

Working to 508: Seeing, Hearing, and Understanding Accessible, Usable Web Pages

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Now that the U. S. Government has mandated that web pages comply with accessibility standards (Section 508, a 1998 amendment to the Rehabilitation Act of 1973), it is time to test web pages against the standards. “What do newcomers to these standards need to know to ensure that they are on the right tract with accessible, usable web page design? “What do web page designers need to know beyond 508 standards? Join us in an exploration of our personal experiences with “stuckness” when using web pages (visual accessibility), Reece; learn possible solutions to our “silent screams” (audio accessibility), Vinegar; and consider also the question of web page accessibility to users with cognitive or learning disabilities (comprehensibility), Gillen.

WORKING TO 508: SEEING ACCESSIBLE, USABLE WEB PAGES

Gloria A. Reece

“In what ways do readers with vision problems get “stuck” when they use web documents?” In this article, I will discuss “stuckness” and my “art of accommodation” with Strabismus (crossed or lazy eye) with amblyopia due to adverse refractive error as it applies to 5 areas: (1) reading, structural cues, and wayfinding (2) multimedia, (3) text design and visual threshold, (4) contrast, and (5) glare and electronic displays.

“Stuckness” Situation #1: Reading Structural Cues, and Wayfinding

Problem: Reading, Structural Cues, and Wayfinding. As I write this article, I can recall very vividly how I learned to read. In the 1960s, teachers used “reading groups” to assess students’ progress in reading. Students in the groups were asked to read from a specified passage without error, using aids to mark their place and sounding out words during reading. The teacher usually began the readings with a student next to her (usually on the right) and went progressively around the group, with each person taking a turn, until the required reading was complete. These reading groups were very problematic for me because I read very slowly and needed to place a pointer on the lines as I read them. Teachers complained to my parents about my reading skills and methods. My parents (also K–12 educators) spent countless hours

working these issues with me. These sessions continued through most of the early grades until I learned how to accommodate for reading tasks. One day, during a reading group session, I noticed that teachers most always started with the student on her right first and went progressively around the group until the task was complete. The next day, I decided to change my seating in the group so that I would read last instead of first. When I made this change, I could “hear” the story as others read their assigned lines and point to the lines as they were being read by others. This strategy helped me because I had also learned that I suppressed my right eye during reading tasks, relying on my left eye. Then, when it became my turn to read, I was already familiar with the text and story. (Both of my parents have Strabismus (forms that did not require surgery for the lazy eye condition. My father also suppresses his right eye—consequently, here lies the double-whammy genetic connection for me!)

Some vision problems cause people to lose place when reading from line to line (Reece, 2002). In my case, it was difficult to see the words on the page because I always saw my nose first (a result of the eyes crossing)! Another problem was that I was not allowed to place a pointer at the beginning of each line (establishes figure-ground) for keeping track of where lines begin and end. Another problem that contributed to the reading situation was seeing more than one image of something—a result of the crossed or lazy eye.

In a recent conversation, my mother told me that my biggest concern in school was not being prepared for the next day’s class. She said that I would not let my father or her rest until I was satisfied that the work for my assigned readings was done!

I continued using this accommodation strategy until I had a writing class with a new professor (Howard) at Florida Institute of Technology (<http://www.fit.edu>). Each term, I usually purchased my books for the upcoming term as soon as they hit the bookstore shelves (not later than the last week of class). In a sophomore-level writing class, this new instructor required us to purchase three books for the class. Two of the texts were on poetry subjects. At this point, I anticipated a problem, yet I didn’t know how to fix it. I decided to start with a discussion with the professor about the accuracy of the purchases and if all three books would be read during the course. The answer was “yes” to all of my questions. My next reply was this one, “I read very slowly; I need to start on the readings now so that I’ll be prepared!” Before the conversation ended, the instructor talked me into putting the books aside until the start of classes the next term. I trusted his

judgment and waited. Until now, I had satisfaction in becoming an educated, non-traditional student. Now, I had some uncertainty about the outcome.

I attended Howard's classes that next term, and excelled at many reading tasks! Howard's use of Socratic dialogue in class discussions taught me more about critical thinking and how to solve real-life problems than any class I had ever taken. Additionally, his encouragement for us to infuse technology into our writing process was also helpful. For the first time in my life, I could "see" and "hear" the words on the page and write (and revise) responses to my readings. He gave structural pointers (chunking, queueing, filtering, mixed mode (lists, tables, figures), abstracting (layout)) to information in the text that allowed me to develop better wayfinding strategies for locating information in dense text. His dialogue with students was exceptional; it helped me keep pace when eyestrain hit. And, he frequently said to me, "It's okay to mark up your book. Make it your own!" By the end of this class, I was taking my first two baby steps again—learning how to read and write!

Today, I continue to use the strategies that I learned in Howard's class. As I write this article, I have successfully graduated from my doctoral program in Instruction Curriculum Leadership with a concentration in Instructional Design and Technology at The University of Memphis (<http://www.memphis.edu>), and have completed an empirical, clinical study entitled, "Text Legibility for Web documents and Low Vision" (available in Dissertation Abstracts) (Reece, 2002).

Current Strategy. My first step in reading an on-line document is to assess its structure by asking the question, "Where does the document begin and end?" "What's in the middle?" "Stuckness" occurs when entry points are not clear. When using wordprocessing tools, I establish a figure-ground connection with the words on the page and the background. Sometimes, I use the toolbar rulers or non-printing characters. (See also the section on "Contrast."

"Stuckness" Situation #2: Multimedia

In general, computer-driven multimedia is difficult for me due to use of animation and clarity. For example, videos need to be very clear in both sound and image before they are useful. Since I rely on lip reading to understand conversation, a lack of clarity in image can impede communication. For example, if I am looking at a video of someone giving a presentation, the image and actions in the clip must be extremely clear. If the person reads or looks away from the audience (me), then there is too much opportunity for confusion about the communication. Lack of sound clarity can also be problematic, as my ability to hear clearly fluctuates with my mode of visual accommodation. (As I change reading aids, I note differences in my ability to hear clearly.) Conversely,

music played loudly on the computer via CD is the most relaxing method that I can use to relieve pain from visual and mobility stress.

"Stuckness" Situation #3: Graphics

Problem: Multidimensional Images. While in Florida (mid 1980's to 1994), I had an opportunity to design a logo for a small business owner. The owner wanted a simple logo to match the name of business, "Fulcrum Associates." The first graphic that came to my mind was a fulcrum. All of the textbook examples seemed to be renderings of objects—circles, lines, and triangles. With textbook in hand and an object-oriented drawing tool launched on the computer, I created my own version of a fulcrum for the logo in three variations. I asked for a preliminary opinion on the designs from one of my professors (Carol). After reviewing the materials, she asked, "Gloria, why don't you try a 2- or 3-dimensional image?" That conversation left me a bit puzzled. On the way to the computer lab, I kept asking, "What is 2D or 3D?" I decided to have a conversation with my husband John, an electrical engineer, on a subject that I called, "Drawing for Dummies." I showed him my logo examples, and asked him to explain the concept of 2D and 3D images. For the first time in our married life (now 22.5 years), he realized that I could not perceive depth. Strabismus has an impact on one's ability to see depth. With his help and an electronic drawing tool, I was able to successfully create a logo for the client.

Current Strategy. Today, there's a lot of hoopla about creating multidimensional images for web pages. In cases like mine, fancy graphics may not matter. Rather, alternative text descriptions ("Alt" text) are more helpful for graphics. Breaking news reveals that blind engineering students at the University of California at Berkeley are developing a computerized drawing program that allows visually impaired people to create and "see" graphics on-screen (<http://www.upi.com/view.cfm?StoryID=29062002-013151-6549r>).

Problem: Text on Curves. Web pages and some applications that contain circular objects using reverse print on small circles containing color (like M&M candies) for key navigational elements (e.g., menu names) are also difficult to read.

Current Strategy. Visually impaired users must perform such tasks very slowly because they must first train their eyes to follow the circumference of the circle in order to "visualize" the background object and then extract its meaningful content—the text message (e.g., "File Menu").

Problem: Text that Blinks and Moves. Web pages that contain moving and blinking text leave me bewildered and asking this question: "Can people read those moving and blinking objects that fast?" Since I read with one eye,

moving objects and blinking text are very difficult to process because they change before they can be seen!

Current Strategy. Be proactive about the situation and ask for help.

Problem: Menus. Lengthy pull-down and right-extending types of menus are problematic for me due to the fine motor skills that are required to use them. Oftentimes, it requires multiple attempts to complete a single task.

Current Strategy. Explore keyboard shortcuts or link alternatives. When all else fails, ask for help.

“Stuckness” Situation #4: Text Design and Visual Threshold

In writing programs, I adjust font size through the “View” menu expressed in percent. When type is outside of my visual threshold, I rely on print materials and accommodation through various reading aids (e.g., contact lenses and/or eyeglasses designed for specific purposes, hand-held magnifiers, enlarged print, custom room lighting, etc.). These strategies are very apparent to my students during class; some of them ask, “Dr. Reece, how many pairs of glasses do you have?” Other instances where font size could be improved are in documents associated with shopping (e.g., charge card and cash receipts, tags for clothing size, and bank teller receipts, etc.).

Problem: Text Size. Text size is something that I frequently customize when I am writing a document. Programs like Zoom Text™ are not especially helpful for me because they create too much distortion; I see better at near distances than far. Keypads that contain small letters and numbers are also difficult. For example, I have an older model cell phone that contains a small, difficult-to-read display and keypad. Each month, when the phone bill arrives, my husband asks, “Honey, who do you know at ...?” I reply, “Well, what’s the date of the call? Oh, that must have been the call I made with a dialing error.” Adding information to a stored phone book does not help me because the display is incompatible with my visual threshold. Additionally, dimly lit environments and those with glare add further complications. (See also, “Glare and Size of Electronic Displays.”)

Current Strategy. When viewing an on-line document, I usually change text size through the percentage view. As for the small keypad on the cell phone, I memorize the sequence of the buttons. And, sometimes I still get stuck!

Problem: Fonts. Fonts that have insufficient contrast between foreground and background are difficult to read, encouraging premature reading fatigue.

Current Strategy. Terry Clark, a country music singer, best sums up my approach about using fonts with her hit

song, “Easy on the Eyes!” In general, I prefer familiar, easy-to-read typefaces. For dense text, I prefer a serif face and print on a high-contrast (black or white) background. (See also, “Contrast.”)

Problem: Proportional and Monospaced Print and Dense Text. Since I rely on one eye for both reading and distance activities, electronic documents (e.g., web pages) that require reading of dense proportionally-spaced text on screen is difficult and causes reading fatigue.

Current Strategy. Whenever a web page requires me to read dense text, I generally print the material out so that I can accommodate using a variety of reading and printing aids. I can also use self-generated Socratic questioning strategies to make content my own.

Monospaced print is easier to read. For example, e-mail that contains dense text is somewhat easier to read when written with a monospaced font. When reading dense text in this medium, I mentally divide the screen page into three vertical columns. I skim down the first column to get the “gist” of the message. If it is important, I either skim the second column for more detail or print the material out for reading.

Problem: Headings and Structural Cues. When headings lack a clear structure and are inconsistent in style and placement, it creates confusion about the document’s structure and impedes wayfinding.

Current Strategy. I prefer left-aligned headings and structural cues. Since I read with my left eye, this alignment makes the task much easier.

“Stuckness” Situation #5: Contrast

Contrast between foreground and background is essential for good web page design.

Problem: Lack of Depth Perception. Strabismus is responsible for my lack of depth perception. This inability to perceive depth causes “stuckness” of various forms. In order to see, I rapidly parse a visual scene into discrete parts and then use figure-ground strategies to help me navigate. Some examples of where these strategies occur are writing (with or without a computer), drawing (with or without a computer), filling a coffee pot with water, driving a car, and moving objects from one place to another.

Current Strategy. For example, when using Microsoft Word™, I use the “Normal” view with paragraph symbols turned on. The dots between words and the paragraph symbols help me keep my place. The paragraph symbols are helpful cues for visualizing and processing “chunks” of information.

Problem: Technology for Changing Contrast. I have also explored accessibility accessories for modifying contrast in on-line documents. For example, when using Microsoft Word™, I have used the “Accessibility Wizard” for changing the background color of a document; however, the accessory that came with my PC is difficult to maintain as a “standard” setting between boot and shutdown processes in spite of specifying appropriate setup information. Additionally, the wizard does not seem to translate to all of the applications that I use and poses usage limitations.

Current Strategy: Continue to accommodate.

Problem: Lack of Color Application at the “File” Level for Outlining Tasks. I use color as a wayfinding strategy. Few wordprocessing or publishing programs have the capability to change the color designation of sections in the document from the “file” level.

Current Strategy. For example, I use Inspiration™ software for outlining when I write. I use red headings for first-level items and then change colors for headings at lower levels. This strategy helps me locate information faster.

“Stuckness” Situation #6: Glare and Size of Electronic Displays

For computer work, I use three types of displays: (a) active (commonly found on most PC monitors), (b) reflective (commonly found on most LCD monitors such as laptops), and (c) backlit (commonly found on most Portable Desk Accessories (PDAs) and cell phones).

Problem: Glare. Glare is problem for me in many settings. And, electronic displays in general cause me difficulty. For example, recently, my 1990 Toyota Camry started having trouble with the air conditioning—lack of cooling on days when temperatures in Georgia were in the 100-degree range! After taking the car to the mechanic for a check-up, the mechanic replied, “Your car passed all of my tests—I don’t see a mechanical problem!” A couple of days later, the air conditioning quit working again on a long distance trip to Memphis, TN. Apparently, something tripped the control and caused the air conditioner to stop producing cool air. The indicator light on the air conditioner display panel was a problem. From my perspective, it was difficult to tell if the “green” light was on or off. Cell phone conversations with my husband then became interesting. He kept asking, “Is the light on the air conditioner control panel on or off?” I kept responding, “Honey, it’s black—either way the air conditioner button is pressed on or off—it’s black; I don’t think that I see the same things you see!” There were two problems here: First, the air conditioner control panel was in the area of my reduced visual field and was not clearly discernable. Second, illumination and glare (bright sunlight) was also a factor.

Current Strategy. When doing computer work, I prefer laptops to regular computer monitors because they reduce problems with on-screen glare. For example, when I work at a regular monitor using Microsoft Word™, I usually accommodate and change the background color to something other than white or bold blue (see (Tools Menu, Options+General Tab). In doing so, I can achieve better contrast and less glare. I do not use the bold blue settings that Microsoft provides because that color causes severe headaches. (I have trouble with using bold blue in large, backlit areas. This sensitivity may be due to a retinal problem.)

When I purchase computer monitors, I usually buy the largest monitor that a given vendor makes; I need the real estate! The most comfortable display for reading is my big-screen laptop—a Dell Inspiron 7000™. As for PDAs, I carry one; however, my i705 Palm Pilot™ (black and white version) remains difficult to read. “How do I accommodate?” I keep electronic planners and task lists; however, I print the materials or translate them to paper-based products—includes my “big print” telephone book in my favorite sans serif font for reading in dimly lit environments (e.g. in the car while traveling). I have been an early adopter of PDAs and find them useful for organizing lots of information, writing task lists, doing reflective journaling; however, the small screens are problematic.

My area of professional expertise is design of web pages for low vision. When designing for the web, a few questions that designers may want to consider are the following:

- If the site uses images, is alternative text used?
- Is the page capable of being understood when the user cannot see certain colors?
- Is there sufficient contrast between foreground and background elements? For example, is the font easy to read on the selected background?
- Are font sizes easy to read?
- Does the page use plug-ins (e.g., Flash, Shockwave, etc.)? If so, is the page viewable without them?
- Are all links unbroken? Are they easy to read? Are they accessible?
- Are there any pop-up items? If so, are they easily hidden from view?
- Is the page navigable without a mouse?
- If the page has sound, does it use alternative text or the ability to navigate the site without need of sound?

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WORKING TO 508: HEARING WEB PAGES

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Four years ago, on a winter evening, I am happily cruising along on the information super highway. I stop at a site featuring the life of Susan B. Anthony and quietly gasp at what I see: A short few sentences explaining that a mouse click will download a video version of Ms. Anthony's life. I tentatively click, somehow knowing that I will be barred from this site.

And yes, it is exactly as I feared—due to my high frequency hearing loss, I cannot understand what the narrator in the video is saying. But what I do hear is the clang of a jail cell door, and I shudder at the thought that the information super highway may someday be off limits to me.

Four years ago, I did not know that there were good, fair-minded people out there working tirelessly to make certain that this would not happen. Web designers are aware of the Rehabilitation Act Section 508 guidelines that prohibit excluding people with disabilities. Web designers are also aware of web media accessibility programs (SMIL, SAMI, MAGpie), and they use the hot-off-the-press captioning tools available to them.

But interestingly, it takes more than following the Rehabilitation Act Section 508 guidelines and understanding web media accessibility programs to design web pages that people with hearing loss can truly "hear." I am not a web designer, but I can give you a personal account of the things that frustrate me (my silent screams) as I attempt to hear web pages.

Silent Scream #1: What happened to the captions?

AbleTV.net is billed as the first global TV network for the disabled and is the Internet's leader in streaming video with audio description and captions. I am happily watching AbleTV's "WGBH Elevator Video" about Einstein's thoughts on gravity and acceleration (www.abletv.net/) when suddenly the captions disappear while the narrator continues to speak. Aack! This frustrating loss of the captions causes me to wail in disbelief. My husband watches the video and lets me know that when the captions are off, the narrator is describing the scene for those with low vision. While I am

glad that the narrator is describing the scene for those with low vision, my complaint is that those with hearing loss are not informed that this is happening.

Because people with hearing loss can't hear the audio description, they automatically think they are missing important parts of the presentation. How about a captioned message saying, "narrator describes scene" during the intervals with no captions?

Silent Scream #2: The hidden captions button

Ahh, yes—I pour a steaming cup of Joe and set up the WGBH webcasts of free public lectures: <http://streams.wgbh.org/forum/forum.php?organization=WGBH%27s+own+lectures>. As I settle down to watch these videos, I have no fear. I know that WGBH is a foremost authority on web accessibility and a long time champion of captions. But wait! No captions! I race to turn on the captions. Frantically, I search the menu using the frustrating trial and error method. At last, after missing the first crucial part of the lecture, I find the captions button—buried deep in obscurity:

*In RealPlayer, you turn captioning on this way:
View menu>Preferences>Content>Accessibility.*

*The newest version, RealOnePlayer, requires this route:
Tool menu>Preferences>Content>Accessibility.*

I turn on the closed captions and wait for the precious words to appear on screen. But the video isn't captioned. Larry Goldberg, from the Media Access Group @ WGBH, Boston, MA, explained to me (via email) that the money isn't there to caption these videos.

Poor design or rookie user?

My disappointment at not having the WGBH lectures captioned is heightened by the fact that I had such a difficult time finding the captions button while the lecture was in progress. I berated myself for not knowing where to look for the button in the first place.

But I have since learned that the author can create (or script) a visible captions button right on the front of the screen. The video, "Dying to be Thin," on the PBS Web site <http://www.pbs.org/wgbh/nova/thin/program.html> can be played on a QuickTime or RealVideo Player. The QuickTime Player has a captions button on the front of the screen and the RealVideo Player does not.

Section 508: Not another nuisance law

The National Cancer Institute's 508 Multimedia Tutorial <http://oc.nci.nih.gov/web508/tut-b.html> provides an in-depth explanation of what it takes to be compliant when it comes to multimedia and audio material:

- Audio Material: Requires a written transcript. Synchronized captions not required.
- Multimedia: (A video of a presentation). Requires synchronized captions.
- Live webcasts: (Live streaming video). Requires synchronized captions.
- Live audio: Does not require captions as explicitly stated; however, without captions, those with hearing loss can't access the information at the same time as other users.

On behalf of all people with hearing loss, I extend my gratitude to all web designers who work to understand and design web sites that we can all clearly hear. In the words of Margaret Mead, "A small group of thoughtful people can change the world. Indeed, it's the only thing that ever has."

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WORKING TO 508: UNDERSTANDING WEB PAGES

Lori Gillen

Imagine that you've just returned to work from a week of vacation and you find that your project is due two weeks early. You enter your office with your mind somewhere on the shores of Maui where you vacationed, but you are now being pulled into the workplace by several people

who need immediate solutions to problems that they could not solve while you were away. You finally make it to the inbox of your e-mail client and see that you have 102 messages. Over a third of the messages are flagged with high importance.

You need to read the important messages, absorb them, process them, and then respond. You already have a lot on your mind. You are feeling overwhelmed and frustrated. These feelings are fogging up your head so that you can't formulate your responses clearly. How are you going to read and understand all those messages quickly enough to give productive responses to all those people who want immediate answers?

In "*The Design of Everyday Things*," Donald Norman discusses how people automatically blame themselves when they make a mistake using a product. When an employee returns from vacation to an inbox full of messages, the inability to get through the list efficiently in a short period of time can create a feeling of self-doubt and a fear of making mistakes. If this fear becomes debilitating then it can be a cognitive barrier to getting work done. These feelings of inadequacy are similar for a person with a reading comprehension problem.

When Tim Berners-Lee created the World Wide Web in late 1990, it was his intention for all users to have equal access to his creation. "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect." As the Web evolved, new authoring tools emerged providing new-fangled functions for creating fancy Web pages. Designers took advantage of these functions to create slick-looking Web pages, but what they didn't realize was that these "bells and whistles" posed barriers to Web access for people with disabilities. Now, Section 508 of the Rehabilitation Act requires that Federal agencies make their electronic and information technology accessible to people with disabilities.

The purpose of this document is to raise awareness about Web users with cognitive impairments in reading comprehension, describe some of the barriers that prohibit them from using the Web, and provide design recommendations to help lift those barriers and meet Section 508 requirements.

Understanding cognitive barriers

The National Institute of Mental Health defines a cognitive or learning disability as a disorder that affects people's ability to interpret what they see or hear, or to link information from different parts of the brain. The disability can manifest itself in speech, reading, writing, coordination, self-control, or attention. People who suffer from cognitive disabilities can have one isolated disorder or multiple, overlapping disorders.

To read proficiently, there needs to be a healthy network of nerve cells connecting the brain's centers of vision, language, and memory, because reading involves performing several tasks simultaneously, including:

- Focusing attention on the printed marks
- Controlling eye movements across the page
- Building ideas and images
- Comparing new ideas to what is already known
- Storing ideas in memory

But many people cannot read proficiently, because they have reading disorders. In some reading disorders, the brain may not be able to form images or relate new ideas to those stored in memory. A person who has this type of brain dysfunction may not be able to understand or remember new concepts. In other reading disorders, some people are not able to distinguish or separate the sounds in spoken words, so for example, they may have trouble with words that rhyme. Some people are unable to focus their attention on their reading material, and once they are finally able to concentrate, they are easily distracted.

People with reading disorders are slow to process their reading tasks. The Web is known for its vast quantity of information. Simply facing this monster can be a daunting task for someone with a reading problem. If the monster has flashing displays and dancing animation, the reader who has an attention problem will just be too distracted to concentrate.

Removing cognitive barriers

With Section 508 of the Rehabilitation Act, Federal agencies must make sure that their electronic and information technology is accessible to people (such as employees and members of the public) with disabilities (such as vision, hearing, cognitive, and mobility impairments).

People with problems in reading comprehension can benefit from Web site presentations that resemble a slide presentation with a simple navigation process, small pieces of information, and short, concise sentences. The following web site presents an example of this usage. The site needs navigational work, but it is a step in the right direction.

<http://www.learningdifficulty.org/camitalk/index.html>.

Many guidelines have been written to accommodate the Section 508 mandate. The most widely known are the W3C Web Content Accessibility Guidelines, which list recommendations for improved accessibility including these items to help people with cognitive difficulties:

- Providing context and orientation information
- Providing clear navigation mechanisms
- Ensuring that documents are clear and simple

In his book "*WEB Accessibility for People with Disabilities*," Michael Paciello suggests design recommendations for the above guidelines:

Providing context and orientation information

Paciello suggests grouping related elements together using labels, headings, and names for frames.

Providing clear navigation mechanisms

Paciello suggests that there should be a way to return to the home page or major sub-sections with only one or two steps, because the most frequently used feature of any web site is the navigation system. Paciello also says that users want to be able to quickly locate and digest information. When they must interact with a Web site to fill out forms or travel between documents, that process should be intuitive and consistent.

Ensuring that documents are clear and simple

Paciello says that consistent layout and navigational icons can aid those with cognitive disabilities, because they require visual memory aids and simplified page design. Clear and concise language can assist all users and can be a great help for people whose native language may not be used on your site.

How can Paciello's suggestions remove cognitive barriers? As mentioned earlier, some brains may not be able to form images or relate new ideas to those stored in memory. Grouping related elements with labels and headings may help a user with this dysfunction to make relationships among elements. Some people cannot focus their attention on reading. An intuitive navigation system can help a distracted user from getting lost within a web site. Other people may not be able to understand or remember new concepts. Using concise language and visual aids may be an easy way for a user with this problem to process.

Conclusion

Research suggests that people with cognitive issues, specifically problems with reading comprehension, can benefit from grouping related information together, displaying information in short and simple units, and making the site easy to navigate. Designers can achieve these requirements by grouping information into headers and labels, using a consistent and intuitive layout, and using clear and concise language. What is interesting is that this approach can be equally useful for people who identify with the person at the beginning of this section of the paper, those who have just come back from vacation only to be forced to process an overload of information much too quickly.

Donald Norman explains that when people cannot use a product well, they do not consider the fact that the problem may actually be with the product's design. The employee's inbox may benefit from another design

iteration, one that enables users to make choices that accommodate their personal learning styles. The world is a fast-paced venue with information flying at us. Information technology needs to work with users, not against them.

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