

HCIN 620 Information and Interaction Design
Type and color and color
Spring 2015

The title above is not a typographical error. I'd like to discuss two completely different uses of the word color, as well as type.

Changes in type over time. Typography began in earnest in the 1450s. (There had been typesetting in China 200 years before this but the art invented there was never communicated outside a small community and was not widely known until archeologists in the the 20th century rediscovered the long-lost artifacts.)

The earliest use of type was to emulate handwriting. The earliest type founders (people who made type) imagined that the human hand represented the zenith of writing and that the best a typographer could do would be to emulate human handwriting or calligraphy. This pattern is repeated in many art forms such as filmmaking where some early filmmakers attempted to emulate theater rather than recognizing film as a distinct medium.

The first famous type founders are those who recognized the technical characteristics of type that distinguish it from handwriting. For example, Prior to the contemporary era, type was realized on elements that would wear out after being used a number of times.

It was expensive for printers to purchase sets of type. Benjamin Franklin, for instance, purchased a couple of sets of type made by William Caslon in England, had them shipped to him in Pennsylvania, and produced most of the early copies of the circulated documents of the United States using them. So a printer would keep using one set of type through various stages of image degradation. A great type founder was, in part, one who could create type that would degrade gracefully. It was desirable to printers to have type that performed similarly when new as after extended usage. William Caslon was especially good at this and, to this day, typefaces bearing his name are used to produce documents that connote historical importance.

Another aspect of typography has to do with the materials used. Prior to computing the relationship between paper, ink, metal or wood surfaces, and machines to blend them were highly variable. The ability to work with various tools was important and difficult. For example, type founders like Firmin Didot and Giambattista Bodoni, developed type with hair thin lines and extremely broad lines. It is quite difficult to apply ink evenly to cover both kinds of line. It is also problematic to make the type degrade gracefully and requires a more extensive understanding of tools and materials to create durable type.

VITA NUOVA da DANTE

Nove fiate già appresso lo mio nascimento era tornato lo cielo de la luce quasi a uno medesimo punto, quanto a la sua propria girazione, quando a li miei occhi apparve prima la gloriosa donna de la mia mete, la quale fu chiamata da molti Beatrice li quali non sapeano che si chiamare. Ella era in questa vita già stata tanto, che ne lo suo tempo lo cielo stellato era mosso verso la parte d'oriente de le dodici parti l'una

FIGURE 1. LA VITA NUOVA

A facsimile of lines from Dante's "La Vita Nuova" demonstrates a contemporary interpretation of Bodoni's ideas. It is available as "Bodoni vita nuova facsimile sepia" by James Arbogast - Own work. Licensed under CC BY-SA 3.0 via [Wikipedia](#).

That document was first published with Bodoni types by the Officina Bodoni in 1925. The actual font in the figure is the digital Bodoni Monotype published in 1999. A key change in the last century has been the opportunity to precisely reproduce a given typeface. Now typefaces are named and somewhat uniform. The typefaces named after Bodoni, Garamond, Baskerville, Goudy, and

other past masters, represent contemporary interpretations with considerable less variability than the originals on which they are based. The masters of the 1700s and 1800s had no way to reliably reproduce their own type.

Challenges for type. Traditional typography for a given page of a book represents three widely recognized challenges, legibility (distinguishability of each letterform), readability (of the entire page), and color (technical term used to mean ink density).

Sites like [typomil](#) detail the parts of a letterform that concern typographers. Changing these parts changes legibility (distinguishability of each letterform), but also affect readability and color. For instance, serif brackets shaped like arrows can help the eye move from right to left or left to right, depending on the language, but make each letter look more like the other.

Reading psychology. This a sub-discipline of cognitive psychology that is the source for many studies of reading comprehension and comparisons of various contributors to reading comprehension, including typography.

I once had the opportunity to speak to a major figure in this field who had his own lab at Microsoft Research. I asked him why so many studies in his field seemed to directly contradict each other. As an example, for every study claiming serif types to be superior to sans serif types for reading, another could be found making the opposite claim.

He responded that he believed that the human brain can generally overpower bad design by an order of magnitude, such that many effects found in reading studies are not stable and not reproducible in future studies. He added that he was quite interested in the traditional beliefs of typographers, typesetters, book designers, and printers. He suspected that their accumulated wisdom was worthwhile even if not uniformly reproducible in controlled studies.

This researcher told me that there were some reproducible effects, but fewer than might be popularly supposed. He felt that his field was in its infancy and just finding its way and that it might be

misleading to rely too much on any individual study.

If what this researcher said is true, should we keep an open mind about research findings or simply denounce them all. The popular media has, of course, chosen the latter approach and the blogosphere is filled with fatheads telling you that this typeface is better than that typeface and that you should use this or that typeface. I suggest that you run away from such blowhards as fast as you can and instead try to identify mechanisms at work in the use of type. Once the words *better* and *should* come into play, you may as well start playing dice games.

Type in a menu. In the film *AI* (2001), the character portrayed by Jude Law is invited to choose from a context sensitive menu by the holographic cartoon Dr. Know, as voiced by Robin Williams (who coincidentally provides material for the Extreme Emphasis exercise). When the Jude Law character asks about a concept, Dr. Know asks for the context in which he asks, since the concept has different meanings in different contexts.



FIGURE 2. ART NOUVEAU CONNOTES FAIRY TALES

The menu provided for context includes fairy tales as among the contexts and portrays the words *fairy tale* in an Art Nouveau typeface. Why is this? Fairy tales were a preferred theme in Art

Nouveau, with its fantastic colors, landscapes, and supernatural figures.



FIGURE 3. BASIC WRITING CONNOTES PRIMAL

The word *primal* may mean many things but is likely here to refer to the psychological definition, here given by Google: *of, relating to, or denoting the needs, fears, or behavior that are postulated (especially in Freudian theory) to form the origins of emotional life.* The most basic writing associated with early learning of writing may suggest the same period in development.

Believe it or not, small caps differ from other capital letters. In a full type family, you should not be able to find an exact match for a small cap among the standard uppercase letters. They are an exaggerated form of uppercase letters and contain features somewhat large in proportion to letter height. In the era of printed materials, typographers eschewed the use of boldface type in favor of small caps and italics. The reason for this has to do with the disparity in ink laid down by boldface type with others. This is both technically difficult and disturbs the color (in the typographic sense) of a page. Hence, many encyclopedias, dictionaries, legal books, and other artifacts of officialdom make extensive use of small caps.

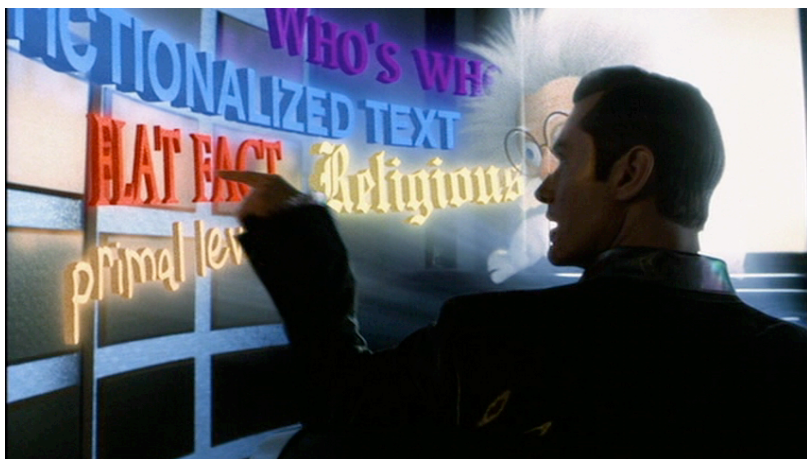


FIGURE 4. SMALL CAPS CONNOTES OFFICIALDOM

It is the disturbance of page color that has forced me to use boldface type in these lecture notes. I used to use only small caps and italics for emphasis or headings. Students insisted that headings using these devices were invisible and that, for instance, they did not know how much to read before an exam because they could not tell where one chapter ended and another began. The boldface headings here are my way of compromising with such students, whose rejected demands included Helvetica, endless white space, callouts repeating the important points, underlining of important vocabulary, and fewer words overall. On the other hand, I also had a student claim she missed answering questions on the last page of an exam because she was confused by the staple being on the right side when all other teachers put the staple on the left side. I have not compromised on staples. I just don't know how to control the printer.

Because of the early liturgical emphasis of typography, there are vastly many variations of type for religious texts. The most general term for these typefaces is blackletter.

Die Neue Typographie. You can google *tschichold posters* to see examples of this movement of the early twentieth century, spear-



FIGURE 5. BLACKLETTER SCRIPT CONNOTES RELIGION

head by Jewish artists working in Germany like Jan Tschichold. Like the Gestalt psychologists and the artists of the Bauhaus, they were driven out of Germany in the nineteen thirties. The Nazis banned the use of what they called the *Schwabacher Jew letters* used in books such as prayer books and missals, as well as much *decadent* artwork, including posters using the Neue Typographie. After the war, Tschichold rejected Die Neue Typographie, saying that the severity of its pronouncements reminded him of the severity of the Nazi pronouncements about typography. This example suggests that typography may be intertwined with social and political upheavals as much as any other art form.

Chunking words, especially in menus. We've previously discussed Hick's law, which predicts the time it will take for a user to make a choice, given the number of choices. Hick's law can be expressed similarly to Fitts's Law as

$$t = b \log_2(n + 1)$$

Here, t is reaction time, b is a constant to be found empirically, and n is the number of choices with which the user is confronted.

The extra 1 represents the concept *none of the above*.

An important publication of 1956 influenced thinking about appropriate chunk size forever after.

First, the span of absolute judgment and the span of immediate memory impose severe limitations on the amount of information that we are able to receive, process, and remember. By organizing the stimulus input simultaneously into several dimensions and successively into a sequence of chunks, we manage to break (or at least stretch) this informational bottleneck.

Above is a quote from Miller (1956), a milestone article that has led many people to chunk choices into groups of seven, plus or minus two. I attended a talk by the author once in which he said that this article made more modest claims than its adherents. Miller said he was appalled at how popular literature has twisted the original article to shoehorn all kinds of choices into groups of seven, plus or minus two. He said that he had studied a limited number of cases and was modest in his conclusions.

COLOR

Color is an enormous concept. It can be the subject of entire semester-long courses in several disciplines, including psychology, neurology, biology, and optical science. Therefore I would like to limit my discussion to two issues among the very many that should be of interest to you as designers. The first is education about color and the second is color words.

Education about color. Josef Albers was without peer in educating art students about color in the twentieth century. His kit, often referred to as a book, is called *Interaction of Color*. I had read a popular paperback edition of the book years before I ever saw the actual kit, which consisted of a box full of colors on various kinds of paper, cardstock, and other materials, along with a guide book, a version of the paperback I had read.

Albers conceived of education about color as putting different color cards together in different configurations and examin-

ing the effects of these configurations on the student's perceptions of color. This kind of education can not be conveyed in a book alone. It is difficult not only to rearrange the colors but also to control the actual printed colors. Believe it or not, it is quite expensive to reproduce intended colors with any kind of precision in a mass printing. No wonder William Blake preferred to produce his books by hand! (Okay, he had other reasons, including the desire to master all the related arts and the desire to ensure that the final product would have a luminous quality achievable only with the use of watercolor.)

There is now at least one version and perhaps more versions of *Interaction of Color* available electronically. For years it was a daunting task because only the most expensive monitors could reproduce colors well. Now it seems that at least someone believes in the color fidelity of the iPad enough to release the rights to produce a version in that medium.

Color word research. Following are quotations from [color word research](#) contributed by a previous student.

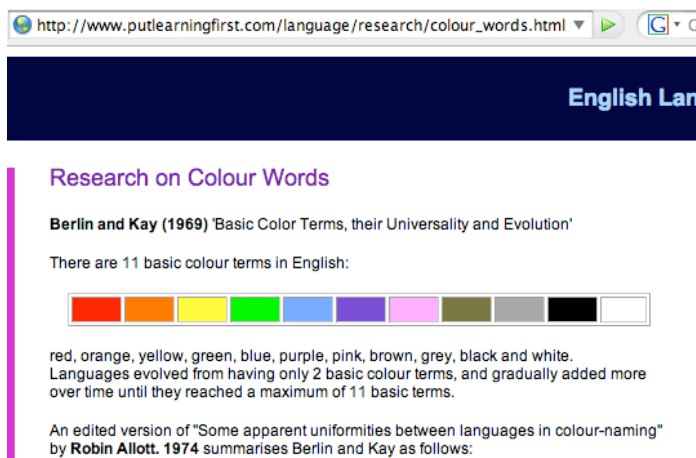


FIGURE 6. COLOR WORDS

The website shown in the figure continues as follows:

A prominent doctrine in linguistics and anthropology holds that each language and culture expresses a unique world view by its particular way of slicing up reality into named categories. (See Sapir-Whorf hypothesis).

This says that it is difficult to make exact translations between languages because hearers see the world in a way governed by their own language.

Colour vocabulary is a possible example of this.

According to accepted doctrine, basic colour words are not translatable across languages.

Analysing ninety-eight languages Berlin and Kay (1969) found that eleven colour words act as focal points of all the basic colour words in all the languages of the world. This set of eleven seems therefore to be a semantic universal. Basic colour words *are* translatable.

They also found that words for the basic colours arose in different languages in a regular sequence:

- all languages with only two basic colour words have words for black and white;
- languages with exactly three basic colour words have words for black, white and red.

Exercise. Extreme Emphasis. From *Making Comics*, Chapter 3, page 157, exercise number 5: create about eight panels in your sketchbook from the Robin Williams monologue in the extreme-emphasis.mp4 video. This is also available on Youtube under the title, *Good Morning Vietnam - First Time on Air*. Your goal is to letter the monologue in a way that conveys the extremes of expression in the comedian's voice and face. The drawings and continuity are not the issue here—any eight moments from the sequence will do. Note that you are not asked to draw pictures of a person, a microphone, a room, nor any other representation that the comedian mentions. You are being asked to draw pictures of the words

themselves. Icons or pictures that support the words are okay, but the depictions of the words is the central theme.

Please enter these panels into your sketchbook and expect them to be evaluated when I collect the sketchbooks on the last class day.

REFERENCES

Miller, George A. 1956. "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information." *The Psychological Review* 63: 81–97.