

Eyetracking and the Web

While recently looking over some of the articles in Linda Goin's recent series [Web Design Mysteries](#), I was struck by how much design I just completely overlook when I scan a Web page. Many of her insights, while familiar to a skilled artist like herself, were a complete revelation to me.

In fact even as I edit on a day-to-day basis I make use of display and design conventions all the time, but much of it operates at a subconscious level. For example some are cultural – I read and write from left to right and some have been decided for me (the DMXzone typeface was decided upon before my arrival), I **embolden** certain words to make them stand out.

Then, while I was surfing the Web, I came across a reference to **eyetracking**, sure I've heard of it before, but combined with Linda's articles this prompted me to delve a little deeper and try to find out what eyetracking studies had been done on Web sites and what the implications to Web developers may be (of course eyetracking has plenty of [applications outside computing](#) as well). I'll return to highlight a particularly relevant part of one of Linda's articles at the end.

Here I aim to share what I've found in my brief investigation – feel free to share any of your insights by adding comments to the bottom of the article.

A Bit of Eyetracking Background

So what is eyetracking?

Eyetracking is the monitoring of where a person is actually looking. It can be achieved by use of different types of technology including using cameras that follow a person's eye movements. As [Eyetools](#) – one of the leading companies involved in carrying out eyetracking investigations – tells us:

"Human eye movement is characterized by rapid movements to a location (saccades) followed by momentary pauses of the eye (fixations). Fixations typically last between 1/10 and 1/2 of a second, during which time the brain quickly processes the visual information perceived and then makes a (subconscious) decision as to what to look at next."

Quote taken from [Eyetools website](#).

So, if you can follow a reader's eyes around a screen, you can start to understand what catches peoples' attention, where the best place on a page is to place certain types of content and how readers are reacting to your content.

As an example of eyetracking analysis check out this [link](#), showing how a New York Times web page was scanned by a reader, and how the eyes scanned over the page alighting on many portions but only concentrating on a few.

Pros and Cons

Of course with any technique one has to appreciate its strengths and weaknesses – as [this page](#) indicates, eye tracking can help you to understand when a reader is scanning or reading, how interesting an item is, and whether a reader is trying to hunt down a piece of information on a page.

It can't actually tell you why a user looked at an item or even, if they looked at it, that they actually processed the information. Furthermore it may be tricky to assess the impact of peripheral vision.

Readability – Not Going There (Today)

Now it's merely a short leap from understanding how an eye moves around a page and pauses over items, to talking in detail about how to increase the amount of time spent at that item.

I'm not going to stray too far into [readability and usability](#) today – I figure it's best to confine this discussion to the structural aspects of Web page layout than delve into debates on font-size and developing text that can be easily [scanned](#).

Early Results and Implications

One study carried out in 1998 by [User Interface Engineering](#) on an effectively [three-column layout above a large single column content area](#) indicated that, at that time, users employed a visual scanning strategy that rapidly evolved from a printed book style left to right style to a **centre-left-right** approach.

Users rapidly worked out how to avoid content they didn't think they wanted and quickly acquired a mental awareness of where they expected good content to be (in the centre, probably not at the bottom of the page). This study also highlighted the influence of peripheral vision; advert borders would neatly deflect vision elsewhere, although the users seemed to be able to 'assess' the content of the ads. Furthermore, and I'm guessing this was a study that didn't use mice with scroll wheels as it was commented on, users rarely looked directly at the scrollbar even when using it.

Eyetoools are an interesting outfit, intimately linked (as far as I could tell) with the development of this area of technology. They are a spin-off arising from the [Stanford-Poynter Project](#) that also started to conduct eyetracking research in 1998 or so.

Their report released in 2000 seemed to support work that had been done in the mid-90's by [Jakob Nielsen](#).

So what did Jakob pick up on? He observed that text seemed to attract attention before graphics, that headlines should be simple and direct, that information should be facilitate fast scanning and that a site should allow fast re-orientation for users that return to it (based on observations of interlaced browsing – flipping between sites).

Now Web technologies have moved on a long way since then – mice have scroll wheels, broadband connections are commonplace, even in the home. Similarly Web design has moved on – standards-based programming and more efficient browser rendering coupled with 'accepted practice', but this practise does of course build on the early studies.

So what can we find from more recent times, that takes into account our high bandwidth using, blog reading, Web literate society?

More Recent Studies

In November 2003, UK based [The Usability Company](#) produced an eyetracking report investigating the eye movements of visitors to the sites of [three well known UK newspapers](#) (worth checking out the report for some lovely 'gaze trails' showing the eye movements across the pages).

So what did they say? I couldn't resist adding my own commentary of their observations to link in with the above section.

Firstly they reported that people learnt quickly where adverts were placed, and subsequently ignored them (*no change there then*). Secondly, that viewers expect navigation to be placed on the left and are happier scanning vertically than horizontally (*Web literacy?*).

They noted advertising placed in the body of the site had a greater chance of being recalled than if it was placed at the sides or top, and that the presence of animated adverts was recalled but not always the content (*centre field preference and avoiding the extraneous maybe, peripheral vision will 'force' some degree of viewing of ads placed within the text being read?*).

It was observed that viewers' eyes were attracted to images and headlines over block of text, and that by and large a centre-left-right page scanning approach was used. *Some minor variations here but pretty much the same.*

Interest from the Snake Oil Salesmen

OK, so the title is gratuitously rude, and hypocritical into the bargain given the line of work I'm in, (still it might have got your attention - make that doubly hypocritical I'm trying to stay away from readability), but for anyone trying to convince advertisers that online advertising really does work, honest, such eye tracking reports are vital.

The Usability Company report, highlighted above, suggests that template driven sites might fall into a trap of allowing the user to avoid 'irrelevant content' if it always appears in the same place. Hence it may be advisable to allow adverts to be positioned at different places on different pages.

The ad industry analyst [Ajay Segal noted](#) in 2002 that MSN, Terra Lycos and CNET had all used eyetracking studies to help them improve their ad viewing. One outcome being that Lycos moved their top ad banner **below** their top horizontal navbar. Apparently this really increased the ads viewing figures. Mind it's not in that position now so that can't be the full story!

Here the issue of viewers quickly being able to ignore undesirable content was highlighted. The solution suggested here is not just to move ad position, but also vary the ad's [size and shape](#).

An Aside I – Child's Play

This [article](#) (OK I give up trying to avoid the subject of readability; it contains the longest paragraph I have seen for a long while) refers to an eyetracking study carried out on small children viewing the [Teletubbies web site](#). Apparently small intricate items like faces held the attention better than flashy animation.

An Aside II – Cultural Appreciation

While reading a page discussing how to [build a website](#) based on visitors' expectations and behaviour I was led to this page displaying a well-known [Japanese picture of a large wave](#).

The accompanying text describes how Western left-right viewing and Eastern right-left viewing patterns cause very different responses to the picture. Suffice to say you may wish to disagree with my description of the picture!

Making Connections

I started off this article talking about Linda's articles – well the extract that really made me think about my eye moving over a screen, concerned **movement**.

In her [deconstruction of Kate Rusby's website](#), Linda talked about how, when you first log onto [Rusby's site](#), the animated Flash line drawing draws the eyes to one end of the screen. However, because of the position of the image, coupled with the direction of Rusby's gaze, our eyes are naturally drawn back across the screen to look at the left most of three columns.



Movement created by directional cues

As Linda points out in her article this gaze has forced (even Western readers) to eye track from right to left. Furthermore, and relevantly to the discussions above, we are led to the left most of three columns not the central one.

For comparisons of vertical and horizontal scrolling, as The Usability Company report talked about, try looking at these two sites from CSS Zen Garden and thinking about which you find easier to read:

- [Punkass](#)
- [15 Petals](#)

If this article has stimulated your mind a little, keep an eye out for a new [report](#) on the eyetracking of more news site readers that should be released soon!

Over the course of the article I've reflected on my own ability to 'tune out' adverts and the general uniformity of blog structures and the positioning of all that important content. I've also realized that subconscious viewing behaviour leads to the adoption of conventions that you tamper with at your peril. However understanding **how** those conventions arise may enable you to subvert them with clever design.