Vanishing legibility: daily departures from best practice

This paper is concerned with potential difficulties faced by older readers. Our aim is not to present new scientific findings, nor to review previous work in this area. Rather we wish to provide a demonstration of everyday reading problems for ageing individuals. One of the classics on the use of print1 addressed the matter of font size and shape before the responses of the human visual system had been explored in the detail now available2. The vast technical advances in colour printing and other forms of reproduction, together with the purveying of important information by electronic means. includina television. have greatly increased the scope for varieties of presentation. They involve font type. size, and colour of text against a multitude of backgrounds both in printed and electronic products. Earlier data on the legibility of text have become partly overtaken by time or altogether forgotten.

Eye-test charts exemplify best practice (Figure 1). Note the letters of different sizes. They are rendered with equal amounts of pigment (printer's black). But their visibility is unequal, since this depends both on the amount of pigment, even if it is black, and font size. Thus, though the physical contrasts of a small and a large type may be equal, the perceived contrasts will differ, being smaller for the smaller font (Figure 1). When held at the distance of 40 cm from the eves, normal non-elderly evesight should comfortably read the line marked 1.0. This corresponds to the British notation of 6/6 and to the American Imperial measure of 20/20. It is probable that there will be a significant percentage of the older population, who are unlikely to come up to this standard even when the font is jet black on white³.

The right-hand side of Figure 1 represents a continuation of the left-hand part, but presented with reduced contrast. This serves to mimic how an individual with a cataract might perceive the chart. It demonstrates that legibility decreases with font size, although all the samples have had their contrast reduced more or less equally.

Figure 2 reproduces the same chart on a blue background. This diminishes the contrast between print and background in two ways. Firstly, the blue background reduces the contrast with the black print in comparison with the white (or other lighter) background. Secondly, when this reduced contrast is allied to the simulated impaired vision, only the very large type remains legible.

It is important to remember that the designer's palette may differ radically from that of the reader. This applies especially to electronic reproduction, which may result from both technical and idiosyncratic variability, not to mention the effect of colour vision defects. Thus, although some font-background combinations may be thought to attract attention, or have cosmetic merit, the medium may defeat the message.

ILLUSTRATIONS FROM EVERYDAY LIFE

We have reproduced, in their actual life size, four examples from everyday sources (*Figures 3-6*). They show how perceived contrast varies with difference between print and background. A lower contrast due, for example, to white on pale blue or mauve, or black on some intensely saturated colour background, or a font chosen on cosmetic rather than legibility grounds and compounded by indifferent lighting conditions may offer a critical barrier to legibility⁴⁻⁶.

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Figure 1. Eye-test chart in real size to be used at 40 cm distance: black font on white background with the effect of a cataract shown on the right hand side of the page

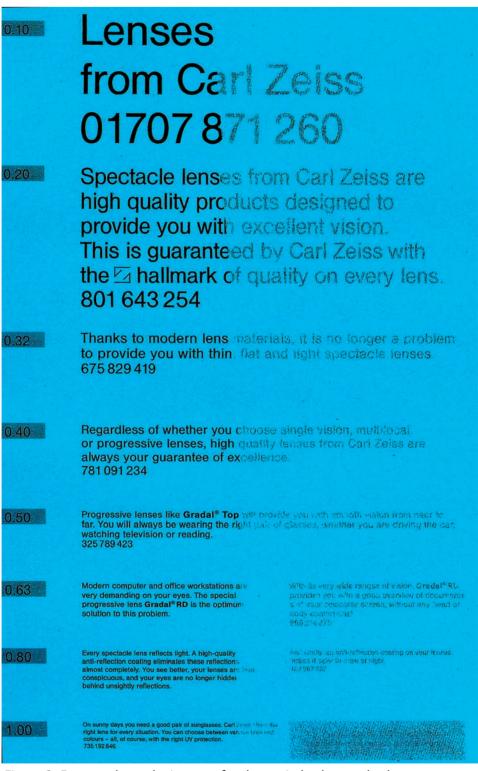


Figure 2. Eye-test chart: the impact of a change in background colour



Figure 3. Car breakdown membership card (real size): crucial information vanishes

Figure 3 is the back of a semi-transparent membership card with telephone numbers for use in the event of car breakdown. Comparison of the font size of these numbers with the test chart (*Figure 1*) shows that the size is comparable with that shown for 1.0 vision, i.e. the norm for corrected non-elderly adults. In Figure 3, the crucial information is printed in white on the red/orange background and effectively vanishes. Although changing the font colour to

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Figure 4. Advertisement for car insurance (real size): aesthetics overrides clarity

black makes some of the small black text decipherable against the red/orange background, the very small print on the right hand side of the card is virtually illegible. In Figure 4, an advertisement for car insurance in credit card format (the same size as the RAC card), the pale blue background provides a superior contrast to the black font, which is also mostly larger. However, despite the font

size, the light-blue font below the telephone number is difficult to read because of the lack of contrast in the blue background – aesthetic considerations have over-ridden clarity.

Our final examples are drawn from food packaging. When one considers the current emphasis on independence for older people as long as may be possible, cookery instructions - perhaps especially if used by widowers - assume a social significance. The examples in Figure 5 and 6 are interesting. Both illustrate the combination of small print with unhelpful contrast. Both include minute, if not minimal, font sizes. Underneath the title in Figure 5, the instructions hide from the reader that the joint is easy to carve, to roast, and serves 3-4 people. Lower down, further instructions about freezing the product are given in a red font on a pink background, presumably for cosmetic reasons. In Figure 6, blue is used to present information about pork escalopes. Again, neither font size nor contrast are apparently designed for legibility, although the price is clear (!), with its large black font and yellow background.

Conclusions

The illustrations typify the mass of well-meaning but hard-to-read texts that older eyes may have to struggle with.



Figure 5. Cookery instructions (real size): small print with unhelpful contrast

They will be found in print and on screens, on words of direction, on price tags, and warnings, in addition to advertising, and other commercial notices and placards. Since older people are becoming more numerous, the information industry ought to adapt its methods to take them into account. A piece of eyecatching information cannot be said to be effective if it cannot be read.

Acknowledgments

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Figure 6. Pork escalopes: only the price is clear (figure reduced to 63%)

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