

# Increasing Visual Text Accessibility for People with Partial Sight

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One of modern civilization's defining features is its use of text as a communications medium. Text allows for the uniform transmission of verbal messages to audiences of any size, location, and at any time. The wide use of text in directional and informational signs, in printed matter, and in electronic media such as television and computers, makes the lack or loss of text skills a significant impairment to participation in many crucial activities of modern life.

Although large text letter forms are more legible at a wider range of distances than small forms, economic and/or space constraints often make good legibility a trade-off against availability of page or sign "real estate." In printed matter, where increasing text size usually requires adding pages, choice of text sizes depends at least as much on economics as on legibility. (The 20 volume Oxford English Dictionary is now available in a single volume that costs about one-sixth the price of the full edition, but the print is so small that a magnifier is included!).

In signage, text sizes are usually determined informally by local consensus about what an "average" person can see at the intended viewing distance. Even in government-regulated traffic and building signage, and where sign makers take the trouble to consult published guidelines, text sizes are referred to a "standard" observer with more or less typical resolving capacity of about 20/20, and recommended sign text or text sizes typically offer little room to accommodate those with lower acuity.

Because of the economic and space incentives to make text as small as is

feasible, in our society the ability to read text is very much a measure of the capacity to resolve fine details of visual patterns. Indeed, for people with impaired vision, who often have a diminished capacity to process detail, accessing text is generally the central goal of rehabilitation. The primary strategy for such rehabilitation is image enlargement through large print, or through optical or electro-optical magnification of the retinal image. Enlargement works because it makes letter features more discernable by transforming them from fine details the individual has difficulty processing into gross features that are more easily processed.

There is a useful distinction to be drawn between methods of increasing legibility that require modification of the physical text and those that alter the optical image of the text as it reaches the eye. Examples of the former are enlargement of the text itself, as in large print books, and environmental modifications such as large signs. On the other hand, magnifiers such as telescopes and electro-optical magnifiers such as video magnifiers are examples of the second kind of legibility enhancement, because they stretch the image of the text rather than the text itself. The principal advantage of magnifiers is that the person with partial sight can use them to increase the legibility of any text, even text that has been designed without specific consideration of partially sighted users' needs.

In addition to text size, there are a number of other important factors that determine legibility, including the color and contrast of the text against

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its background, the text font style, the interletter, interword and interline spacing, the boldness of the letters, and the finish of the page or printing surface. Choices of these variables can increase text legibility for those with partial sight. In general, these factors cannot be easily manipulated without modifying the text itself. Some video magnifiers, however, are capable of enhancing contrast somewhat. Also, there are scanner/video magnifier combinations currently available, and more under development, that alter typography in limited ways. There are also video image enhancement

devices under development with extensive image processing capabilities. All of these are designed to increase legibility for partially sighted users.

With the Americans with Disabilities Act of 1990, employers and builders of buildings with public access are now required to make "reasonable accommodation" for people with vision loss, as well as other disabilities. Because of the diversity of types and degrees of vision loss, there is no way to guarantee legibility in the same way one can guarantee that a wheelchair will fit inside a door frame.

But through good choices of color, typography, maximum feasible text sizes, and placement of text so that it can be viewed at a very small distance, sign manufacturers and other designers can maximize the potential for environmental readability of text, and extend the range of sizes a partially sighted individual can effectively read without additional devices. Portable devices such as optical magnifiers, of course, can further increase text legibility and accessibility of signage and print. ■