by Sharon Poggenpohl, editor of Visible Language.

CHINA'S DESIGN REVOLUTION

Lorraine Justice

Cambridge, MA: MIT Press, 2012

ISBN 978-0-262001742-8

Hardcover, 144 pages, illustrated black and white \$21.95

The author was Director of the School of Design at Hong Kong Polytechnic University for seven years and as such was deeply involved in design, its development in China and the conceptual differences between design as understood in the West and as understood in the East, not the least owing to differences in economic systems and length of experience with the practice of design. What she accomplishes in this brief book is contextualizing the history, administrative changes, business culture and rich variety of life in China in terms of design education and achievement. She steers clear of politics and some of the thornier issues the country faces like unhappy ethnic minorities, widely unequal distribution of wealth and opportunity, or the impact digital technology ultimately will have on ideas and communication both internally and externally. The book is her personal experience, complete with a western perspective, her lived anecdotes and interviews.

The material is organized into generations, marked from the Cultural Revolution in twenty-year segments, covering four generations. This is a useful device as it demonstrates the broadly changing and often incompatible landscapes of life and expectation present during each subsequent generation. While not a deep history or research covering many people and perspectives,

the author does generalize from her experience and even boldly projects future developments for Chinese design. Given the scope of China and one view through western eyes, such generalizations and future projections may be taken lightly, but they will, nevertheless, provoke thought and attention.

It is always difficult to locate design in a broader cultural-economic milieu, but this is what the author tries to do. There is no overall economic system in China; things continue to evolve. As an example of this the author mentions first-, second- and third tier cities and their differences—then of course there is the countryside. Each has its own problems and opportunities for business, development and lifestyle, and each has its need for design. In a recent issue of this journal, Ken Friedman (2012) wrote an article about design in relation to business and economic models. In the article he postulated six global economies:

1	Gathering, harvesting, hunting and husbandry
2	Fabricating, building, construction
3	_ Transport, utilities
4	Commerce, capital service
5	Information, knowledge services, emotional work,
	human networks, experience economy services, professional
	services, cultural services
6	Direct action on biological, molecular and atomic structure

China is engaged in all these economies simultaneously. Development of design within them is uneven. They are strongest as Justice points out in economy 2, while they build the infrastructure for economy 3. Economy 4 is a challenge for them as they must find their own path and economy 5 also presents challenges in open access to information, knowledge development and human networks necessary for innovation and product development. They have made some inroads with experience design and cultural services via the Beijing Olympics. How design serves these economies is an interesting question that must be answered within both the economic ideas and cultural presumptions that guide Chinese evolution.

Another touchstone publication that can serve as a globalism guide as China takes its place in the world is Arjun Appadurai's (1996, 33) book, *Modernity at Large*. In it he proposes an "...elementary framework for exploring...five dimensions of global cultural flow that can be termed

a ethnoscapes	
b mediascapes	
c technoscapes	
d financescapes, and	
e ideoscapes.	
China is struggling to control its ethnoscapes and mediascapes, while it develops its technoscape and has high attention to financescape. Its ideoscape continues to evolve, but with exposure to influence, both desirable and undesirable, from other cultures and national entities. All cultures are permeable given the technology at hand, and China is ambivalent about control of ideas and actions as it sends its best and brightest to be educated elsewhere, yet tries to control its intellectual borders. It will be fascinating to see China's design future. China's Design Revolution is a quick read that provides some context, but to really grasp what is happening there culturally, economically and in terms of design requires a deeper research with more perspectives from both local	
educators and practitioners. China is pursuing its own path and measuring it by	
western standards may be not only unfair, but finally misleading.	
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$Appadurai, Arjun.\ 1996.\ Modernity\ at\ Large,\ Cultural\ Dimensions\ of\ Globalization.\ Minneapolis,\ MN:\ University\ of\ Minnesota\ Press.$	
$Friedman, Ken.\ 2012.\ Models\ of\ Design:\ Envisioning\ a\ Future\ Design\ Education.\ Visible\ Language\ 46.1/2, 132-154.$	
$Reviewed\ by\ Sharon\ Poggenpohl,\ editor\ of\ V isible\ Language.$	
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BOOK REVIEW

DESIGN & DESIGNING, A CRITICAL INTRODUCTION

Steve Garner and Chris Evans, editors

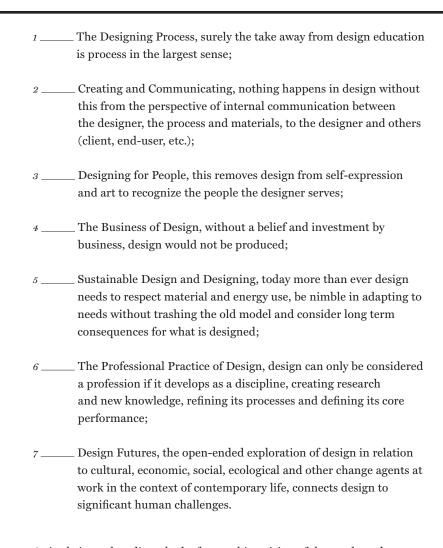
London, UK: Berg, 2012

ISBN 978-1-84788-576-0

Paperback, 483 pages, illustrated, some color, \$49.95

Organized with twenty-eight articles in seven sections, this is an ambitious design undertaking, covering all the design domains and seeking to provide an undergraduate text with which to teach, or at least complement the teaching of design. My sense is that attempts to provide a textbook for design have largely failed—admittedly there have not been many attempts. I suspect this is due to the ephemeral nature of design projects framed to teach fundamentals, the obstacle of teachers' egos, an emphasis on aesthetic creativity and the project-based nature of design teaching itself. So what do teachers do to provide context for projects? They may provide some readings, suggest a search for comparable projects on the web, reveal their own experience with something similar, or provide nothing but the project specifications. Much design teaching is shoddy and fails to prepare students not only with the basics, but the desire to continue their learning beyond their first degree. Design is an open-ended, ever evolving discipline, yet as a discipline it has few standards of performance at various levels of education or practice, and virtually no accepted scaffold (or textbook) grounding design learning, unlike most other disciplines.

Given this context, what does this book cover? The seven sections are:



As is obvious, the editors had a far-reaching vision of the need to educate undergraduates beyond making form, aesthetic innovation, or some romantic but outmoded vision of practice. The book takes into consideration the complexities of design as it is best practiced and does this with a critical attitude.

Design is an international practice and the editors no doubt sought balance between UK educators and practitioners and those from other western

countries. They cover design broadly; the self-descriptions of the contributors do not read like the traditional designations of product, graphic, environmental, etc. Instead the keywords found in the author's descriptions include: e-learning, design research, ecology, design systems, ergonomics, design thinking and interactive media among others. With these descriptors, design is removed from an object orientation and relocated in a broader process orientation where creativity is expansive rather than confined to a prescribed traditional object.

This book aspires to give undergraduates a good contemporary grounding in design as it is now practiced, with glimpses into the future that will include their own challenges and achievements. Its life goes beyond young design students as it can also alert practitioners to the changes taking place in practice and in educating the next generation of designers.

Keviewea by Sharon Pog	tgenponi, eaitor of Visible Language.

READING LETTERS, DESIGNING FOR LEGIBILITY

Sofie Beier

Amsterdam, NL: BIS Publishers, 2012

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Hardbound, 181 pages, illustrated, full color, \$40.00

Like many aspects of professional life, typographic design and typography are not either purely art or science. While the form making may be artful, the constraints on letterforms in its system of other alphabetic forms may use science or the type designer's observation to construct a functional and pleasurable font. The author is well aware of this and covers in *Reading Letters* both aspects. She begins with an excellent discussion of the problems associated with legibility study, as isolating variables and establishing the study protocols separate studies and results, making comparisons across various studies close to impossible. Further, type is used in many contexts; for distance reading via signage, for textual emphasis, for continuous reading in various situations and many more direct applications.

Beier takes a holistic approach to the topic, providing historical information, recognizing evolutionary moments in type design along with the designers responsible for the change, whether historic, contemporary or new to the type design pantheon. Best of all, she covers the discussion briefly and demonstrates the ideas and changes graphically through showing the type designs themselves and calling the reader/viewer's attention to the feature under discussion. This book provides much useful information for design students learning to use typography appropriately, perhaps not a first course but a second.

It also serves novice type designers with its various perspectives. Besides this, the book is beautifully designed with telling visual demonstrations and this is always important when delivering information to designers.

Reading Letters is based on Beier's PhD dissertation at the Royal College of Art, London, UK. If the Royal College is anything like American universities, the constraints for writing and documenting research and its final reporting are standardized and not friendly in its approach to a reader or user. Such scholarship is often pedantic and visually ugly. This publication, as mentioned, is well and carefully designed making the information accessible and clear. Many more thoughtful and scholarly dissertations deserve serious publication in this manner. I hope more such work makes it into design literature, as knowledge needs to be shared and research is not complete until it is published. Beier has provided a substantial typographic resource that joins art and science.

Reviewed by Sharon Poggenpohl, editor of Visible Language.

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