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THE ABC'S OF FONT

EFFECTS OF CHANGING DEFAULT FONTS

A Thesis

Presented To

Eastern Washington University

Cheney, Washington

In Partial Fulfillment of the Requirements

for the Degree of

Master of Arts in English

Rhetoric and Technical Communication

By

Amanda P. Erickson

Spring 2013

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MASTER'S THESIS

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Introduction

Fonts have been around since ancient Roman times. Recently they have gained higher levels of interest and use. Today, as a result of the capabilities of our technologically savvy generation, thousands upon thousands of different fonts are available for free downloading. With so many different options, it is hard to know which font is the best choice.

When Microsoft originally distributed Times New Roman, they didn't expect it to become the most recognized and regularly used serif typeface in world. However, it went on to become the default font in Microsoft Office applications for a decade. When the default typefaces for Microsoft Word changed in 2007, the way Microsoft Word users designed documents changed. Instead of having the famous Times New Roman typefaces as the default font, they now had Calibri. A sans serif replaced a serif.

While the change affected most writing and education students, those users who just open a software application and quickly compose a document will hardly notice a difference, as Kimball & Hawkins (2008) note, "Most people don't pay much attention to typography when they create documents. They simply open a word processor and type, accepting whatever defaults the program gives them" (p. 151).

Research shows that sans serif typefaces are best to be viewed onscreen while serif remain the best for printed documents. This fact has not changed, but the end purpose of documents has changed, along with technology. Instead of printing most documents, users have been viewing them mostly onscreen, thanks to the popularity of the Internet and email. There have been many studies on the effectiveness of ClearType fonts, a software technology developed by Microsoft that improves the readability of text

on screens, readability of printed and onscreen materials. However, research has not looked at how changing the default fonts in Microsoft Word 2007 impacted users. My research aims to examine users' awareness of the font they are using when composing documents.

For my research, I investigate the following questions: What influenced Apple and Microsoft's choices in choosing a default font for their word processing programs? What factors influenced changing the default fonts? What impact does the change in font have on users? How is font choice related to the proliferation of the computer? How does widespread availability impact usability?

As a part of this study, I review the available literature and conduct a short student survey and an analysis of event flyers found around a college campus. My findings suggest that Microsoft Word users have been affected by the default font change in 2007 that has caused them to change the font from Calibri to Times New Roman when they compose documents. The results of the event flyer analysis prove that users have some aspects of type awareness when designing the flyers.

History of Software Corporations

The ability to print with type has been around since the eleventh century. The Gutenberg Press with its wooden and later metal movable type decreased the price of printing materials and made such materials available for the masses. Type began in type foundries, where each letter of the alphabet was engraved by hand into steel (Hustwit 2008). The men who engraved the individual letters were called typographers. The Gutenberg Press remained the standard until the 20th century, when Apple and Microsoft formed and created the computer.

Apple Macintosh

Steve Jobs and Steve Wozniak created Apple Computer on April 1, 1976. For more than two decades, Apple Computer was predominantly a manufacturer of personal computers. The Apple Macintosh computer, introduced in 1984, "popularized the key technologies and concepts that would herald a new typographic age" (Staples, 2000, p. 19). The Macintosh was the result of a project to see what kind of computer could be made with $500 (Gillies & Cailliau, 2000, p. 121). It also introduced the public to the idea of "what you see is what you get, (WYSIWYG)." because of bitmapped fonts and dot matrix printing (Staples, 2000, p. 19). Bitmapped fonts are fonts that are composed of several dots to make up a single character (Staples, 2000, p. 19). They helped users visualize what their document would look like after it was printed. WYSIWYG employed the use of actual-size images of document pages on the computer and the corresponding ability to print them as they appeared. "Macintosh's 72 pixel-per-inch display corresponded closely to the number of dots used to print a Macintosh file on its companion product, the dot-matrix-based ImageWriter" (Staples, 2000, p. 20). The tight compiling of image to output changed not only the way people created documents but the way they thought about them. "Computer users increasingly considered the text's appearance as central to the writing process. Early Macintosh users had the ability to choose among multiple typefaces and font families" (Staples, 2000, p. 21).

Microsoft Windows

In April of 1975, Bill Gates and Paul Allen created Microsoft. They also created and sold their first product in 1975. "Inspired by an article in Popular Electronics magazine," (Gillies & Cailliau, 2000, p. 123) they developed a BASIC computer

language for the Altair 8800. Then in 1981, IBM asked Bill Gates and Paul Allen if they could provide an operating system for their PC idea. Gates and Allen in turn bought the operating system from another company for $30,000 and licensed it. Microsoft went on to become the world's dominant software company (Gillies & Cailliau, 2000, p. 123).

Microsoft and apple join together. In 1997, Bill Gates said that Microsoft would invest $150 million in Apple and develop and ship future versions of its Microsoft Office (Kawamoto, 1997). Ten years later, Microsoft and Apple announce that they have "renewed their font licensing agreement, giving Apple users ongoing use of the latest versions of core Windows fonts" (Microsoft, 2013).

<div align="center">

Overview of Word Processing Programs

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The history of word processing programs allows us to see how the technology and development of fonts have advanced throughout the years. With the first release of each program, only screen fonts were used. Now, there are the software company's default fonts, as well as hundreds of other options.

Word For Mac

In 1985, Word was available on Macintosh computers before it was available for Windows (Bañaria). Word for Mac added "what you see is what you get" (WYSIWYG) features to the design. In 1987, Word 3.0 was released (Bañaria). Updated versions of Word for Macintosh platform were released in 1989, 1991, 1993, 1998, 2001, 2004, 2008 and 2011. Since its release in 1989, the default fonts had been Times New Roman for body text and Arial for headings. However, in the Word for Mac 2008 version, Cambria replaced Times New Roman and Calibri replaced Arial as the new default fonts.

Word for Windows

The first version of Windows was announced in 1983 and launched in 1985. Four years later, the first version of Word for Windows was released in 1989. The operating system Windows 3.0 was released in 1990, and in 1992, Windows 3.1 was released. With this operating system release, the typeface Times New Roman was distributed. Times New Roman has been used as the default in many applications for Microsoft Windows, especially the Office Suite and the web browser, Internet Explorer. In addition to distributing Times New Roman with Windows 3.1, Microsoft also began shipping Arial, their version of Helvetica. Times New Roman and Arial were the default typefaces in Microsoft Office products from 1992 to 2007. Microsoft continued distributing Word. New versions of Word were released in 1995, 1997, 2003, 2007, 2010 and 2013. Word 2003 is the most widely used version to ever be created (Kumar, 2013, p. 1).

However, in 2007, more than ten years had passed since Microsoft released Word 95, and in the four revisions, the user interface had altered little. Word 2007 made major interface changes which affected most Office users. The new ribbon toolbar sought to enhance productivity. McLean (2007) explains that the ribbon feature has proven controversial, with Microsoft's supporters hailing it as the future of user interfaces and its critics arguing that the move is simply an arbitrary change intended to derail any familiarity with its free competitors (p. 1). According to Bugden (2006), Word enables users to write and publish directly to a blog and has a contextual spell checker. Interestingly, Microsoft said it allocated 60% of the marketing budget in 2007 to online when they had previously allocated about 30% of the marketing budget to online for the last major Office campaign in 2005. Microsoft said the reason for driving people to the Internet was so users could experience the product (Maddox, 2007, p. 14). This is the

year the default fonts changed in the Office Suite. The defaults went from Times New Roman, a serif typeface, as the body text and Arial, a sans serif typeface, for headings to Calibri, a sans serif typeface, for body text and Cambria, a serif typeface, for headings.

AppleWorks & Apple Pages

The original AppleWorks was one of the first integrated office suites for personal computers that featured a word processor, spreadsheet and database merged into a single program. It was released in 1984 by Apple for the Apple II family of computers. Updated versions were released in 1986, version 2.0, 1989 version 3.0, 1993 version 4.0 and 1994 version 5.0. In 2000, AppleWorks 6 was released. AppleWorks 6 was the long-awaited revision of the integrated suite formerly known as ClarisWorks. ClarisWorks was another software company that eventually merged into AppleWorks in 2000 (Tsai, 2000, p. 1). The word processor was the most important AppleWorks module. It supported the usual formatting features, as well as paragraph and character styles with outlines, tables, sections, and footnotes. It also had an integrated spell checker and thesaurus (Tsai, 2000, p. 5). However, in 2007, Apple decided to discontinue AppleWorks and replace it with a new software package called iWork (Ogg, 2007, p.1). The default fonts used in versions 1.0 to 4.0 were screen fonts. However, in versions 4.0, 5.0, and 6.0, Helvetica 12 point became the default.

Inside of iWork was Pages, a word processing and page layout program that runs on the OSX operating system. Pages was marketed by Apple as an easy-to-use application that allowed users to quickly create documents on their computers. Battersby (2005) explains that Pages is an application that "behaves like a word processor, but one with powerful graphic and media handling capabilities" (p. 62). The most recent version,

Pages 4 was released in 2009. Like AppleWorks, Pages' default font in all releases has been Helvetica 12 point.

<center>**Availability of Fonts**</center>

Pre-Digital

Before there were computers and printers, there was type called movable type. Movable type, developed in China in the eleventh century CE, first took the form of carved wooden blocks, one for each symbol to be printed (Kimball & Hawkins, 2008, p. 155). However, moveable type was not useful in China (Lupton, 2010, p. 13). Johannes Gutenberg is credited with the invention of moveable type in Germany in the early fifteenth century. His invention revolutionized writing in the West. "Scribes had previously manufactured books and documents by hand, printing with type allowed for mass production" (Lupton, 2010, p. 13). Goudy (1940) explains that "although the first types were based on the scribe's writing, type forms gradually drew away from their models as printers discovered that one shape was as easy to create and print as another" (p. 39). This could be why there are so many Roman typefaces that are very similar to each other. One person created a brilliant design, and then more people saw it and copied the design but added their own tweaks to it to make it their own, unique design.

Before digital creation and distribution, there were few typefaces. Shaw (2007) explains, "In the days of metal type, the purchase of a typeface and its range of sizes represented a substantial investment that could only be recouped by continued use over years, or even decades" (p. 60). Because type was so expensive, the American Typographers Association passed a resolution at its annual convention in September 1929. The resolution was to "pass judgment on all new typefaces offered from either

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domestic or foreign sources, and to recommend such faces as are in their judgment of value to the art of typography and the science of advertising" (Shaw, 2007, p. 60). The resolution didn't hold and eventually type houses ceased to exist. In the 20th century, personal computers came into homes, and it was the start of the desktop publishing revolution. Schriver (1997) states that the "commercial success of desktop publishing has led to the development of thousands of type families for the computer" (p. 254). Today, anyone who is able can make and distribute their own fonts.

Digital

In the 1980s, designers began to create documents with computers, using word processing and page layout programs. Since the invention of the personal computer, the technology involved has changed how users create and obtain fonts. Typefaces are no longer manufactured using metal letters. Instead, they are being designed on a computer screen and then distributed through popular software companies. The digital type used in these programs led to a renaissance in type design. Nearly anyone with an interest in typography could become a type designer using a desktop computer and relatively inexpensive software (Kimball & Hawkins, 2008, p. 156). It is much easier to design type today with computers and technology than it was in Gutenberg's day. It is also much easier to use type today as well. We do not have to use individual letters for typing. We use a simple keyboard and the letters appear on the screen in the order that we press them. There is no heavy lifting of type materials, typesetting or different letter forms for upper and lowercase letters. The usability of type has dramatically increased since the creation of digital type.

Lupton (2010) states that in the "mid -1980s, personal computers and low-resolution printers put the tools of typography in the hands of a broader public" (p. 29). Lupton (2010) continues that during the early years of the web, designers "were forced to work within the narrow range of typefaces commonly installed on the computers of their end users. Since then, several techniques have emerged for embedding fonts within web content or for delivering fonts to end users when they visit a site" (p. 72). Similarly, Kinross (2004) explains that the Internet "provides the platform for this enlarged and changed culture of typography" (p. 182). Kinross (2004) also explains that the domain of typography has opened up as never before, and there is much wider interest in the activity now than there was twenty years ago (p. 182). In addition, Lupton (2010) explains "critics of electronic media have noted that the rise of networked communication did not lead to the much feared destruction of typography or even to the death of print, but rather to the burgeoning of the alphabetic empire" (p. 100). The computer display helps with communication because it is more hospitable to text than the screens of film or television since it offers physical proximity, user control and a scale appropriate to the body.

Schriver (1997) explains that most of the classic typefaces "have been redesigned for desktop design to maximize their legibility, thus minimizing the worry in using them" (p. 287), and that "many of today's digital typefaces have a range of weights available such as light, light italic, semibold, semibold italic, bold, bold italic, black, black italic, ultra black, ultra black italic" (p. 267). While the technology of producing typefaces has changed, type is still being produced and distributed each day.

<center>**Overview of Main Font Types**</center>

1975-1985: Bitmapped Fonts

The Macintosh Operating system gave users, by default, the ability to choose

typefaces and font families that could be installed into the system file. In addition,

"Macintosh applications included standard options for rendering type as "plain text,"

bold, italic, underlined, and shadowed in a range of sizes, usually 10 to 24 points"

(Staples, 2000, p. 21). While the original Macintosh system software only supported

bitmapped fonts, the original font set was custom designed for the Macintosh and were

intended to provide a highly legible screen display. These system fonts were named after

large cities, like New York, Chicago, and Geneva. However, the coarseness of dot-matrix

printing made for degraded visual quality. This was soon changed with the introduction

of the Apple LaserWriter printer in 1985.

Bitmapped fonts were designed in harmony with the square pixel grid of low

resolution screens; in a bitmapped font, every character is represented by a particular

arrangement of pixels on the screen and has been carefully tweaked by a designer for

optimal readability and clearness. The earliest bitmap fonts were only available in certain

optimized sizes such as 8, 9, 10, 12, 14, 18, 24, 36, 48, 72, and 96 points, with custom

fonts often available in only one specific size, such as a headline font at only 72 points

(Apple, 2012). Bitmapped fonts are faster and easier to use in computer code but are non-

scalable, requiring a separate font for each size.

Apple was quick to take advantage of bitmapped fonts to increase the readability

of on-screen text. Looking back at an earlier list of included fonts for the Mac, it is easy

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to tell which fonts are the bitmap screen fonts because they mostly have city names; e.g., Geneva (for Helvetica), New York (for Times), Monaco (for Courier) (Apple, 2012).

On Microsoft Windows, bitmapped fonts could be recognized by their distinctive red and white icons found in the Windows/Fonts folder. Bitmapped fonts in MS Windows tend to be used for file and folder icon and windows labels (Microsoft, 2013). Examples are Courier, MS Serif and MS Sans Serif.

1985-1991: PostScript

The Apple LaserWriter enabled the Macintosh to rival offset printing through technology that greatly enhanced the appearance of type and images. The LaserWriter handled 300 dots per inch and rendered letters considerably more smoothly than the previous dot-matrix printing. This allowed more definition on subtle details (Staples, 2000, p. 21). Apple's LaserWriter incorporated technology created by Adobe Systems that would start the desktop publishing revolution by using PostScript, a "page description language" (PDL), which tells the computer how a page is to be displayed and printed. Wright (1998) explains that PostScript consists of functions for describing and positioning lines, shapes, fills, and other graphical elements and for placing and formatting text (p. 32). PostScript fonts came with two files: a bitmap font installed into the System file, and an outline font file stored in the System Folder (Staples, 2000, p. 21). PostScript was popularized through its use on the Macintosh platform allowing the Macintosh operating system to provide any application with the ability to access the fonts installed on the system (Wright, 1998, p. 32). Today, the scope of the PostScript language has made it a typesetting standard. Its popularity has forced typesetters and commercial printers to upgrade their equipment.

PostScript is not native on Windows platforms. Adobe Type Manager (ATM) is needed in order to use these fonts on Windows ME and earlier. Windows XP, Vista and 7 require a Graphics Device Interface (GDI) be installed before PostScript fonts are usable. Windows Vista and 7 come with a GDI already installed.

Adobe Type Manager (ATM) was originally created for the Apple Macintosh computer platform to allow scaling of PostScript Type 1 fonts for the computer monitor and for printing to non-PostScript printers. It is a system software component that automatically generates high-quality screen font bitmaps from the PostScript outlines in Type 1 or OpenType formats. With ATM, users are able to scale fonts without the characters appearing jagged. PostScript font support is built directly into Mac OS X and Windows 2000/XP and newer. ATM is required for all other versions of Mac OS and Windows 95 and 98 (Adobe, 2013).

1991- 2001: TrueType

Macintosh primarily used PostScript technology through the release of system 6.When system 7 launched in 1991, TrueType fonts were integrated. TrueType is a standard for digital type fonts that was developed by Apple Computer and subsequently licensed to Microsoft Corporation. Each company has made independent extensions to TrueType, which are used in both Windows and Macintosh operating systems (Adobe, 2013). "TrueType is a software system that automatically generates matching screen and printer fonts of any size as you need them, regardless of the program or printer" (Microsoft, 2013). TrueType auto-scales to generate type sizes as needed. Staples (2000) describes how a font-war ensued, with "Apple and Adobe vying with each other to become or remain the industry standard" (p. 30). Eventually, Adobe published its Type 1

standard to support the creation of non-Adobe PostScript fonts and Apple supported

Adobe Type 1 fonts in addition to TrueType (Staples, 2000, p. 30).

1996-Present: OpenType

In 1996, Microsoft and Adobe ended the font wars by together developing the

OpenType specification (Maag, 2006, p. 54). The OpenType font format is an extension

of the TrueType format and was created to add advanced typography features. It also

bridges the gap between TrueType and PostScript fonts by supporting PostScript style

outlines. Adobe and Microsoft promised greater typographic control on the web through

the ability to embed fonts in HTML documents (Staples, 2000, p. 31). In 2001, Apple

released Mac OS X. With Mac OS X, Apple began to provide OpenType fonts. While

OpenType font technology had been released in 1996 by Adobe and Microsoft as an

extension to Apple's TrueType technology, Apple decided to change the primary system

font in Mac OS X to Lucida Grande. Lucida Grande is almost identical in appearance to

the prevalent Windows font Lucida Sans. Many of the classic Mac typefaces included

with previous versions are still part of Mac OS X, including New York, Palatino, Times,

Charcoal, Chicago, Geneva and Helvetica (Microsoft, 2013). Foresman (2009) describes

the major font change in Mac OS X- Snow Leopard. "Apple dropped Monaco as the

default monospaced font, after Monaco had been included in every version of Mac OS

since System 1 in 1984. Apple replaced Monaco with Menlo."

Adobe explains the benefit of moving towards OpenType fonts. "OpenType fonts

have many advantages over previous font formats because they contain more glyphs,

support more languages and support rich typographic features such as small caps, old

style figures, and ligatures — all in a single font" (Adobe, 2013). OpenType is the new

font standard that "contains all the font's necessary information to display and print," is scalable, and can be used on Macintosh and Windows computers, which eliminates many cross-platform problems that can occur (J.H., 2004, p. 38).

2007 – Present: ClearType

ClearType is a "software technology developed by Microsoft that improves the readability of text on existing LCDs, such as laptop screens, Pocket PC screens and flat screen monitors. With ClearType font technology, "the words on computer screens look almost as sharp and clear as those printed on a piece of paper" (Microsoft Typography, 2009). The extra resolution increases the sharpness of the tiny details in the text display, making the type much easier to read over long periods of time because the RGB pixels are being read individually instead of all at once. In January of 2007, the six new ClearType Collection fonts were shipped in Windows Vista as well as Office 2007, which automatically set ClearType fonts as a default. This switch had many Times New Roman and Arial fans upset. But there was a reason Microsoft changed defaults. Because of the increased use of the web, word-processing software companies like Microsoft have made changes to accommodate the trend towards onscreen reading. ClearType fonts were designed by Microsoft and automatically set as the default when using Office programs starting in version 2007. ClearType fonts were specifically designed to be viewed onscreen because in the mid-2000s, many documents were created to be viewed onscreen rather than in print. Microsoft realized the trend of viewing documents onscreen and not printing, which is why they decided to target their newest Office suite to the rising trend of reading onscreen.

A Trend to go Green

Microsoft also changed the default fonts in Office 2007 to reflect more of a corporate standard of the "going green" concept in addition to realizing that more communication was being done through email. Fewer documents were being printed, and at the time, there wasn't a proper font that could handle new LCD monitor technology in addition to having excellent legibility when on a backlit monitor. Regardless of the reason behind the change of default fonts, the classic business standard font Times New Roman, which had been a default since 1992, was replaced with a new, modern and technically advanced sans serif Calibri.

Microsoft explained they were trying to cut down on the cost of printing for businesses. Simon Daniels, a program manager in Microsoft Corporation's typography group says, "The more pleasing a font appears onscreen, the less likely the reader will be tempted to print" (Ramde, 2010). Daniels also said, "That's why the company changed its defaults in Office 2007 from Arial and Times to Calibri and Cambria. We are trying to move the threshold of when people hit the print button" (Ramde, 2010).

A study conducted by Printer.com simulated ink requirements using a Canon Pixma MP 210 at 25 pages per week for standard home use, and a Brother HL-2140 laser printer at 250 pages per week for business users. Arial was used as the baseline, against which nine other fonts were compared. Century Gothic was the winner, with a 31% ink savings in both home and business (Watch Your Font, 2010). Times New Roman was second and then Calibri and Verdana. In general, fonts whose names include descriptors as light or narrow use less ink. Serif fonts typically use thinner lines and thus less ink

than sans serif typefaces (Ramde, 2010). This is another reason serif fonts tend to be easier to read in printed documents: they use less ink, so the letters are clearer.

Staying Significant

When Microsoft made the new ClearType font format and changed Office's default fonts from Times New Roman and Arial to Calibri and Cambria, they were catering to user's needs with regards to the web. Times New Roman had been the default in Microsoft word for a decade (Microsoft, 2013), and it was perceived to be the industry standard since word-processing software was available. According to Tobak (2012), the once most valuable company on the planet needs to reinvent itself to keep up with the mobile and social world (p. 1).

Typefaces are more than just type on a screen or in a book or on a piece of paper. The art of typography is "an art that can be deliberately misused. It is a craft by which the meanings of a text can be clarified, honored and shared or knowingly disguised" (Bringhurst, 2002, p. 17). Likewise, Lupton (2010) states that "typefaces are an essential resource employed by graphic designers" (p. 13). Bringhurst (2002) compares typography to a musical performance by stating that "typography is to literature as musical performance is to composition" (p. 19). Typography is important not only for designers to feel accomplished with their design but also for users to be able to read and understand documents.

It's been nearly twenty years since Microsoft released Windows 95. "At a time when only two in five US households had a computer, Microsoft set out to accomplish one of the great missions in corporate history: to put a computer on every desk and in every home" (Honan, 2013, p. 110). But "the iPod, the iPhone, and then the iPad

changed the way we think about our devices. "We have entered a post-PC world. Computers have changed from being devices used at work to devices that are with us all the time" (Honan, 2013, p. 112).

Understanding Fonts

Font VS Typeface

The terms font and typeface are often used interchangeably. Technically speaking, a font is the source of the typeface. A typeface is "the complete set of characters, punctuation and symbols that share a common design" (Schriver, 1997, p. 254; Van Horn, 2004, p. 727; Wilkinson, 2005, p. 57; Kimball & Hawkins, 2008, p. 152; Harrell, 1991, p. 72). In addition, typefaces usually include four fonts: normal, italic, bold and bold italic (Harrell, 1991, p. 72). "A typeface customarily has two hundred and twenty-eight characters, including letters, accents, numerals, fractions, ligatures, commercial signs, and punctuation marks, ampersands, and peculiars, such as asterisks and daggers for footnotes" (Wilkinson, 2005, p. 57). Examples of a typeface are Arial, Segoe, Cambria or Garamond.

Traditionally, a font was the "collection of characters of a single size of one typeface" (Opsteegh, 2010, p. 15). However, a font is now considered "the entire collection of characters, punctuation, numerals, and glyphs of a typeface" (Opsteegh, 2010, p. 15). In addition, "a font is a particular version of a typeface" (Van Horn, 2004, p. 727). Kimball & Hawkins (2008) define font as "one size of a typeface, including all of the lowercase letters, uppercase letters, numerals, and punctuation. Font is also a term used to indicate the digital file for a typeface, so it's increasingly used synonymously

with typeface" (p. 152). For example, Helvetica Bold and Helvetica Italic are considered fonts.

Serif

Serif fonts are described as those fonts that have "feet," which allow for easy continuation when reading. Serif typefaces help people read long blocks of text and are commonly used in newspapers and business correspondence, in addition to many printed books and body text of printed documents. Schriver (1997) defines serif typefaces as those that have "a line or curve that finishes off the end of a letterform" (p. 255). Serifs originated with Roman masons who terminated each stroke by chiseling the edges of the letterforms with a serif in order to correct the uneven appearance made by their tools. These marks survive today as serifs, the small feet and the beginning or more commonly the end of vertical strokes. Type designers continue to use serifs not just because of tradition or convention but because serifs increase the readability of the text. Serifs are said to be useful because they help the reader's eye distinguish individual letters and provide visual continuity across words (Schriver, 1997, p. 255). In addition, Castle (1999) states that "in the United States, most people consider fonts with serifs more readable for large blocks of print than sans serif fonts" (p. 36). Examples of serif fonts are Times New Roman, Garamond and Baskerville.

Bringhurst (2002) suggests that when the "basic text is set in a serif face, a related sans serif is frequently useful for the other elements such as tables, captions or notes" (p. 105). Similarly, Kimball & Hawkins (2008) say to "use serif typefaces for paragraphs that are meant to be read through, such as those in a report of a book" (p. 163). In addition, Mackiewicz (2007) states that "historically, serif typefaces have been used for

the body text of print documents because they seem to be more readable across stretches of text" (p. 297). Using a serif typeface for a large body of text or as the main font in printed material will increase that document's overall readability.

Sans Serif

The other common type of font is sans serif. "Sans serif as a printing type made its first appearance in 1816, and became established as a recognized type in 1830 England" (Kinross, 2004, p. 38). Schriver (1997) defines a san serif face as "one without serifs," or feet, at the end of each letterform. "Sans serif faces were introduced by English typefounder William Caslon IV in 1816." (Schriver, 1997, p. 256). More specifically sans serif faces are known for having little to no variation in the stroke width of the letterforms, which provides a uniform, clean and modern appearance (Schriver, 1997, p. 256). Similarly, Mackiewicz (2007) states that sans serif fonts are "perceived as more modern than serif fonts" (p. 297). And Kimball & Hawkins suggest using sans serif typefaces when you want to direct the reader's eye down rather than across a line of type. "Most designers reserve them for shorter text objects like headings, captions, and titles" (p. 163).

Sans serif fonts are good for reading shorter pieces of information and are usually chosen for use in magazines as headings and on the web as body text. Popular social media sites, Pinterest, Facebook and MySpace, all use sans serif for their logo. Most companies use a sans serif font for their logo, even if they aren't an online company. "Sans serif fonts render more cleanly onscreen since they have less fine detail" (Josephson, 2008, p.68). Online readers chose the sans serif typeface more often than they chose the serif typeface (Jacobs, 2005). Tullis, Boynton, and Hersh (1995) also

found that subjects who were given the opportunity to rate typeface preferences preferred sans serif typefaces. However, serif typefaces were shown to be more legible, thus able to be read faster.

Additionally, Schriver (1997) explains that sans serif typefaces generally have better contrast between the plain and bolded versions of their letterforms than do serif typefaces" (p. 256). Likewise, sans serif typefaces lack the ornamentation serif type has, which makes sans serif simpler. Because they are simple, sans serif typefaces "work well for signs because their shapes are easily legible from a distance" (Kimball & Hawkins, 2008, p. 163). In addition to being a much simpler design, sans serif typefaces are an excellent choice for onscreen documents, email and even web pages. They are now the default for onscreen text. "Sans serif fonts have become the default choice of onscreen text because they have been prescribed for that use so often" (Mackiewicz, 2007, p. 297). Likewise, Castle (1999) found that many web users find sans serif easier on the eyes (p. 36). Examples of popular sans serif typefaces are Arial, Helvetica and Calibri.

Common Default Fonts

Times New Roman

Times New Roman first appeared in 1932 in The Times of London newspaper, for which it was designed. It has subsequently become one of the world's most successful type creations. It has many old-style characteristics that provide excellent legibility coupled with good economy. Widely used in books and magazines, reports, office documents and also for display and advertising (Microsoft Typography, 2013), Times New Roman was first shipped with Microsoft Windows 3.0 in 1992. It served as the default typeface in the Office Suite from 1992 to 2007, when it was replaced by Calibri.

Even though the defaults have changed, Times New Roman is still a standard when composing documents.

While Times New Roman is the "most widely used typeface in the world," it is also one of the most controversial because of its history (Eastland, 2011, p.1). According to Eastland (2011), Stanley Morison was credited with the creation of Times New Roman. However, the sole piece of surviving evidence, a brass pattern plate bearing a large capital letter B found in 1987, suggests that the real father of the font was not a typographer at all, but a wooden boat designer from Boston named William Starling Burgess (p. 1).

William Starling Burgess was born into a wealthy Boston family in 1878, and is best remembered as an accomplished naval and aeronautical designer, the builder of yachts for the America's cup and aircraft for the Wright brothers. But before embarking on his career on wind and water, Mike Parker, a leading authority on type, believes Burgess had a short but brilliant experience with typography (Alas, 2009, p. 1). In 1904, Burgess ordered the manufacture of a font series to be used for company documents at his shipyard in Massachusetts. But before Lanston Monotype could complete the order, Burgess witnessed an early flight by the Wright brothers and abandoned his interest in type in favor of aviation. His original drawings were filed at the company as Number 54 and remained on a shelf for years. Parker claims that in 1921, Lanston Monotype tried "unsuccessfully to sell the Number 54 font to a news magazine called *Time*" (Alas, 2009, p. 1). Sometime after that, Burgess's drawings fell into the hands of Stanley Morison, a type consultant at the Monotype Corporation in Britain. Morison criticized *The Times* of London for using a "chunky serif font that was hard on the eye and wasteful of ink and

paper" (Alas, 2009, p. 1). The newspaper challenged Morison to come up with something better. According to Alas (2009), Morison says that he looked to old-style fonts for inspiration (p. 1).

However, no one but Mike Parker has seen most of the evidence that supports the Burgess story. Sadly, no one else is likely to have the chance to verify his claims because in 1918, a fire tore through Burgess's shipyard, incinerating any documents that might have shed light on his activities during 1904. In 1941, a bomb blast near the London offices of Monotype Corporation destroyed much information about Morison's activities during the redesign of *The Times's* typeface (Alas, 2009, p. 1).

Mike Parker is convinced that William Starling Burgess created the font we now know as Times New Roman. However, the case that Parker makes about the real origins of Times New Roman stands on weak foundations. The sole piece of surviving evidence for this claim is a brass pattern plate bearing a large capital letter B (Alas, 2009, p. 1). The point, Parker says, is that such pattern plates represent a technology that was not used after 1915. The creation of Times New Roman was announced in 1932.

Arial

When Microsoft made TrueType the standard font format for Windows 3.1, they opted to go with Arial rather than Helvetica because it was less expensive, and they believed most people wouldn't notice the difference (Microsoft, 2013). Apple also standardized with TrueType at that time, but they went with Helvetica, not Arial, and paid Linotype's license fee. Arial has slight differences from Helvetica. For example, Helvetica's capital R has a distinctive stem. Another distinction is in the lower-case a's. Helvetica's has a tail and the bowl flows neatly back into the stem, rather than

intersecting it. Today Arial has displaced Helvetica as the standard font in practically everything done by nonprofessionals in print, on television, and on the Web, where it has become a standard font, mostly because of Microsoft bundling it with everything—even for Macs, which already came with Helvetica (Microsoft, 2013).

Arial was designed in 1982 by a 10-person team, led by Robin Nicholas and Patricia Saunders, for Monotype Typography (Macuser, 2005, p. 1). It first started as a bitmapped font developed for IBM around 1982, and was effectively redrawn towards the end of the decade to coincide with the emergence of the desktop PC market inspired by the Macintosh. The team responsible for its creation referred to its class of type as an "industrial sans" (Macuser, 2005, p. 1). They stated that it was "designed as a generic sans serif; almost a bland sans serif" (Macuser, 2005, p. 1).

Calibri

Luc(as) de Groot, a German Typographer and the head of the font foundry fontfabrik is credited with developing Calibri, a sans serif font that would use ClearType, a software based technology used to improve the resolution and display quality of fonts that Microsoft had developed. However, when designing Calibri, Groot did not have access to ClearType technology, and he was concerned that the subtle curves of his new typeface would not translate to the screen. Despite his worry, Groot's version worked astonishingly well with the ClearType technology (Levien, 2005, p. 1).

Calibri is a modern sans serif family with subtle roundings on stems and corners. It features real italics, smallcaps and multiple numeral sets. Its proportions allow high impact in tightly set lines of big and small text alike. "Calibri's many curves reveal a warm and soft character. This font is suitable for documents, email, web design and

magazines" (Microsoft Typography, 2013). Calibri was designed to take advantage of the new ClearType font technology Microsoft had developed in 2006. Thus, Calibri replaced Times New Roman as the default font in Word 2007 for Windows and future versions. Calibri is the default for headings in Microsoft Office Word for Mac '08 and '11.

Microsoft's release of Calibri and its implementation as the default font in many of their applications was met with general approval (Levien, 2005, p. 1). The ClearType collection, in tandem with the improved image technology, was seen as an important step in developing fonts primarily for digital media and screen display. "Calibri's warmth and roundedness fit well with the new millennium and the shift in business practices across the globe, reflecting the flexibility and open-mindedness of the new digital age" (Microsoft Typography, 2013).

Cambria

As with Calibri, Cambria was shipped with Microsoft Office 2007 and newer versions. It replaced Arial as the default for headings in Microsoft Word for Windows, and Replaced Times New Roman in Word for Mac 08 and 11. Cambria is a serif family that has been designed for on-screen reading and for print at small sizes. It has very even spacing and proportions. The design isn't just intended for business documents; the regular weight has been extended with a large set of math and science symbols (Microsoft Typography, 2013), making it effective for educational and research projects as well. Cambria takes full advantage of Microsoft's new ClearType font technology.

Cambria was designed by Dutch typographer Jelle Bosma in 2004, in addition to Steve Matteson and Robin Nicholas. Bosma describes Cambria as a "robust, all-purpose

workhorse text face" (Wagener, 2011, p. 1). Because of its sturdy design, Cambria is perfect for business documents, email and web design.

Helvetica

An icon of the Swiss school of typography, Helvetica swept through the design world in the '60s and became synonymous with modern, progressive, cosmopolitan attitudes. With its friendly, cheerful appearance and clean lines, it was universally embraced for a time by both the corporate and design worlds as a nearly perfect typeface to be used for anything and everything. "When in doubt, use Helvetica" was a common rule. As it spread into the mainstream in the '70s, many designers tired of it and moved on to other typographic fashions, but by then it had become a staple of everyday design and printing (Hustwit, 2008). Helvetica has been the default font on Apple applications and products since 1990.

The original Helvetica was designed in Switzerland in 1957 by Max Miediger and Eduard Hoffman at the Haas type foundry (Hustwit, 2008). Helvetica was originally called Die Neue Haas Grotesk and was closely based on Schelter-Grotesk. Helvetica was created specifically to be neutral, to not give any impression or have any meaning in itself. The marketing director at the type foundry decided to change the name to Hevetica in 1960, to make the font more marketable internationally. According to Hustwit (2008), it was originally proposed that the typeface be called Helvetia, Latin for Switzerland, but the designers didn't want to name it after a country, so it was called Helvetica, which is Latin for Swiss.

Helvetica was designed in post-war Europe, and many companies were looking for change (Hustwit, 2008). It was the opposite of all the fancy, decorative typography

that covered corporate materials and advertisements. Helvetica's sleek lines and modern sensibilities were just what companies were looking for to remake their identities and set them apart from others. Helvetica is particularly well-suited to signage and other designs where legibility is important. This is further reinforced by the wide variety of companies that have used the font in their logos or other corporate identity materials from American Apparel to American Airlines to Target.

Impact on Users

Making more typefaces available to users has made the digital type age take off at an astronomical rate. Typefaces previously were limited and only designers who had enough money for the right machine would have type. However, when opening anything up to vast amounts of people, there are bound to be complications. It is important to remember that the most important thing about designing documents is readability. Readability is defined as the "relative ease in which you can read a printed page due to type arrangement, page design and space between elements" (Brady, 1988, p. 6). "Attractive fonts are useless if readers can't decipher the message" (Castle, 1999, p. 36). Since there are now tens of thousands of typefaces available to users, many for free, it is important to use them correctly. Goudy (1940) explains the importance of choosing a typeface. "In the choice of a typeface for any specific purpose, the reasonable course would seem to be to select, first the most legible, but this is not enough for types should be pleasantly readable too" (p. 129). Similarly, Schriver (1997) identifies "two critical features of good typography: legibility and rhetorical appropriateness" (p. 249). Legibility "concerns the features of typography that make it easy for people to read text" (Schriver, 1997, p. 251). Rhetorical appropriateness is the "relationship between the

typeface, the purpose of the document, the situation and the audience's needs, desires and purposes" (Schriver, 1997, p. 283). Well-chosen typography helps to expose the content and its structure, enabling readers to see the text in ways that help them to interpret its meanings (Schriver, 1997, p. 284).

Purpose of Fonts

Fonts have many different purposes. They can be used to convey information to an audience or used as a design to interpret. The purpose of the type in a document must match the document's purpose in order to be effective. Opsteegh (2010) says that "type's main purpose is balancing the readability and legibility of your message" (p. 13). Similarly, Kinross (2004) explains that "one communicates meanings through the convention of words; meaning attains form through letters" (p. 105). In addition, Bringhurst (2002) explains that, as a rule, a face of "modest merits should be handled with great discretion, formality and care. It should be set in modest sizes with the caps well-spaced, the lines well leaded and the lower case well fitted and modestly kerned" (p. 96). In other words, take care of the type, and the type will help your audience understand your message.

Effective Use

When creating documents, it is important to design for the audience. As Kimball and Hawkins (2008) explain, "documents after all are part of the world we live in and interact with. If our designs do not take the basic dynamics of users' visual experience into account, they may be unsuccessful or even inaccessible to users" (p. 51). Effective use of fonts when designing documents is just as important. Bringhurst (2002) suggests, "Never combine two serif fonts on the same page, and never combine two sans serif fonts

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on the same page. Also, try limiting yourself to two typefaces in a document" (p. 50). Limiting the fonts used will make the document's purpose more clear and the design will look clean.

Personalities

Much like handwriting, typefaces carry personality traits with them. Goudy (1940) claims that "types, too, must have character. Character in types has to do with the impression made by the individual forms, their proportions and what makes the letters of each word hang together to form an agreeable whole" (p. 42). In addition, Parker (1997) claims that a typeface "conveys mood, communicates attitude, and sets tone" (p. 60). Similarly, Shushan and Wright (1994) assert that each typeface has a distinct persona. A typeface can be confident, elegant, casual, bold, romantic, friendly, nostalgic, modern, delicate or sassy. Bringhurst (2002) states that "letterforms have character, spirit and personality" (p. 99). "Clearly people differentiate among typefaces and the tones they convey. What remains unclear though is why people perceive typefaces in particular ways and how they determine whether a typeface is appropriate for a particular document" (Mackiewicz, 2003, p. 213). It is a clear consensus that typefaces have distinct personas that convey a message to the reader; however, why people associate these distinct traits with typefaces is unknown.

According to Holst- Larkin (2006), the understanding of the impact of typography, particularly the "subtle influence of what many call the personality of type is still in its infancy." Although it is well accepted that certain typefaces appear more traditional and other sans serif fonts more casual and modern, "there has been little research on the precise effects of the wide range of choices within these categories open

to document designers today" (p. 418). Similarly, according to Brumberger (2003), the earliest research that shows typefaces have personas identified "atmosphere" values for typefaces. This study was conducted by Poffenberger and Franken in 1923. Another study was conducted by Haskins in 1958. Brumberger (2003) states that Haskins investigated the hypothesis that typefaces vary in appropriateness with changes in text subjects. Haskins claimed that the data suggested appropriateness is more of an issue for pieces other than entertainment. In a more recent study conducted in 1986 Walker, Smith and Livingston investigated the hypothesis that the appropriateness of a typeface is in part determined by the extent to which it shares qualities with the ideas that it is being used to represent (Brumberger 2003). The results from each of these studies shows readers are aware of typeface appropriateness for a specific purpose or text. Brumberger (2003) points out that these studies are all older than fifteen years, and typefaces have changed significantly in that amount of time. However, the data collected from the studies is still important for further research today.

A common question in recent research studies is why participants believe that certain typefaces carry different personality traits. According to the results from Mackiewicz and Moeller (2004), "participants suggest that they assess typefaces to have different personalities based on their previous experience with those typefaces as well as anatomical features of the typeface" (p. 311). For example, many participants in recent studies associate Times New Roman with school and professionalism because that is where they have seen or used it the most, due to Microsoft Word's default typeface setting. In older versions of Microsoft Office, 2003 or earlier, Times New Roman is the stock font that is set automatically for use in documents. Also, as mentioned earlier, "type

cannot help but provoke associations. The absence of serifs suggests modernity. Gothic

forms suggest religion or the law" (Wilkinson, 2005, p. 60). Serif fonts tend to come

across as being more strict and boring, while sans serif are more modern and relaxing.

Mackiewicz and Moeller's results also found that participants "intuitively distinguish

among typefaces and the personalities they convey" (p. 311). This means individuals look

at the typeface and the context in which it is used to relate a personality trait to the

typeface. For example, when writing a letter to a friend an appropriate typeface to use

would be a sans serif typeface because, according to research findings, it conveys

friendliness. If it were a letter to a loved one, a person may consider using a script

typeface, since the style conveys a more personal tone conducive to love and warmth.

The majority of people will intuitively match personality traits to the typeface from past

experiences, whether a designer purposefully matches the typeface's personality to the

design or not.

The challenge is no longer finding an affordable type. Instead it is finding a

typeface that represents the document's purpose. With thousands of fonts available to

users as well as designers (most of them free), it can be a hard task finding the most

effective one. Experts tell their audiences to "choose a font that is both comfortable to

read and appropriate in personality, or tone, for the rhetorical situation of the

presentation" (Bringhurst, 2002, p. 95; Mackiewicz, 2007, p. 295; Opsteegn, 2010, p. 15).

A rhetorical situation as defined by Schriver (1997) is "the relationship between the

typeface, the purpose of the document, its genre, the situation and the audience's needs,

desires and purposes" (p. 289). Schriver (1997) also states that "choosing a type based

on the mood one is trying to create is important, and the possibilities are seemingly

endless-from serious to playful, nostalgic to futuristic, delicate to brash, and much more" (p. 266). Kimball & Hawkins also say that typography can play a role in the rhetorical impact of a document. "It gives a tone to whatever the document is conveying. Type should mesh with the client's rhetorical purposes and users' expectations" (p. 167).

"Fonts can influence whether we see an email as professional or casual, or if we even read it" (Bennett, 2008, p. 54). This is because as Mackiewicz (2003) states "Every typeface has a different personality and the ability to convey different feelings and moods. Typefaces can evoke strength, elegance, agitation, silliness, friendliness, scariness, and other moods" (p. 209). Mackiewicz (2003) states, "You must consider the tone typefaces convey. The tone of a typeface imbues it with the power to evoke in the perceiver certain emotional and cognitive responses" (p. 209)

Serif typefaces evoke professional, business, school, book-like and traditional personalities, while sans serif typefaces convey friendliness, neutrality, and casualness. Thus, it is important to choose typefaces and fonts according to their rhetorical purpose, particularly according to what tone or sense of ethos you want to convey to users. Brady (1988) explains that character in type has to do with the "impressions made by the individual forms, their proportions and the intangible something in them that makes the letters of each word hang together to form an agreeable whole" (p. 6). "When choosing a typeface, graphic designers consider the history of typefaces, their current connotations, as well as their formal qualities. The goal is to find an appropriate match between a style for letters and the specific social situation and body of context that define the project at hand" (Lupton, 2010, p. 32)

When Microsoft decided to implement ClearType fonts into Office 2007 as the

default fonts, it was a decision that changed the rhetorical nature of every document

produced using Office. Now, instead of the default body text being Times New Roman, it

is Calibri, a sans serif. The heading default was no longer Arial; it is Cambria, a serif.

Making Calibri the default for Word changed the tone of every document that uses

Calibri. Rather than being seen as a professional or business-like, documents using

Calibri come across as neutral because Calibri is a sans serif typeface.

<div align="center">**Factors that Impact Change of Default Fonts**</div>

Readability

There is a difference between readability and legibility. Readability is the "ease of

reading and understanding the material, while legibility is the ability to discern characters

and words" (Josephson, 2008, p.70). Readability is important because the goal of creating

documents is to have the user understand the text. Tullis, Boynton, and Hersh (1995)

examined the reading rates for Arial, MS Sans Serif, MS Serif, and small fonts in sizes

ranging from 6.0 to 9.75 points. They also found no difference in reading speed between

the serif and sans serif fonts. Bernard, Lida, Riley, Hackler, and Janzen (2002) compared

four sans serif fonts—Arial, Comic, Tahoma, and Verdana—and four serif fonts—

Courier New, Georgia, Century School Book, and Times New Roman—at 10-, 12-, and

14-point sizes. They also found no significant differences in reading efficiency. However,

they noticed that Times New Roman and Arial, the two typefaces that were most

commonly used in print were the ones read fastest onscreen because of reader familiarity.

Holst-Larkin (2006) states that "researchers now agree that readability is by no

means the most important design issue because most typefaces have been redesigned to

maximize legibility" (p. 418). However, there are many things that work together to achieve excellent readability. Line length, kerning, leading, and font size are just some of the factors. "Readability is the relative ease in which you can read a printed page due to type arrangement, page design and space between the elements" (Brady, 1988, p. 6). Readability refers to the type's ability to attract and hold the reader's attention. Readability is what makes us take notice of text and want to read more (Opsteegh, 2010, p. 14). Likewise, Mackiewicz (2007) explains that "readability is a functional property of type because it affects the extent to which a text can carry out its purpose." (p. 296). Opsteegh (2010) states that "typography actually has dramatic effects on readability" (p. 13). The type used should always be appealing and inviting to the reader. Bad typography can obscure the meaning or tone of the message.

We are using the web more than ever before to read information as well as using word-processing programs to create documents. These factors have increased the volume of material that we read from the screen. As readers in the twenty-first century, we find ourselves reading an increasing amount of electronic text including emails, webpages, text messages, and ebooks. Studies conducted have found that using a sans serif font for onscreen viewing, whether it is a website, a PDF, an email or a Word document will be easier on the eyes to read. "Text rendered onscreen has much lower resolution than printed type" (Weisenmiller, 1999, p. 27). "The low resolution of computer screens is especially problematic for fonts with serifs" (Josephson, 2008, p. 68). Matthew Carter, the designer of Verdana explains, "pre-existing printer fonts are spaced for paper, not the screen, so they suffer on-screen" (Will-Harris, 1998). Will-Harris (1998) notes that size of typeface is a key variable in readability and suggests that 14-16 point type is

significantly easier to read than smaller type, cautioning against any point size set at 10 point or smaller. To help with the onscreen readability problem, there have been typefaces designed specifically for onscreen reading. These typefaces are Verdana and Garamond.

Legibility

Legibility is also a very important aspect of type. The concept of legibility is not new: "legibility was first studied in the late 1800s by Parisian Jean Anisson and has been a concern for many typographers and graphic designers for more than one hundred years" (Schriver, 1997, p. 251). Although the definition is similar to readability, legibility focuses more on the ability to recognize words and letters. Experts differentiate between font readability and font legibility. Font legibility is the ease with which readers can identify letterforms (Mackiewicz, 2007, p. 296). Kimball & Hawkins (2008) explain that "legibility refers to the extent to which readers can make out the individual letters of a typeface easily and efficiently (p. 166). Additionally, Brady (1988) defines legibility as being "related to the speed with which each letter or letter combination can be recognized" (p. 6). Likewise, Schriver (1997) states that "legibility concerns the features of typography that make it easy for people to read text – whether in short bursts as on road signs, or billboards or over extended periods as in the continuous text of a novel" (p. 251). Most text in novels is a simple, common serif font and text used on road signs is a simple sans serif font. Added embellishments make fonts complicated and harder to read. Goudy (1940) explains that "to define legibility is to interpret an expression, an essential quality, a subtle attribute of type letters that makes some types more easily readable than others used in a similar manner" (p. 123). Legibility depends on three things: simplicity,

contrast and proportion. Simplicity in legibility refers to the simple design of the type. Simple typefaces will have no serifs, or if they have them, they will be simple. The goal with simplicity is to make the letters transparent to the reader. Contrast refers to the color of the text in relation to the color of the screen background or paper, if the document is printed. Proportion is referring to the typeface's size. If the type is too large, it becomes obnoxious, but if the type is too small it is difficult to read (Haley, 2010).

Several studies of legibility have shown that people read serif-style faces with greater ease than sans serif-styles. Research results suggest that the finishing stokes of serif typefaces have been said to help the eye to distinguish individual characters and to recognize words. Serifs are also believed to improve tracking in horizontal lines of text, enabling rapid movement from one line to another. "Although early research suggested advantages for serif type in continuous text, more recent investigations have found no clear pattern suggesting that serif is always superior to sans serif" (Schriver, 1997, p. 276). Research also suggests that readers often experience problems with the legibility of type on a computer screen. While some typefaces presented on a computer or television may have an ugly, jagged look, others have a tight, cramped appearance. Either way, poor legibility slows readers in their attempts to interpret the text. In fact, studies of writers and editors working online have "found that reading online may take people 20 to 40 percent longer than reading on paper. Writers and editors are also more likely to experience fatigue and eye strain when proofreading lengthy documents online than when editing lengthy documents on paper" (Schriver, 1997, p. 282). Today, the major challenge is to choose the most appropriate type from a wide range of legible choices. Appropriateness is best achieved when purpose and context fit with the mood of a

typeface. With more type choices available, it is up to users to make a good choice when picking a type for a project.

Impact of the Web

At the end of 1994, when the web was just starting to make the headlines, there were only 10,000 web servers around the world. By the end of 1999, the number was approaching 10,000,000 and rising fast (Gillies & Cailliau, 2000, p. 91). This initial start of the web is now commonly referred to as "Web 1.0." This term encompasses the first stage of the web, which links webpages with hyperlinks. Web 1.0 was used until 2001. After 2001, "Web 2.0" was used to describe the web development dealing with social media, including podcasting, blogging, social networking and web content voting. Currently the web is in version 3.0, which is known as the "Semantic Web." The main difference between Web 2.0 and 3.0 is the coding. Web 3.0 incorporates XML, Extensible Markup Language, a language that defines a set of rules for encoding documents on the web. The technology and advancement of the web is important in developing typefaces because with newer improved web technology, more "web safe fonts" can be produced. Web safe fonts are fonts that are either designed specifically for use on the web or have been designed as a TrueType/OpenType font that has the correct HTML/CSS technology to be viewed on a website. If a font is used on a website that a visitor doesn't have installed on his/her computer, the web browser will attempt to select a similar alternative. Common web-safe fonts are Arial, Helvetica, and Times New Roman, as well as Georgia and Verdana, which were designed specifically for the web.

Microsoft decided to change the default fonts in Office 2007 from Times New Roman to Calibri. This change resulted in a sans serif font becoming the main body type,

which is the opposite of what it should be, a serif font. This major change prompted my research on the impact the change has on users and if they make informed choices of fonts. I was also interested in what advertising samples in a community communicate about the frequency, use and usability of fonts.

Methodology

To better understand how the change of default fonts affected users, I performed two different analyses. One was a student survey measuring student knowledge and use of default fonts when composing documents. The other was an analysis of typefaces used in documents found around campus.

Printed Survey

The focus of the survey was to investigate if students are aware of typefaces and their appropriate uses when composing documents. Four English 201 classes at Eastern Washington University in Cheney, Washington participated in the survey. Ninety undergraduate English 201 students responded to the survey questions. Eastern Washington University (EWU) is located in the Inland Northwest. For the fall of 2012, EWU admitted 12,587 students; 44% of the student population at EWU is male and 56% is female (Eastern Washington University, 2013). The English 201 course, even though it is a convenient sample, still represents the student population at Eastern because every university student except transfer students are required to take it. The course satisfies the university's writing proficiency requirement. Students enrolled in the course are required to compose several essays and a literature review. Students register for the course online and select the section that best meet their schedule. Because the course is a university

requirement and students self-select sections, the student responses offer a convenient sample that promises to be representative of the overall student population.

For the survey study, participants were given a self-administered, printed, five-question survey that was generated from the online survey tool surveymonkey.com. Participants were also provided with written instructions at the beginning of the survey informing them of their option to participate or not, as well as their rights as a participant in the study. It also provided contact information if they had further questions. The survey was structured so the participants were able to answer it in less than five minutes. Thus, the survey was composed of three five-point Likert Scale questions, one fill-in-the-blank and one multiple choice, with five options.

Survey questions (Appendix A) sought to determine the participant's knowledge of fonts and whether students made informed font choices when composing documents. Question 1 looks at the importance of fonts to the student. Question 2 investigates how frequently the student uses default fonts. Question 3 focuses on the possibility that the student will change the font when composing a document. Question 4 explores the student choice in font if student changes the default font. Question 5 examines which word processing program the student uses when composing documents. The goal of the survey was to investigate the way students use fonts and if their font choices are informed.

Quantitative Content Analysis of Advertisements

Boettger and Palmer (2010) explain that a content analysis assesses words, phrases, or in-text relationships. "Quantitative content analysis can prove to be a more powerful method than surveys and interviews because of its unobtrusive nature and its

lack of reliance on subjective perceptions" (Boettger and Palmer, 2010, p. 346). They define content analysis as a "research technique for making replicable and valid inferences from texts and other meaningful matter in the contexts to their use" (Boettger and Palmer, 2010, p. 346). Texts can be broadly classified to include printed matter, images, maps, art, sounds, signs, or symbols.

Over the course of two weeks, I collected random flyers, posters, newsletters and brochures from bulletin boards around the Eastern Washington University campus. These samples advertised events that are happening on campus or in the community.

When performing the content analysis, I investigated three questions. These questions sought to determine if the font used in the samples was effective for the event advertised and the target audience. To examine the effectiveness of the fonts used in the samples, I needed to investigate who the sample was written for, why it was made and how the sample is being used.

To properly assess the collected samples for effective design, a quantitative coding system was developed (Appendix B). The following six content areas formed a basic categorization method: number of fonts used, purpose of document (poster/schedule of events, brochure, newsletter and flyer), effective use of fonts, readability, legibility and typeface persona. Coding required a review of each sample. From this information, samples were coded under the appropriate rubric.

Results

Upon conclusion of the student survey and content analysis, I reviewed and tallied the results. The results from both are recorded separately, below.

Survey

When asked how important the type was when composing a document, 12 (13.3%) participants responded with not very important, 23 (25.6%) responded in-between not very important and important, 25 (27.8%) responded with important, 15 (16.7%) responded in-between important and very important and 15 (16.7%) responded with very important. Figure 1 shows these results.
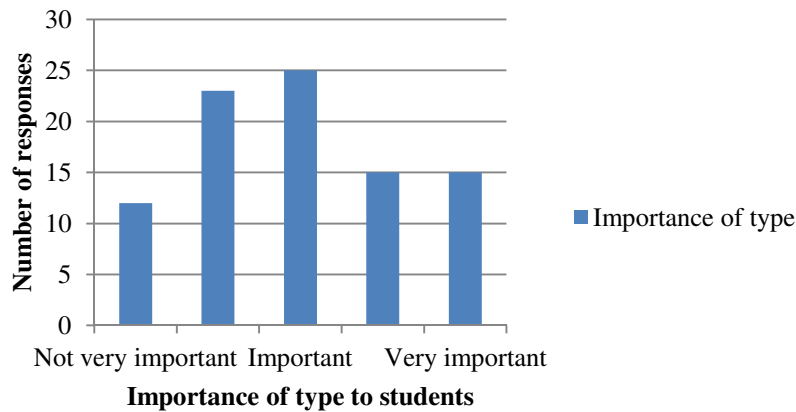

Figure 1. Importance of type.

When asked how often the participants used the default fonts, 9 (10.0%) responded with never, 11 (12.2%) responded in-between never and sometimes, 24 (26.7%) responded with sometimes, 29 (32.2%) responded in-between sometimes and always and 17 (18.9%) responded with always. Figure 2 displays these results.
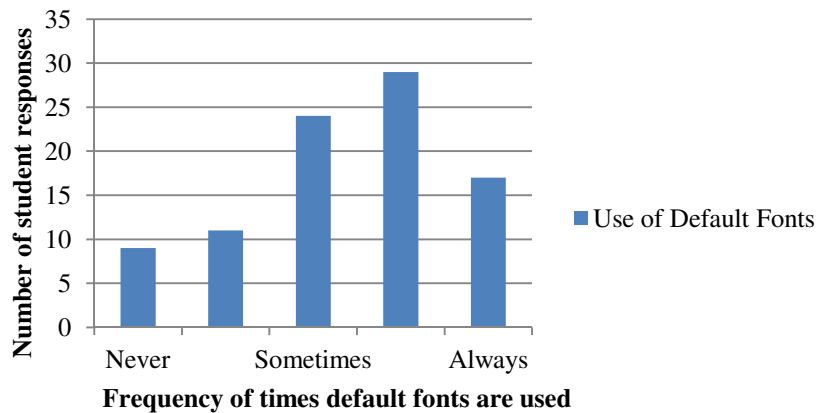
Figure 2. Frequency default fonts are used

When asked how likely participants were to change the font when writing a paper, 24 (27.0%) responded with not likely, 17 (19.1%) responded in-between not likely and likely, 22, (24.7%) responded with likely, 13 (14.6%) responded in-between likely and very likely and 13, (14.6%) responded with very likely. One participant skipped this question. Figure 3 represents this data.
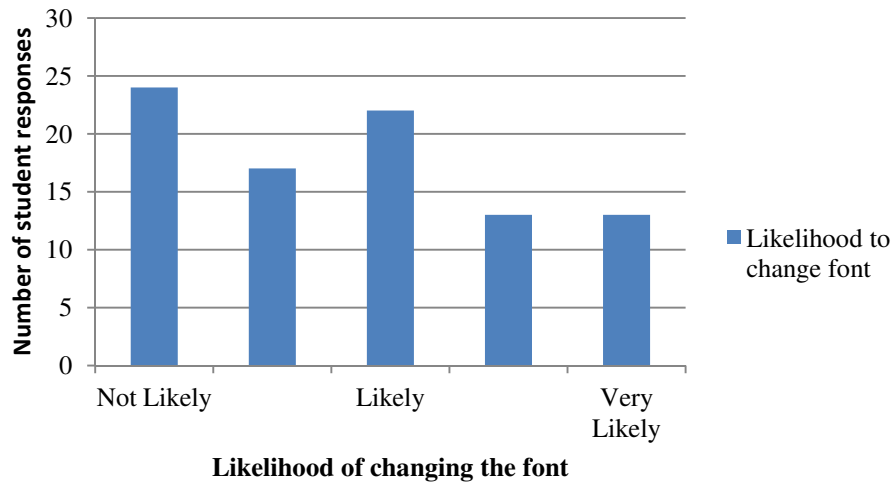

Figure 3. Student's likelihood to change font.

When asked what font participants' change to when composing a document, 66 responded with Times New Roman, 7 said Calibri, 2 responded with Cambria, 2 said Arial, 1 responded with Georgia, 1 with Tahoma, 1 with Comic Sans, 1 with Bookman, 4 responded with it depends on the document and its purpose and 5 participants skipped this question. Figure 4 illustrates these results.
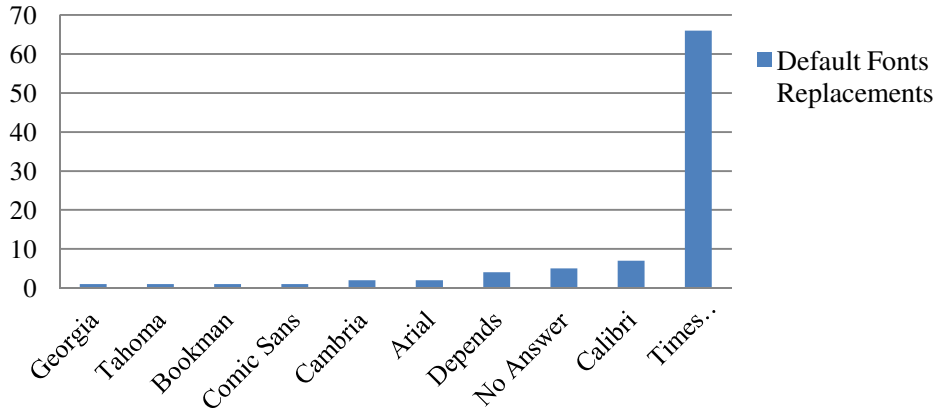
Figure 4. Replacement fonts for default fonts.

When asked which word processing program participants use when composing a document, 3 (3.3%) responded with Apple Pages, 82 (91.1%) responded with Microsoft Word, 3 (3.3%) responded with Open Office, 0 responded with InDesign and 2 (2.2%) responded with other. Other was recorded as Google Docs. Figure 5 shows these results.
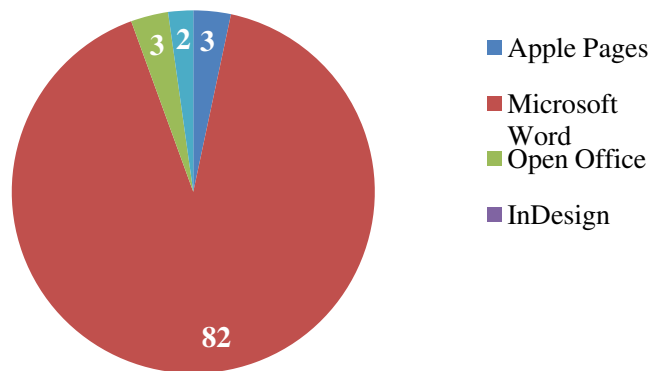

Figure 5. Preferred word processing program.

Content Analysis

Type of samples collected were categorized as follows: 3 (12%) were Posters/Schedule of Events, 1 (4%) was a brochure, 2 (8%) were a newsletter and 19 (76%) were flyers. Figure 6 displays these numbers.
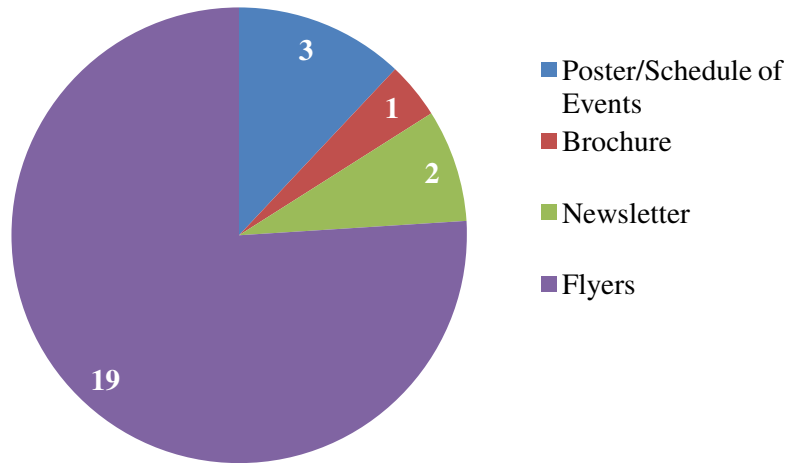
Figure 6. Type of samples analyzed.

All of the collected samples intended audiences were 12 (48%) students, 0 faculty and community, 6 (24%) students and faculty, and 7 (28%) everyone, as demonstrated in Figure 7.
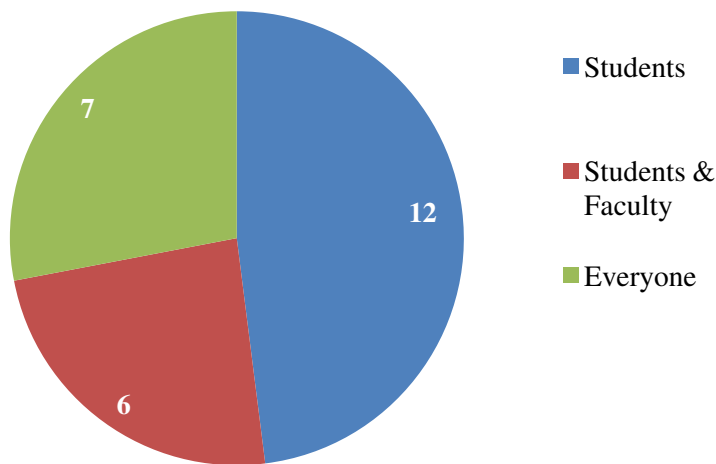

Figure 7. Intended audience for all collected samples.

An analysis of the total number of typefaces used resulted in 7 (28%) using one typeface, 5 (20%) using two typefaces, 8 (32%) using three typefaces, and 5 (20%) using four or more typefaces, as shown in Figure 8.
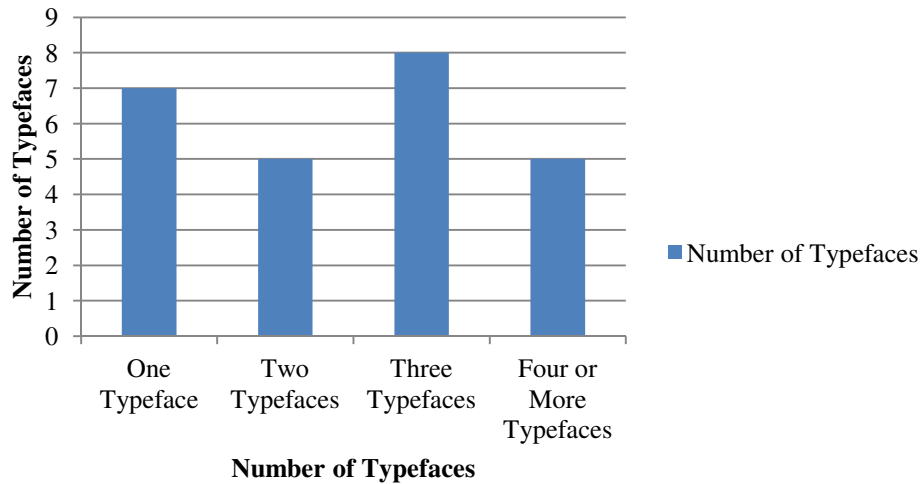
Figure 8. Number of Typefaces

An analysis of effective use of typeface showed that 2 (8%) demonstrated a lack of knowledge, 13 (52%) demonstrated awareness of proper font use, 7 (28%) demonstrated knowledge of proper font use, and 3 (12%) demonstrated complete understanding of proper font use. Figure 9 displays this data.

Figure 9. Effective use of fonts.

An analysis of whether or not serif and sans serif fonts were used appropriately showed that 8 (32%) demonstrated lack of understanding of the purpose of serif and sans serif fonts, 2 (8%) demonstrated awareness of serif and sans serif fonts, 11 (44%)

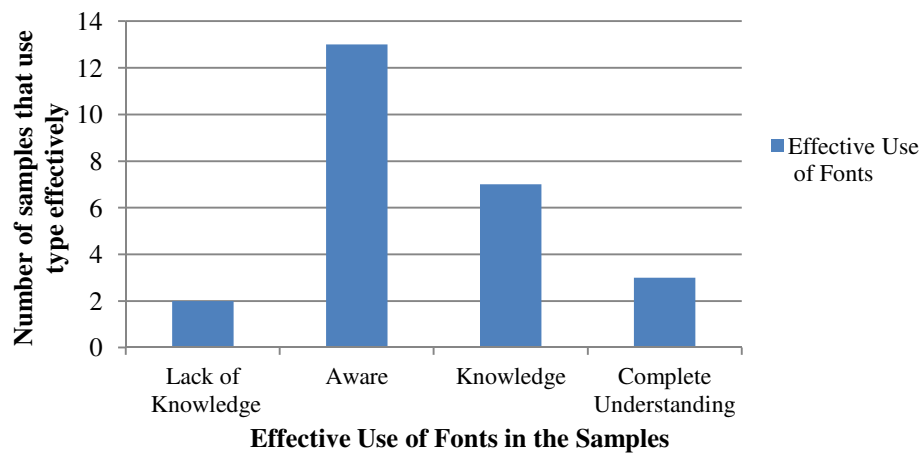demonstrated knowledge of the purpose of serif and sans serif fonts, and 4 (16%)

demonstrated complete understanding. Figure 10 illustrates these findings.
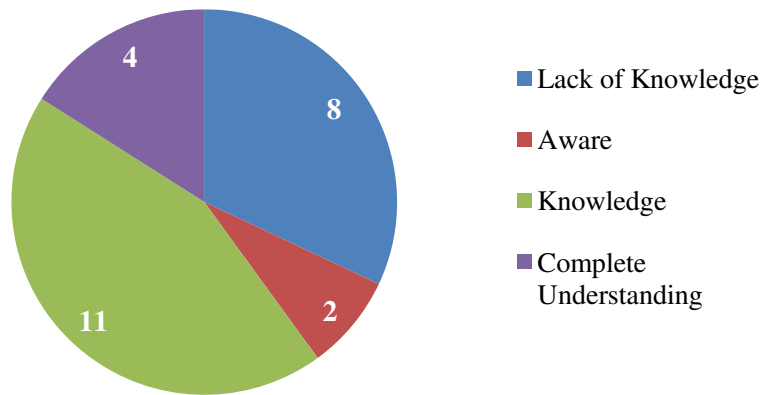
Figure 10. Proper use of serif and sans serif fonts.

For the sample's overall readability, 0 demonstrated a lack of understanding, 2

(8%) demonstrated awareness, 9 (36%) demonstrated knowledge and 14 (56%)

demonstrated complete understanding. Figure 11 shows these results.
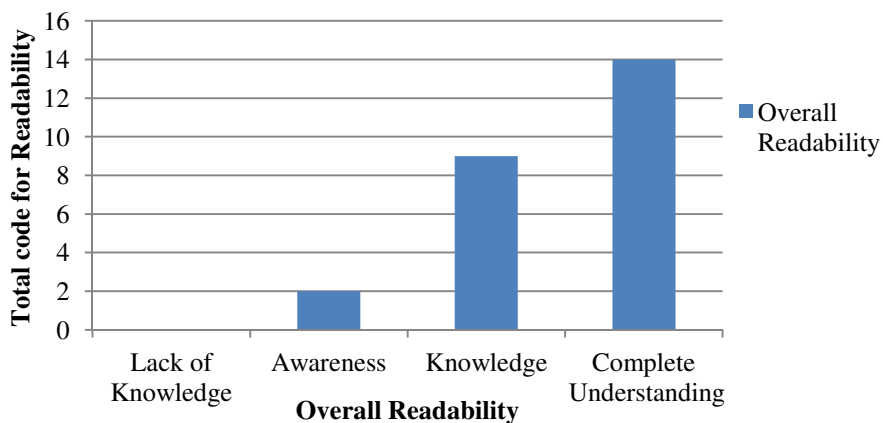
Figure 11. Effective readability.

For the sample's overall legibility, 0 demonstrated a lack of understanding, 3

(12%) demonstrated an awareness, 8 (32%) demonstrated knowledge and 14 (56%)

demonstrated complete understanding. Figure 12 displays these results.
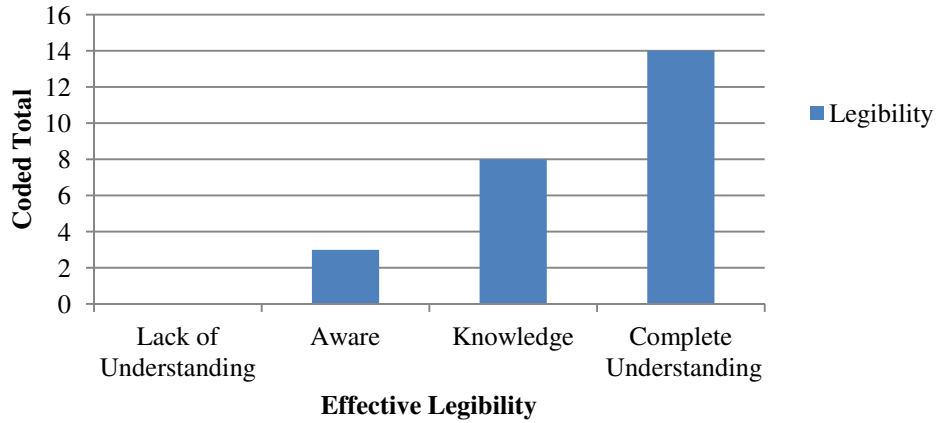
Figure 12. Effective legibility.

An analysis of whether or not the typefaces used matched the document's purpose and intended audience found that 0 demonstrated lack of typeface persona, 1 (4%) demonstrated awareness of typeface persona, 9 (36%) demonstrated knowledge of typeface persona, and 15 (60%) demonstrated complete understanding of typeface persona. Figure 13 illustrates these results.

Figure 13. Awareness of typeface persona.

After all the samples were coded, the totals were added up and the samples were placed in categories based on their coded totals. The results of the coding are 0 samples that were coded ranked between 6 and 12 points. 4 samples fell between 12 and 16

points. 15 samples had coded totals between 16 and 20. And 6 samples totaled between

20 and 24. Figure 14 displays this information.
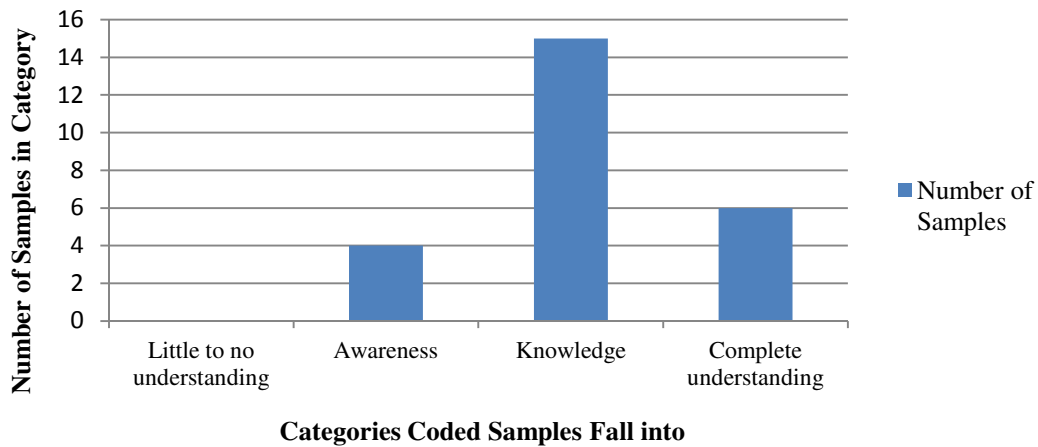
Figure 14. Categories of coded samples.

Table 1
Analysis of event advertisements found on a college campus.

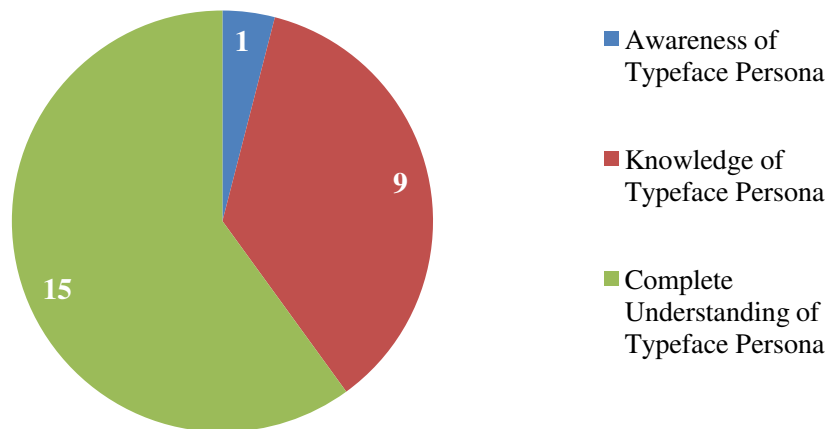| Sample #	Type of sample	Intended Audience	Total # of typefaces used	Type used effectively	Serif/Sans serif fonts used appropriately	Readability	Legibility	Typeface Persona	Total
1	B	D	1	1	3	3	2	3	**13**
2	D	E	3	3	2	4	4	4	**20**
3	A	A	4	2	1	3	2	3	**15**
4	C	D	1	2	3	3	4	4	**17**
5	D	A	4	4	4	4	4	4	**24**
6	D	A	2	2	3	4	3	3	**17**
7	A	E	1	4	4	2	2	2	**15**
8	D	A	3	3	1	4	3	4	**18**
9	D	D	4	3	1	3	3	4	**18**
10	A	E	4	2	1	3	3	3	**16**
11	D	D	1	2	3	4	4	4	**18**
12	D	E	2	2	3	4	4	4	**19**
13	D	A	2	4	4	4	3	3	**20**
14	D	A	3	2	3	3	3	3	**17**
15	D	A	2	2	4	4	4	4	**20**
16	D	A	2	2	3	4	4	3	**18**
17	D	D	3	1	1	3	4	4	**16**
18	C	D	2	2	3	3	4	4	**18**
19	D	A	3	3	1	2	3	4	**16**
20	D	E	3	3	2	4	4	4	**20**
21	D	A	4	3	3	4	4	4	**22**
22	D	A	2	2	3	4	4	4	**19**

23	D	A	1	2	3	3	3	3	**15**
24	D	E	2	2	1	4	4	4	**17**
25	D	E	3	3	1	4	4	3	**18**

Discussion

The purpose of this study was to investigate the history and use of default fonts. The issues my research explored included readability (both onscreen and in print), legibility of fonts, impact of the web, and user awareness. More specifically, my goal was to examine user's knowledge of fonts and to determine if they make choices based on that knowledge or simply use the default option.

In this study, ninety university students participated in a five question survey that measured their knowledge and use of fonts. The five questions sought to determine if type was important to students. The responses confirm that students use the new default, Calibri, almost all of the time. The survey study also shows that most students continue to use Times New Roman when composing documents, with 66 students responding they change the default font in Microsoft Word to Times New Roman when they compose documents.

While students think that font is important, they continue to use the default fonts because they are unsure of how to change the font; they don't have particular knowledge about serif and sans serif fonts and the specific uses of typefaces; they are unsure if their instructor allows changing the font, and they don't feel it is necessary to change the font of the document. The most common reason as to why students continue using the default fonts is because they are unsure of how to change them. This could be because they have never had to change the font before or because they are completely new to the word

processing program they are using. Also, not having enough knowledge about fonts and their purpose, specifically how serif and sans serif typefaces are used rhetorically, is another reason why students may still use the default fonts. The average student may not have enough understanding of type to know that serif fonts are an excellent choice for the body text of printed documents while sans serif fonts are great for headings and onscreen documents. Final reasons students consider fonts to be important but continue using the default fonts are because they don't feel it necessary to change the font of their document and do not know if they are allowed to. Sometimes changing the font is a time-consuming process, and if there is no reason to, students will avoid doing so.

It is apparent that students are not likely to change the default font in their documents, but if they do, they change the font to Times New Roman. However, Times New Roman is no longer a default font in Microsoft Word and never was a default in Apple Pages. The only program in which Times New Roman is a default font is in OpenOffice, which only three students reported using. However, the font students selected after Times New Roman is Calibri, which is a default font in Microsoft Word 2007 and newer. The majority of students are also using a PC instead of a Macintosh. With these responses, it is easy to assume that students are using Microsoft Word 2003 or OpenOffice, where the default font is Times New Roman. Familiarity in font choice could be a deciding factor as to why students continue to use Times New Roman. This is because at one time, Times New Roman was used for everything that was produced in Microsoft Word. Students feel comfortable with using a font that has been around for a long time, rather than a font that has just appeared out of nowhere and reset the defaults.

The survey study suggests that Microsoft Word users are not affected by the change of default font. This is because the majority of student responses said they use the default font in Microsoft Word. However, the survey did not specify which version of Microsoft Word students used. Future studies would look at what version of Microsoft Word is most commonly used among students. The version of Microsoft Word the student used is important because in Office 2007 for Windows and Office 2008 for Mac, the default fonts changed. Instead of having Times New Roman, a serif typeface that previous research (Brumberger, 2003) has found to be appropriate for business documents, the default font was switched to a recently new font, Calibri, a sans serif that makes good use of Microsoft's new ClearType technology. According to Mackiewicz (2007), using a sans serif font for the main body text is perceived to make the document more casual.

The second part of my study included collecting 25 event advertisements and conducting a quantitative coding analysis to see if the designers made informed type choices when creating the ads. The coding analysis resulted in a third of the samples using three typefaces, which is one more than what typography experts suggest (Bringhurst, 2002; Kimball & Hawkins, 2008; & Schriver, 1997). Based on the rule of using two typefaces for each document, the designers made informed choices when deciding which fonts to use. The samples that used two fonts in their advertisement were less distracting to the eye in addition to effectively displaying the event information.

When designing advertisements, half of the sample creators demonstrated awareness of proper font use. This shows that the document designers know how important the use of type in an advertisement can be. Also, more than half of the

designers correctly used serif and sans serif fonts, meaning that headings were in a sans serif while body text was in a serif font. This demonstrates that while they may not be expert designers, the creators of the advertisements are aware of how serif and sans serif fonts were designed to interact properly with one another in a document.

The results of the sample analysis demonstrate that designers understood readability factors, including line length, kerning and appropriate font size. In addition, the majority of samples demonstrated that the designers had understanding of legibility factors including simplicity, contrast and proportion. These results indicate that the advertisement designers are conscious of the font choice when pairing the type with an image, background, colored paper and colored text. The designers are aware of good design principles and their effect on the audience.

Similarly, the content analysis results showed the majority of advertisements demonstrated complete understanding of typeface persona, which means that the type used in the event advertisement matched the overall audience and tone of the event. This confirms that designers are aware of typeface persona and use the persona of a typeface to its advantage when designing advertisements for events. The designers have an understanding that matching type with an event will better the overall design and possibly attract more viewers to the advertisement.

The totals of the coded samples demonstrate that more than half of the sample designers have knowledge of using type and designing with type effectively. These results prove that even though an individual who is not an expert in the field of typography designed most of the advertisements, the designer knew the basics, which is enough to create a functional document that does not have distracting elements in it.

The results of my research demonstrate that the majority of users are aware of typeface and its effects when composing documents and event advertisements. The content analysis results indicate that most designers are aware of the effect that typefaces have on the overall purpose of the document.

Conclusions

Fonts are important in the creation of documents and event advertisements. Examining how students think about and use fonts is useful in identifying how changing the default fonts impacts them. Additionally, analyzing event advertisements for knowledge about effectively using fonts, readability, legibility and matching typeface persona to the advertisement's audience is imperative to understanding how the creators use fonts, or believe fonts should be used.

While similar studies about the appropriateness of typefaces (Brumberger, 2003) and the perceived personalities of typefaces (Mackiewicz, 2007) have been conducted previously, no research has investigated the impact changing the default fonts has on users. My research explored the factors that influenced Microsoft to change the default fonts in their Office 2007 suite, the history and uses of previous and current default fonts and why proper type design in important. To find out if the default font switch affected students, I conducted a short student survey that sought to determine how users interact with fonts while composing documents and completed a content analysis that determined how event advertisements use type.

I found that when students compose documents, they find type to be important, are not very likely to change the default font to another font, and will most likely use the default font. If they happen to change the default font, they change the font to Times New

Roman. The content analysis of the advertisement samples establishes the fact that while not all advertisements are created by expert designers, novice designers have a good understanding of the importance of type in relation to the intended purpose of the document. It also proves that good design is not just text layout; it is also legibility of the type as well as the readability of the font used.

This research is important because it shows how changing a default font in a popular software program can affect as well as influence students' font choices when composing a document. This research also shows that while not everyone is as versed in the elements of typography and document design, individuals have a sense of what good design is and tend to use it when designing event advertisements for display around campus. Microsoft may have changed the default font in Word to Calibri in 2007, but many users are still connected to and feel comfortable with Times New Roman.

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Appendix A

1. When composing a document, how important is the type (font) to you?

Not very important		Important		Very important
○	○	○	○	○

2. How often do you use the default fonts?

Never		Sometimes		Always
○	○	○	○	○

3. When writing a paper, how likely are you to change the font?

Not likely		Likely		Very likely
○	○	○	○	○

4. If you change the font in your document, which font do you regularly choose?

☐

5. Which program do you use when composing a document?

☐ Apple Pages

☐ Microsoft Word

☐ Open Office

☐ InDesign

☐ Other:

Codebook.

Ad Identification Number: Number assigned to each sample by the researcher, as indicated on the sample.

Type of Ad:

Poster/Schedule of Events – Larger than 8.5 x 11 inches and includes several dates, locations, times, and descriptions for different events. Typically has a dominating image.

Brochure – 3 fold document that provides information about a single topic.

Newsletter – Daily, weekly, monthly, or quarterly publication with multiple sections of information.

Flyer – A general advertisement. May contain images, dates, times, locations and general information about the event it is advertising.

Number of Typefaces Used – The total number of different typefaces used in the advertisement. A typeface is defined as "the complete set of characters, punctuation and symbols that share a common design" (Schriver, 1997, p. 254; Van Horn, 2004, p. 727; Wilkinson, 2005, p. 57; Kimball & Hawkins, 2008, p. 152; Harrell, 1991, p. 72). In addition, typefaces usually include four fonts: normal, italic, bold and bold italic (Harrell, 1991, p. 72).

Effective use of Fonts – Using fonts effectively means there are no more than two different fonts in the sample. Also, the sample contains only one serif font and one sans serif font. A serif font is described as those fonts that have "feet," which allow for easy continuation when reading. A sans serif font is a font without feet, and usually considered

to look more modern. Serif fonts for body and sans serif for headings. The sample limits the number of fonts used.

Readability – "Readability is the relative ease in which you can read a printed page due to type arrangement, page design and space between the elements" (Brady, 1988, p. 6). "Readability is a functional property of type because it affects the extent to which a text can carry out its purpose" (Mackiewicz, 2007, p. 296). Line length, kerning, leading and font size are factors that work together to achieve excellent readability.

Line length – is the "distance between the left and right margin of the type" (Schriver, 1997, p. 262).

Kerning – is the "adjustment of the space between two letters" (Lupton, 2010, p. 102).

Leading – is the "amount of vertical space between lines of type" (Schriver, 1997, p. 260).

Font size – The size of the font. "Too small a font can be difficult to see, but using too large a font can make it hard for the eye to take in enough of the shape to discern meaning" (Kimball & Hawkins, 2008, p. 167).

Legibility – Legibility concerns the features of typography that make it easy for people to read text. "To define legibility is to interpret an expression, an essential quality, a subtle attribute of type letters that makes some types more easily readable than others used in a similar manner" (Goudy, 1940, p. 123). Legibility depends on three things: simplicity, contrast and proportion.

Simplicity - Simplicity in legibility refers to the simple design of the type. Simple typefaces will have no serifs or if they have them, they will be simple. The goal with simplicity is to make the letters transparent to the reader (Haley, 2010).

Contrast- Contrast refers to the color of the text in relation to the background image or color of the paper used for printing (Haley, 2010).

Proportion- Proportion is referring to the typefaces size. If the type is too large, it becomes obnoxious, but if the type is too small is difficult to read (Haley, 2010).

Typeface Persona – Effectively linking to audience. For advertisements targeted to students for entertainment purposes these personas should be considered: fun, casual, and modern. Does the typeface used mesh well with the intended audience and convey the same feelings as the event it is advertising?

Coding Form
1. Sample Number: _____
2. Type of Sample:
   a. Poster/Schedule of Events – Larger than 8.5 x 11 inches and includes several dates, locations, times and descriptions for different events. Typically has a dominating image.
   b. Brochure – 3-fold document that provides information about a single topic.
   c. Newsletter – Daily, weekly, monthly, or quarterly publications with multiple sections of information.
   d. Flyer – A general advertisement. May contain images, dates, times, locations and general information about the event it is advertising.
3. Sample's Intended Audience
   a. Students
   b. Faculty
   c. Community
   d. Students & Faculty
   e. Everyone
4. Total number of typefaces used
   1. Four or more
   2. Three
   3. One
   4. Two
5. Type is used effectively
   1. Demonstrates lack of knowledge of proper font use. More than three fonts used, more than one serif and sans serif font and serif and sans serif fonts are used for both headings and body text.
   2. Demonstrates awareness of proper font use. There are more than two fonts used, more than one serif and sans serif font and are used for both headings and body text.

3. Demonstrates knowledge of proper font use. There are one- two fonts used, contains either one serif or sans serif font, and the serif fonts are used as heading text while the sans serif are used for the body text.
4. Demonstrates complete understanding of proper font use. There is no more than two fonts, contains only one serif font and one sans serif font, Serif fonts are used for the body and sans serif fonts are for headings.

6. Serif and sans serif fonts used appropriately
   1. Demonstrates lack of understanding of purpose of serif and sans serif fonts. Sample uses only sans serif fonts.
   2. Demonstrates awareness of purpose of fonts. Sample uses only serif fonts.
   3. Demonstrates knowledge of the purpose of fonts. Sample uses both serif and sans serif fonts, and serif fonts are used as headings while sans serif fonts are used as body text.
   4. Demonstrates complete understanding of proper use of fonts. Serif fonts are used for body text while sans serif fonts are used for headings.

7. Sample's overall readability
   1. Demonstrates lack of readability in that line length is too long, font size is too large/too small and there is not enough kerning or leading. Type is not arranged in a manner that is easy to read.
   2. Demonstrates awareness of readability. Font size is decent, line length is a little long, kerning and leading could be adjusted a little more. Somewhat easy to read.
   3. Demonstrates knowledge of readability. While the sample is easy to read and the font size is almost perfect, kerning, leading and line length may still be a problem.
   4. Demonstrates perfect understanding of readability. Font size isn't too big or too small, line length, kerning and leading are all perfect. Type is arranged in such a way that makes the sample very easy to read.

8. Sample's overall legibility
   1. Demonstrates no understanding of legibility. Fonts used are very decorative and distracting making them hard to read, the text is too dark/too light in relation to the background image/paper printed on, and type is too big or too small.
   2. Demonstrates awareness of legibility. Text size may be too large/ too small, font color needs to be darker or lighter or the paper color needs to be different and only one font, if any, is distracting.
   3. Demonstrates knowledge of legibility. Font size is almost perfect, type used is almost transparent and non-distracting, and contrast in the sample is great.
   4. Demonstrates complete understanding of legibility. Font size proportion is perfect, the contrast of font color with background images and paper color is flawless and the simplicity of the text decorations (if any) do not distract from reading.

9. Typeface used matches sample's purpose and intended audience
   1. Demonstrates no understanding of proper typeface persona. Typefaces used do not match document's purpose

2. Demonstrates awareness of typeface persona. Typefaces used may not match the sample's purpose, but they are almost a perfect match.
3. Demonstrates knowledge of typeface persona. At least one typeface is a match with the sample's overall purpose.
4. Demonstrates complete understanding of typeface persona. All typefaces used match the sample's purpose.

6 – 12 Little to no knowledge
12 – 16 Awareness
16 – 20 Knowledge
20 – 24 Complete understanding

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