Channels: Where Disciplines Meet

Volume 2
Number 1 *Fall 2017*

Article 1

December 2017

Color Theory in Technical Communication

Kelly J. Conley
Cedarville University, cocoablack13@gmail.com

Recommended Citation

Conley, Kelly J. (2017) "Color Theory in Technical Communication," *Channels: Where Disciplines Meet*: Vol. 2 : No. 1 , Article 1.
DOI: 10.15385/jch.2017.2.1.1
Available at: https://digitalcommons.cedarville.edu/channels/vol2/iss1/1

Color Theory in Technical Communication

Abstract

Technical communicators tend to overlook or avoid using color in their work. However, color theory is a powerful tool that can greatly affect how information is presented in print or on the web. By using color, technical communicators can help users respond to information in a positive manner and increase reading comprehension, usability, and organization. This paper will provide a framework and examination of the theoretical side of color theory as well as applications for using color in the workplace.

Keywords

color, color theory, color theory communication, color technical communication, color theory technical communication, color application in technical communication, emotions colors, color global meanings, colors emotions, color theory in the workplace, definition of color, universalist color theory, relativist color theory

Color Theory in Technical Communication

Kelly Conley
Communication — Cedarville University

Introduction

Color theory is often overlooked in technical communication. Most professionals may be more concerned with writing, editing, revising, and designing their documents than how color fits into their work. Despite its obscure role in technical communication, color theory can play a crucial yet subtle role in how effective a document is to readers. In this paper, I will discuss several features of color theory such as definitions, properties, color terms, its effect on people's perceptions, and applications in the workplace. By discussing color theory, I hope to show why technical communicators should utilize color and how they can implement this powerful tool in their work.

Color theory has a rather short history, starting in 1969 and growing in interest and relevance in the ensuing years. I have used peer-reviewed sources from the 1960s to the present day. This paper covers the theoretical and real-world aspects of color in technical communication.

Literature Review

Definitions of Color Theory

Before examining the multiple aspects of color theory, one must first understand the many definitions that color has been given over the years. From scientific definitions (Mackiewicz 2009; Agoston 1987) to subjective, perceptual definitions (Grieve 1991; Puhalla 2008), color can be difficult to define. Agoston (1987) admitted in his book, *Color Theory and Its Application in Art and Design*, that the term *color* has various and specialized meanings in ordinary speech and the scientific domains of chemistry and psychology (p. 5).

From a scientific standpoint, Mackiewicz (2009) defined color as wavelengths of light that are reflected off of objects. Agoston (1987) added that colors could be viewed as a property of materials and light. He went on to quote psychologist L.M. Hurvich, who said color can be a neural event in the retina of an eyeball (p. 9). On the other end of the debate, others have claimed the opposite. Puhalla (2008) defined color as "an intrinsic visual attribute of form" (p. 199), saying that "color has immediate perceptual and cognitive significance in human

experience" (p. 199). He also adds that theorists from Galileo's time believed color was "a subjective mental construct of physical objects or physical objects that produce visual states of color" (p. 200). Grieve (1991) agreed with the subjective nature of color: "Colour vision as one form of sensory perception can be seen merely as a neural event; however, the individual's reaction to the color percept is a subjective process" (p. 1319). He later added that color is basically an experience that affects many areas in life (p. 1319).

Color's Three Properties

Color has three properties that help explain the wide assortment of existing colors: hue, value (also known as brightness), and saturation (also called chroma). Each property plays a role in determining the differences among colors. They can combine and interact with each other.

Hue

It can be difficult to technically define "hue," but it has been defined as the concept that comes to mind when a color's name is referred to (Keyes 1993; Agoston 1987). Keyes (1993) simply calls hue "simple color as in red, yellow, green, blue-green, etc" (p. 650). Agoston (1987) goes into more detail:

> When we look at a red light, we perceive a red hue. It is difficult to explain just what the perception of a red hue is, just as it is difficult to explain the perception of bitterness or the aural perception of shrillness. It is sufficient to our purpose to say that when we utter or write the word "red," or the words "blue" or purple," we are conveying to others the idea of a particular hue. (p. 12)

Hue has also been called a color's pigment (Mackiewicz 2009). Besides four exceptions called unique hues, hues themselves are mainly viewed as mixtures of greens, yellows, reds, blues, and oranges (Agoston 1987). Kimball and Hawkins (2008) define hue more scientifically as "a human perception of wavelengths of light" (p. 249).

Value

Hue is only a part of what makes up the concept of color. Value or brightness is another important component. Unlike hue, there are more concrete definitions for value (Keyes 1993; Mackiewicz 2009; Agoston 1987). Keyes (1993) defines value as "the lightness and darkness, relative 'gray-value' of colors" (p. 650). Mackiewicz's (2009) defines it similarly, saying value is the lightness or luminance of color. She also adds that value is related to the amount of light that an object reflects (p. 4). Value has also been termed as brightness. Agoston (1987) refers to value as brightness, defining it as "an attribute of the illumination in which a nonisolated object is viewed" (p. 14).

Saturation

The last property of color is saturation, also known as chroma. In definition, saturation is closely linked with hue (Agoston 1987; Mackiewicz 2009). Agoston defines saturation as "an attribute of perceived color according to which we judge the *relative* amount of the hue component in the color" (p. 13). Mackiewicz (2009) agrees with this understanding, saying saturation is the degree of how much a hue is present. Keyes (1993) calls saturation a few

different terms such as intensity, purity, or chroma—relative brilliance or dullness in a color.

Stances on Color Theory

Color theory and how colors are perceived and linked with color terms have intrigued many researchers, theorists, and writers for years (Jameson 2005; Adams and Osgood 1973; Berlin and Kay 1991; Puhalla 2008; Dedrick 1998; Grieve 1991; Ozgen 2004). Research, debates, books, and articles have divided color perception into two stances: universalist and relativist. These two viewpoints contrast starkly about how color and semantics are perceived and developed.

Universalist stance

The universalist stance claims that in any culture or language, there are color terms or a basic model that is universally the same (Jameson 2005; Dedrick 1998; Berlin and Kay 1991; Ozgen 2004; Adams and Osgood 1973; Puhalla 2008). Dedrick (1998) writes that the universalist stance supposes there are constraints on color naming that are determined by biology, not culture. Jameson (2005) adds that the universalist stance "asserts that although color naming differences exist across cultures, they are largely explained by a model of pan-human shared color experience; and this determines the nonarbitrary basis by which all cultures categorize and name color sensations" (p. 102).

Back in 1969, Berlin and Kay advanced a new theory on color perception and color terms (Ozgen 2004). They believed there were eleven "universal" color terms present in any culture, no matter the differences in language (Ozgen 2004). According to Berlin and Kay (1991), their research "strongly indicates that semantic universals do exist in the domain of color vocabulary" and "appear to be related to the historical development of all languages in a way that can properly be termed evolutionary" (p. 1). They proposed the basic color terms evolved over time; any differences in the color terminologies were largely due to differences in the evolutionary stage (Ozgen 2004).

There are some explanations for why universal color terms appear (Puhalla 2008; Adams and Osgood 1973). Social scientists believe perceived colors and their order and harmony may be related to a common evolutionary human trait that has continued for many centuries (Puhalla 2008). Adams and Osgood (1973) propose three explanations for why there may be universal color terms: physiological, environmental, and cultural. Similar color terms may arise from the physiology of vision and wavelengths of light, or they may originate from similar environmental features like blue skies and green plants, which are viewed positively (Adams and Osgood 1973). The cultural aspect is explained through common cultural beliefs, which come from ancient origins or recent cultural influences (Adams and Osgood 1973).

Relativist stance

In comparison, the relativist stance reasons that color terms are determined by cultural and linguistic factors (Jameson 2005; Dedrick 1998; Grieve 1991; Ozgen 2004). Jameson (2005) explains in detail, saying "certain social and linguistic factors varying across

cultures contribute to color categorization and naming in ways that supplant what others attribute to universally prevalent opponent color appearance phenomenal channels" (p. 98). Color and their categories, then, can be seen through people's social experiences (Dedrick 1998). Grieve (1991) believes color perception is highly individualized, not universal like Berlin and Kay proposed, and dictated by ethnic preferences, culturally specific experiences, and practices.

There are some explanations for the relativist stance (Ozgen 2004; Jameson 2005). The relativist stance is primarily linked to the famous *linguistic relativity hypothesis* which suggests that language can influence and shape thought (Ozgen 2004). In one study, researchers directed participants in a certain country's region to discriminate between similar color hues (Ozgen 2004). They found that by using a new color category, participants could easily distinguish similar color hues through perceptual training (Ozgen 2004). Ozgen (2004) summarizes the study: "The demonstration that color perception can be modified through learning indicates that the process of learning a language may influence or even shape the way people perceive colors" (p. 97). Jameson (2005) theorizes that the relativist stance is connected to varying sociocultural influences that produce differences in cross-cultural color naming.

Color's Global Effect on People

Color influences people, shaping their opinions and feelings. Its role may be subtle and subconscious, but there is plenty of evidence that color does affect people and their emotions (Richards and David 2005; Adams and Osgood 1973; Grieve 1991; Vanka and Klein 1995; Hupka, Zaleski, Otto, Redil, and Tarabrina 1997; Madden, Hewett, and Roth 2000). However, color's effect on people's emotions is not constrained to a local area, culture, or language. Around the world, studies have been conducted on people to gauge their emotional reactions to colors (Adam and Osgood 1973; Madden et al. 2000; Hupka et al. 1997).

Color's effect on emotions

Scientists and researchers commonly agree that decorative features like color have an emotional and aesthetic appeal to viewers (Richards and David 2005; Hupka et al. 1997; Madden et al. 2000; Grieve 1991; Puhalla 2008). Madden et al. (2000) summarize, "Color influences both human behavior and human physiology" (p. 92). Grieves (1991) adds, "It is clear that colours are associated with different moods, feelings, or situations although a wide variety of associations are given" (p. 1322). Madden et al. (2000) give a real-life example:

> When asked how to lower stress in the workplace, Ward did not suggest another workshop; he simply said, "paint the walls—the right colors in the right place can make an exciting or calming difference. (p. 92)

Global color meanings

Color possesses a global appeal to people, especially to their emotions. Researchers, whether coming from a universalist or relativist viewpoint, have found similarities and dissimilarities in how people react emotionally to colors (Adam and Osgood 1973; Hupka et al. 1997; Madden et al. 2000; Richards and David 2005; Grieves 1991). Hupka et al. (1997) say, "Speakers of unrelated languages tend to relate colors and emotions in similar ways" (p. 157). For example, the color red has consistently been linked to "warmth", "violence", "passion", and "anger" (Richards and David 2005; Adams and Osgood 1973; Hupka et al. 1997).

Other colors demonstrate similarly universal effects. Cooler colors like blue and purple suggest positive and negative connotations like "tranquility" or "envy" (Richards and David 2005; Hupka et al. 1997). Hupka et al. (1997) add, "There is empirical evidence that terms with negative connotations (e.g., sadness, fright, not good) are associated across cultures with colors in the purplish and yellow-red end of the light spectrum" (p. 167). The color green advances emotions of "restfulness", "goodness", and "life" (Richards and David 2005; Adams and Osgood 1973; Grieve 1991). Black is universally viewed with negative traits like "death", "bad", "strong", and "fear" (Richard and David 2005; Adams and Osgood 1973; Hupka et al. 1997).

However, there are colors that have very different meanings within certain cultures (Hupka et al. 1997; Madden et al. 2000). Green, while having many positive connotations, is linked to envy and jealousy in the United States while some European countries see yellow as representing these emotions (Hupka et al. 1997). Madden et al. (2000) report in a cross-cultural study about colors in marketing that "black and red also received high liking ratings, yet in many cases, their meanings are considerably different" (p. 101).

Color Theory in the Workplace

Color has been utilized in various areas of the business world. However, technical communicators seem somewhat reluctant to fully embrace using colors in their jobs (Mackiewicz 2009; White 1991). However, color can be a powerful and effective tool for technical communicators in many areas like organizing information, providing signal cues, and distinguishing hierarchal levels in texts (White 1991). Mackiewicz (2007) recognizes the need for better understanding and usage of color in the workplace:

> As technical communicators, we realize that we should know something about color theory so that we can choose colors and color combinations that increase documents' usability. We know that color can do more than just dress a document or create visual interest. We also realize that we should know something about the practice of using color effectively and methods of obtaining the colors we intend. (p. 3)

Rhetorically Organizing Information

Color has a unique ability to affect print and digital messages in decorative and rhetorical ways (Richards and David 2005; Puhalla 2008; Vanka and Klein 1995; White 1991) Color

communication, when used properly, can aid users to view, decipher, understand, and experience many types of information systems in a meaningful manner, leading to effective usability (Puhalla 2008). White says, "Color must be used to make the information clear, lucid, powerful—faster" (p. 346).

Texts

Color's relationship with text can significantly influence a document's effectiveness (Keyes 1993; White 1991; Mackiewicz 2009). Each possesses different strengths and weaknesses, and technical communicators should use them as complementary tools (Keyes 1993). As a tool, color can enhance a text's' legibility through contrasting the text with the background (Keys 1993; White 1991; Mackiewicz 2009). White (1991) details a technical communicator's thought process in this area:

> Should the background be in color and the foreground in black, or should the background be in black and the foreground picked out in color? It depends on what you are trying to do. Everything always depends on what you are trying to do. (p. 349)

Mackiewicz (2009) adds that technical communicators will most likely be concerned about the readability of their print and online documents and that they should pay close attention to the background and foreground of a document.

Signaling cues

Colors can also be used as signaling cues in documents (Puhalla 2008; Keyes 1993; Mackiewicz 2009; White 1991; Kostelnick and Roberts 2011). Puhalla (2008) writes, "Ordering color according to its three attributes can produce a visual hierarchy, assisting a person's ability to assign a prescribed order of dominance and importance to information" (p. 201). As signaling cues, color can focus attention, group objects together, and create specific points of information (Keyes 1993). Its effectiveness, however, depends on the location, elements, differences in color cues, and what characteristics are used (Keyes 1993). Signaling cues can help readers understand the relationships in a document (Mackiewicz 2009).

Hierarchal levels

Not only can color enhance text and signaling cues, but it can also help users perceive hierarchy (Puhalla 2008; Mackiewicz 2009; Keyes 1993; White 1991). Puhalla (2008) writes, "Controlling the visual relationship of hue, value, and chroma contrast can significantly assist a person's cognitive ability to assign importance and dominance to a controlled color structure" (p. 199). When structured objectively, color can create a visual hierarchy and understandable order (Puhalla 2008).

Misuse of Colors

Color offers new design opportunities for technical communicators. However, especially inexperienced and uninformed information designers can frequently use them ineffectively (White 1991; Keyes 1993; Vanka and Klein 1995; Madden et al. 2000). White warns technical communicators:

> Unfortunately, color is a material so beset with silly misunderstandings and imagined magic that it is the editor's worst temptation. It is perhaps even more difficult to exploit simply and forthrightly than to use type simply and forthrightly. (p. 347)

Colors used badly in print and online documents can distract users, decrease their performance, and increase difficulty for the users (Keyes 1993). Not only can colors be destructive in an ordinary workplace setting, but its misuse can have negative consequences on a cross-cultural scale (Madden et al. 2000; Vanka and Klein 1995; Kimball and Hawkins 2008). Certain colors have different meanings, positive and negative, in different cultures, which can potentially lead to misunderstandings and perceived offense (Madden et al. 2000; Vanka and Klein 1995; Kimball and Hawkins 2008). White (1991) offers advice for properly using colors: "Color judgment should not be based on subjective, personal 'liking.' It must be used deliberately, fulfilling specific needs and purposes. It is not an artistic material but a communication material" (p. 349).

Analysis

Color is a potentially powerful tool for effective communication and productive results. However, technical communicators seem reluctant to use color fully in their work. They may fear inadvertently misusing color, which could result in misunderstandings and negative consequences that they could have avoided. Despite the risks and uncertainty, technical communicators should not avoid using colors. They may not realize it, but color can be an extremely useful tool. Color, utilized properly, can set a product or piece of information apart from its competition and help users better comprehend and navigate the information.

Be Aware and Informed

Being aware of color's subtle effects is important for technical communicators. It is easy to underestimate or even forget that color can subtly affect people's opinions and moods. Technical communicators should not forget that color is a powerful stimulant that has connotative meanings for users. They also need not fear using colors; being afraid or uncomfortable can hinder a technical communicator's ability to producing excellent content. Instead, technical communicators must only be aware that they can utilize color well. They must remember that color can be a hit or miss if not used appropriately. Knowing that color can be used as a powerful tool is a start to using color effectively.

The next step is be informed and knowledgeable about color. Once aware and comfortable, technical communicators should not recklessly use color in their work. They need to make informed and deliberate choices in their use of color. If they don't, they risk misusing color, hurting their product's usability and sending the wrong messages to the audience. Misusing color can not only have local and national consequences but also global ones. With technology and social media connecting the world every day, technical communicators must always consider how color is perceived and used in different cultures. What is seen as

positive and strong in one country could be viewed as weak and negative in another. Despite the potential risks, color can enlarge a technical communicator's toolset and open up new ideas for designing information. Technical communicators just need to be aware and informed of how color can affect information and users. Today, there are many resources, print and online, that technical communicators can use to reference for their work.

Use the Universalist and Relativist Stances

Once technical communicators are comfortable, aware, and informed of how to use color, they can apply the universalist and relativist stances of color theory. Despite their differences, both viewpoints offer beneficial insight and tips for how to efficiently use colors in the workplace. The universalist stance allows technical communicators to employ colors that are generally well-received around the world or in certain regions and to carefully apply certain colors that are universally not viewed as positive, such as the color black.

While the universalist stance provides a broad framework to assess color, the relativist stance demands that technical communicators dig deeper. They should examine how selected colors are perceived within a specific culture or region and how those colors will be received in different contexts. Cultural and linguistic factors can determine how countries view colors differently from others.

If an American technical communicator decided to use various shades of yellow, purple, and green in a product aimed towards a global audience, it would be wise to double check the colors' connotative meanings in different cultures. Americans often associate yellow with sunshine and cheerfulness, purple with royalty and high quality, and red with strength and activeness. However, in other countries, yellow is linked with envy, purple to anger, and red with jealousy (Hupka et al. 1997). The technical communicator needs to be aware of the potential cultural differences in the colors' meanings and check to make sure the colors will not offend or send the wrong messages to the directed audiences.

Apply Color Intentionally

Besides using color to send subtle emotional messages to users, technical communicators can utilize color theory to organize information within a text. However, they must make careful and deliberate choices when adding color to their work. Throwing color on random areas of information can confuse users and hinder the document more than it helps. Additionally, users can discern when an information designer has misused color, which could potentially lead them to view the designer's work as inefficient, shoddy, unhelpful, and of low quality. Such reactions would not be what the information designer had desired and anticipated.

Color can help organize blocks of information within a text. By contrasting a text's color with its background, color can allow users to better read and distinguish the words in print and digital formats. Additionally, color can highlight certain words, making them pop from

a mass of text. Technical communicators could also utilize color to help reach users who might have a more difficult time reading information online.

Color can not only aid in a document's legibility, but it also can act as an effective signaling cue. Color can signal where one section of information ends and another begins, group pieces of relevant data together, and reveal relationships within a document. However, technical communicators must carefully decide which colors should be used and where it should be placed. In a U.S. safety manual, for example, the color red means warning or danger. Users from an American background will immediately notice the red signaling cue and likely read the information. In other cultures, the connotative meaning of danger might be relayed in a different color, so technical communicators should research what colors might mean in different cultures and contexts. Doing so might prevent injury or even save someone's life.

Lastly, color can show hierarchal levels in documents, especially long ones. Headings combined with color will stand out from the main text and allow users to skim and navigate the information. Readers will easily distinguish the levels of importance and determine where their attention should go first. Hierarchal levels provide structure and organization for a document. Adding color will enhance the organized information.

The benefits of using color outlined above are just the surface of what technical communicators can do with color theory. The scope of this paper can only look at a few benefits, but there are numerous possibilities that information designers can employ to better their documents. Perhaps the only boundaries that limit them from effectively using color are their imaginations, fears, and uncertainties.

Conclusion

People have always used color in various aspects of life and history, but only recently has its influence on the human mind and emotions become more obvious. Despite differing opinions of how color is perceived and understood, there is no doubt that color is a crucial part of the human experience that bleeds into the workplace.

Technical communicators will often wonder what they could do to make their documents stand apart from the rest of the competition that clamors for attention. They may be surprised to realize that they do have a tool that could help them achieve their goal: color. It is a powerful, subtle, and influential stimulant that has emotional, psychological, and cross-cultural consequences for the users. Unfortunately, technical communicators often tend to shy away from using color. This should not be the case. If used with deliberate and informed intent, color can create an organized, understandable, clear, and potentially memorable product that users will comprehend and enjoy using.

Technical communicators should be willing to apply color to their work, but they must be informed and knowledgeable about how to use it. Something as simple as color can

potentially lead to positive or negative consequences. Despite the risks, using color as a tool can and provide avenues for creativity and innovation as well as better usability and understanding. Technical communicators are information specialists, constantly looking for ways to better convey meaning to their users. It is unfortunate then that they are reluctant to use a powerful but subtle tool that is readily available at their fingertips.

Bibliography

Adams, Francis M., and Charles E. Osgood. "A Cross-Cultural Study of the Affective Meanings of Color." *Journal of Cross-Cultural Psychology* 4, no. 2 (1973): 135-156. Accessed: January 30, 2017. DOI: http://journals.sagepub.com/doi/abs/10.1177/002202217300400201

Agoston, G.A. *Color Theory and Its Application in Art and Design*. New York: Springer-Verlag berlin Heidelberg, 1987.

Allott, R.M. "Some Apparent Uniformities Between Languages in Colour-Naming." *Language and Speech* 17, no. 4 (1974): 377-402. Accessed January 30, 2017. DOI: http://journals.sagepub.com/doi/abs/10.1177/002383097401700409

Berlin, Brent, and Paul Kay. *Basic Color Terms: Their Universality and Evolution*. Los Angeles: University of California Press, 1991.

Dedrick, Don. "The Foundations of the Universalist Tradition in Color-Naming Research (and Their Supposed Refutation)." *Philosophy of the Social Sciences* 28, no. 2 (1998): 179-204. Accessed: January 30, 2017. DOI: http://journals.sagepub.com/doi/abs/10.1177/004839319802800201

Grieve, K.W. "Traditional Beliefs and Colour Perception." *Perceptual and Motor Skills* 72, no. 3 (1991): 1319-1323. Accessed January 30, 2017. DOI: http://journals.sagepub.com/doi/pdf/10.2466/pms.1991.72.3c.1319

Hupka, Ralph B., Zbigniew Zaleski, Jurgen Otto, Lucy Reidl, and Nadia V. Tarabrina. "The Colors of Anger, Envy, Fear, and Jealousy: A Cross-Cultural Study." *Journal of Cross-Cultural Psychology* 28, no. 2 (1997): 156-171. Accessed: January 30, 2017. DOI: http://journals.sagepub.com/doi/abs/10.1177/0022022197282002

Jameson, Kimberly A. "On the Role of Culture in Color Naming: Remarks on the Articles of Paramei, Kay, Roberson, and Hardin on the Topic of Cognition, Culture, and Color Experience." *Cross-Cultural Research* 39, no. 1 (2005): 88-106. Accessed January 31, 2017. DOI: http://journals.sagepub.com/doi/abs/10.1177/1069397104267886

Keyes, Elizabeth. "Typography, Color, and Information Structure." *Technical Communication* 40, no. 4 (1993): 638-654. Accessed January 31, 2017. DOI: http://www.jstor.org/stable/43090213?seq=1#page_scan_tab_contents

Kimball, Miles A., and Ann R. Hawkins. *Document Design: A Guide for Technical Communicators*. Boston: Bedford/St Martin's, 2008.

Kostelnick, Charles, and David D. Roberts. *Designing Visual Language: Strategies for Professional Communicators Second Edition*. Boston: Pearson Education, Inc., 2011.

Mackiewicz, Jo. "Color: The Newest Tool for Technical Communicators--Redux." *Technical Communication* 56, no. 1 (2009): 3-13. Accessed January 18, 2017.

Madden, Thomas J., Kelly Hewett, and Martin S. Roth. "Managing Images in Different Cultures: A Cross-National Study of Color Meanings and Preferences." *Journal of International Marketing* 8, no. 4 (2000): 90-107. Accessed January 30, 2017. DOI: https://archive.ama.org/archive/ResourceLibrary/JournalofInternationalMarketing/Pages/2000/8/4/3950118.aspx

Ozgen, Emre. "Language, Learning, and Color Perception." *Current Directions in Psychological Science* 13, no. 3 (2004): 95-98. Accessed January 30, 2017. DOI: http://journals.sagepub.com/doi/full/10.1111/j.0963-7214.2004.00282.x

Puhalla, Dennis M. "Perceiving Hierarchy through Intrinsic Color Structure." *Visual Communication* 7, no. 2 (2008): 199-228. Accessed January 30, 2017. DOI: http://journals.sagepub.com/doi/abs/10.1177/1470357208088759

Richards, Anne R., and Carol David. "Decorative Color as a Rhetorical Enhancement on the World Wide Web." *Technical Communication Quarterly* 14, no. 1 (2005): 31-48. Accessed January 30, 2017. DOI: http://0-web.a.ebscohost.com.library.cedarville.edu/ehost/detail/detail?sid=f8c04874-876d-46b6-a641-5db8a53263c0%40sessionmgr4007&vid=0&hid=4106&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#AN=16158498&db=oih

Vanka, Surya, and David Klein. "ColorTool: An Information Tool for Cross Cultural Design." *Human Factors and Ergonomics Society* 39, no. 5 (1995): 341-345. Accessed January 30, 2017. DOI: http://journals.sagepub.com/doi/abs/10.1177/154193129503900510

White, Jan V. "Color: The Newest Tool for Technical Communicators." *Technical Communication* 38, no. 3 (1991): 346-351. Accessed January 19, 2017. DOI:https://www.jstor.org/stable/43095747?seq=1#page_scan_tab_contents