A brief overview of fonts and their potential impact on literacy

Introduction

Most parts of the world no longer rely on oral traditions as the sole means to communicate and share knowledge as we once did. We have vast tools available to produce the written word which can then be widely read and shared. Two of those tools are the personal computer and word processing software which present to us a number of choices in how to present our thoughts and ideas. We can easily choose and change the font, font size, line spacing, margin sizes, and so on. Chappell and Bringhurst (1999) raise the idea that the computer has made people more aware of type and typography. This is probably true as I do not recall concerning myself with the font used on the typewriter I purchased thirty years ago, nor do I remember having an sort of awareness of the sort of type it produced.

It may be somewhat common sense to recognize that design elements such as font size and line spacing would impact the perception and/or accessibility of a written passage (ie. large font print materials for the visually impaired), but it is not as obvious whether a choice of a specific font could impact the reader.

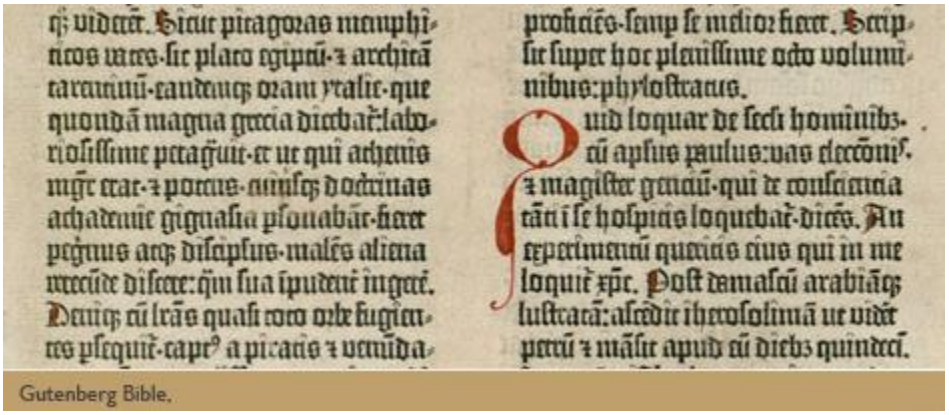
For this project, I choose to explore the history of fonts, and consider the effect they might have on literacy and education, giving specific attention to serif versus sans serif fonts. This will be an extremely brief introduction to the topic. Entire books exist to flesh out the details of font history and use in design. However, I suspect that few people beyond graphic designers and typographers have given thought to the topic. Even fewer, I suspect have any notion that changing font, without changing other typographic elements, may influence how one processes

written material. This essay is intended simply to bring an awareness to the topic and to, hopefully, pique some interest.

A (very) brief history of fonts:

A font is defined in the Merriam-Webster dictionary as "an assortment or set of type or characters all of one style and sometimes one size" (www.merriam-webster.com/dictionary). Fonts have existed since the beginning of the written word. In fact, hieroglyphics could be considered a font. If we skip ahead in time to fonts used in print, we would need to begin with Gutenberg and the printing press. Gutenberg used fonts that mimicked the handwriting of the day, (Figure 1) going so far as to cut each letter in varying thicknesses so they were not exactly the same, just as written manuscripts would be (Friedl, Ott & Stein, 1998). This type is currently known as Blackletter and it was used throughout Western Europe from approximately 1150 until the 17th century, but for other countries until the 20th century (https://en.wikipedia.org/wiki/Blackletter).

Figure 1:



Gutenberg Bible.

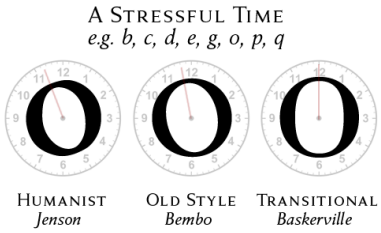
Source: (https://ilovetypography.com/2007/11/06/type-terminology-humanist-2)

In the late 1400's the Humanist style appeared. These types were based on the handwriting of Italian scribes with letters that are more rounded, lighter and flowing than the Blackletter fonts. The Humanist label is so named as such they look more likely to be done by a human hand. These fonts are less common today but served as an important ancestor to many of our modern day types.

After the Humanist style, fonts developed in the categories of Old Style, Transitional, and Modern. (This is just one way that fonts are categorized or grouped). Families of fonts are distinguished by a number of features. Some examples of these features are: the thickness of the strokes and whether they are even throughout a letter or vary, the "x height", which is the distance between the base line and the mean line of lower-case letters, and the slope or angle of the letter and/or its lines, for example, whether the bar on a lower-case "e" is straight across or on an angle. Some of these features are very similar, making it difficult to discern one font from another. Examples of a Humanist font and an Old Style font are shown in Figure 2. A careful look reveals some differences, but at first glance, it is difficult to see that these fonts are different enough to be categorized in completely different "families". Figure 3 shows how the orientation of the letter varies across three different families or types.

Figure 2:

Figure 3:



Source: https://ilovetypography.com

With the differences between some fonts so minor, one is left to wonder why someone would have bothered to create a font so similar to one already in existence. That question remains unanswered for me. Some fonts, however, were created with purpose in mind. Italics appeared in 1501 and are thought to have been created for small format or pocket books where space limitations required a more condensed font. (Boardly, 2016). King Louis XIV, in 1962, commissioned the creation of the Royale du Roi font for the exclusive use of the royal printer (https://www.britannica.com/topic/Romain-du-Roi). Some fonts have been developed by designers who were simply interested in personalizing and creating.

In modern day, the way characters are displayed on a screen affects their readability as compared to print. Anyone of a certain age, will remember how text used to look on a screen:

The popularity of laptops shows that people are eager to use mobile technology. Windows XP Professional is designed to make mobile computing easier. New features for mobile computing will help you accomplish as much on the road or at home as you do in the office, so you can be productive no matter where you are.

Source: https://docs.microsoft.com/en-us/typography/cleartype/ *Source: https://www.vectorstock.com /royalty-free-vector/pixel-retro-font-8-bit-alphabet-vector-20557143*

To bring online reading more inline with print, fonts have been specifically designed for computer/online use. Georgia and Verdana are two such fonts, both commissioned by Microsoft and designed for screen display in the early 1990s. Some features of these fonts that

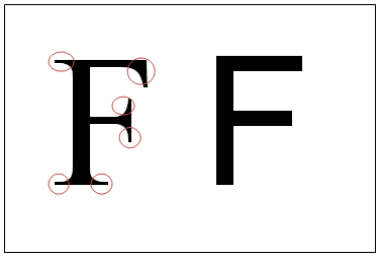
make them more readable from a screen are relatively large x-heights and extra space between letters so that they do not touch. Special attention was also given to differentiate characters that are often confused such as the number one, lower case l, and upper case I (Boyarski, Neuworth, Forlizzi and Regli, 1998). In Verdana, those look like this: 1, l, I and in Georgia 1, l, I.

Fairly recently, Microsoft developed ClearType, a software development, to improve the crispness of letters displayed on LCD screens. The challenge now extends beyond the PC screens to hand-held devices. Microsoft represents that this technology makes onscreen displays "almost" as crisp as printed text. (https://docs.microsoft.com/en-us/typography/cleartype/).

The impact of font selection on literacy and education

With the range of fonts available, it seems there are endless possibilities to research the impact they have on readability, reading comprehension and so on. Those findings could then be used to develop best practices or to create fonts to resolve literacy problems. For example, in 2008, Christian Boer created a special font "Dyslexie" that was intended to facilitate reading for individuals with dyslexia. Unfortunately, research has been unable to confirm any benefit to this font as compared to Arial. (Marinus, Mostard, Segers, Shubert, et al., 2016). Certainly, font size has been used to assist with visual impaired, but there are other reasons that children and adults struggle to read that perhaps could be solved or improved upon with the right kind of font.

Most research seems to be focused around the use of serif versus sans serif fonts. This is a classification that exists between fonts that has yet to be mentioned. Since beginning this project and researching the topic, I asked approximately 10 colleagues and students if they knew what the distinction was between serif and sans serif. Everyone was familiar with the terms, but nobody knew what a "serif" is or what the distinction means. For clarity, a serif is described by Bringhurst as "a subsidiary stroke. It can emphasize a stroke end, by enlarging it or capping it off….(it) can also do the opposite: deemphasize a stroke end by tracing the entry or exit of the pen." The following are simple diagrams pointing out serifs.



Source: *https://www.quora.com/What-is-the-difference-between-serif-and-sans-serif-typefaces*

Sans serif fonts have been found in inscriptions as far back as the seventh century B.C., however, they were a late development in printing. William Caslon created an unserifed font for Oxford University Press in the mid-1700's however, sans serif fonts were common only in advertising in the mid-nineteenth century (Chappell & Bringhurst, 1999). Eric Gill created Gill Sans around 1927, created in the Humanist style and the next sans-serif font did not appear until 42 years later, in 1969, when Syntax was released. These fonts were seldom used by typographers for books as they were lacking certain characters that made them unsuitable for printing. (Chappell & Bringhurst, 1999). In the 1990s, several fonts were issued that included

both serif and unserified fonts with a full typographic palette, increasing the popularity of the sans serif font.

Common fonts in each category are (shown in their respective font):

Serif	Sans Serif
Times New Roman	Arial
Georgia	Comic Sans
Century Schoolbook	Tahoma
Courier New	Verdana

Serif fonts have traditionally been considered easier to read. One possible reason is that the serif makes letters more distinct and identifiable (Moret-Tatey & Perea, 2011). However, as Moret-Tatey & Perea (2011) point out, serifs are not an inherent feature of letters and the extra stokes may act more as visual "noise". Further, the presence of serifs reduces the space between letters and that may slow down reading. Interestingly, advertisements and traffic signs are normally in a sans serif font which seems to suggest that somewhere along the way, it was decided that sans serif could be read more quickly as a motorist passes it by.

One research study concluded that sans serif fonts increase reading speed, but not reading efficiency. Bernard, Lida, et al. (2019) examined the fonts in the above table for reading effectiveness, reading time, perceptions of font legibility, font attractiveness and general preference. They found there was no difference in reading efficiency (a combination of reading time and accuracy). The fastest reading times of the eight fonts were found with Times and Arial, one being a serif font, the other sans serif, which might suggest the difference between the two categories, more broadly, is negligible.

In another study, Kaspar, Wehlitz, von Knobelsdorff, Wulf, et al. (2015) looked at the effects of serifs when reading scientific abstracts on a computer screen. They concluded that missing serifs leads to increased reading speed, however, the presence of serifs increased the rating of overall appeal of the abstract as well as the perceived quality and importance of the research. The authors also conclude that the potential impact of text fonts has been widely neglected to date.

Other studies were consulted in this process, however, there simply is not the space to summarize them here. The overall impression is that sans serif fonts generally are read more quickly but serif fonts, by being read more slowly, may result in other benefits.

Conclusion:

A search of the internet to find how many fonts exist today returns results of 160,000 to 300,000 to nobody really knows. Whatever the number is, it most certainly will be growing in real time. Programs such as Fontographer are available that allow one to create their own font. It is even possible to have a font created in the image on one's own handwriting.

Although sans serif fonts arrived on the historical scene only relatively recently, they are becoming more popular. One piece of evidence to this effect is that the default font for Microsoft Word used to be Times New Roman, a serif font, but it is now Calibri, a sans serif. (Moret-Tatay & Perea, 2011).

Font selection is just the beginning of all the typographic choices one could make. As educators, it would be useful to become familiar with the influence these choices have on our students and their ability to consume printed media whether on paper or on screen.

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