

AN EXPLORATORY STUDY ON COLOUR PSYCHOLOGY IN MARKETING: A TECHNO- LEADERSHIP PERSPECTIVE

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Abstract

Colours are always special and symbolises liveliness and represents feelings, perceptions, personality, emotions, psychological traits, disposition of feelings etc. The subject of Colour psychology is not new to marketing application and either directly or indirectly plays a very meticulous and indispensable role for marketers, in a very scientific, technical and behavioural perspectives. A leader needs to be an expert in this area, in the field of management or even for simple marketing strategy and recent scientific developments. The leaders of present generation needs to have a closer look at the colour perspective in their management style of things. As research shows, it's likely because elements such as personal preference, experiences, upbringing, cultural differences, context, etc., often muddy the effect individual colors have on us. An interest of psychology, and particularly applied psychology in the impact of colour on human functioning has a long history; however, it has fairly limited research achievements. Some more systematic empirical studies in the field appeared at the end of the last century; however, many of them suffer from methodological shortcomings and fail to encompass a correlational analysis which is a norm in modern psychology. To illustrate this fact let us consider the results of research on the colour red.

Keywords: Colour; Psychology; Personality; Emotion; Favourite; Context ; Preferences; Experiences

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Objectives: (i) to understand the importance of Colour Psychology Applications in Marketing Strategies

(ii) to evaluate how and what are the colours that impact on the consumers in influencing their buying behaviour

(iii) to find out the latest developments in the application of colour psychology in marketing

Scope of the Study; Contribution to applications in Marketing Psychology and Leadership Psychology

Review of Related Literature:

Elliot and Maier (2014) suggested that research on the psychology of colour has been conducted within the framework of applied psychology for a few decades (see many studies published in the Journal of Applied Psychology as early as the pre-war period (e.g., Katz, & Breed, 1922; Schiller, 1935; Philip, 1945; Walton & Morrison, 1931).

Fernandez and Rosen's (2000) studied, colourful advertisements attracted greater attention among the participants – and so visibility in the telephone book's Yellow Pages was improved. However, it is important that when the participants were taking a decision which company to call, the colour of the commercial was an advantage only when it was consistent with the advertisement's content. In the opposite case, it decreased the effectiveness of the advertisement. In the follow-up study (Lose, Rosen, 2001) these outcomes were confirmed and, additionally, it was shown that if the colour does not convey any information about product quality (e.g., clear, blue water in the commercial of holidays in the Caribbeans), it is not more efficient than black and white commercials. Similar outcomes were obtained by Moore and others. (2005).

Mantua, (2007) agree on colour having an impact or effect on a brand's perception (identification, identity and awareness, attitudes, evaluation and choice). For example, blue appears to be a highly positive colour, as blue stores, products and websites are rated, among others 12 Piotr Sorokowski, Magdalena Wrembel things, as more relaxing, and more trustworthy (Alberts & van der Geest, 2011; Lee & Rao, 2010). However, little is known about why a

particular colour might be perceived and interpreted in a specific way (Whitfield & Wiltshire, 1990).

Holmes, Fouty, Wurtz and Burdick's (1985) “Enough studies have been reported to present a consistently inconsistent picture of the relationship”. As indicated in the introduction, even the most commonly acknowledged observation used in popular science publications that “the red colour stimulates” is inconsistent with the majority of scientific studies on this topic (e.g., Ainsworth, Simpso, & Cassell, 1993; Hackney, 2006; Hatta et al. 2002). It must be admitted, however, that it seems obvious that some colours have certain connotations. Even if the colour red does not stimulate at the physiological level, the whole history demonstrates that this colour is a symbol of fire, energy and is a metaphor of war, rage and anger (Mahnke, 1996).

Rutchick, Slepian and Ferris (2010) showed that using a red pen can bias the evaluations of people. Participants using red pens to correct essays marked more errors and awarded lower grades than the people using blue pens. In another context, the colour red has quite the opposite connotation as it might enhance the perceived sexual attractiveness of a person (Elliot & Niesta, 2008). Additionally, the symbolic value of colours is culturally dependent (Huang, 1993; Mantua, 2007; Oberascher, 2008). Of course, meanings attached to some colours may be more or less pan-cultural, such as the colours of traffic lights, or blue for sea and sky, and green for nature (Morgan & Welton 1987), while some are regional and unique to specific cultures. However, there have not been any systematic studies investigating this topic. Summing up, in comparison to common beliefs about the functions and qualities of colours, their practical application is much narrower.

Sawer (2006), colours used by political parties have a very long history, going back to ancient Greece and Rome. At present, colours applied by particular ideologies usually have certain historical connotations. Red used to be generally the colour of revolution, war and radicalism, for example in the French Revolution. Today, modernising Labour parties tend to shy away from using red unless in the form of the red rose of the Socialist International rather than the blood-soaked flag of a popular revolt. On the 13 Color studies in applied psychology and social sciences: An overview other hand, green has become a symbol of ecological parties. This

symbolic shorthand may have had its origins in the ‘green bans’ imposed by the Builders Labourers Federation (BLF) on development projects in Sydney in the early 1970s (Sawer, 2006).

Hill and Burton (2005) suggested that a red outfit might stimulate the sportsmen wearing it, increasing their “will to fight” and dominate the opponent. Such an assumption is probably not true. For example, Hackney (2006) demonstrated that persons’ levels of testosterone did not alter only because they were wearing red or black T-shirts. It seems that the observed effect is rather dependant on the “observer”, in other words, the referee or the “red” sportsman’s opponent and not the person dressed in red.

Hagemann, Strauss, and Leming (2008) who demonstrated that referees assessing the same taekwondo fight, in which the opponents’ colours were changed, assigned approximately 13% more points to the “red” sportsman than to the “blue” one. Additionally, Sorokowski & Szmajke (2007) found that the colour of T-shirts influenced only the competitors’ bravery and aggressiveness and not the perception of their technical and physical abilities.

Rowe, Harris and Roberts (2005) and Matsumoto, Konno, Hata (2007) showed that judokas in blue outfits won more often than the judokas in white outfits. The authors suggested that sportsmen’s successes in a certain colour t (also red over blue uniforms) might result from how movements of certain colours are perceived. However, see also the contradictory results of Dijkstra and Preenen (2008). So far, there has been no convincing evidence confirming the “red wins” effect in team sports.

Attrill and others (2008) suggested that this effect was observed in football. They demonstrated, for example, data from the English league since 1947 and an analysis of the results of the English national team playing in white or red T-shirts. However, no such effect was observed in two further studies – one investigating Polish football league results (Szmajke & Sorokowski, 2006) and another one German league results (Kocher & Sutter, 2008). 15 Color studies in applied psychology and social sciences: An overview Summing up, the “red wins” effect is observable in martial arts, in which the opponents fight directly with each other rather

than being on a sports team. Although its origin and mechanism is not fully clear, it seems to be primarily related with incorrectly perceiving sportsmen in red outfits as more active, brave and aggressive. Colours in psychological diagnoses Despite many methodological problems, colours have long been used in psychological diagnoses.

Pfister's Colour Pyramid test (Schaie, 1963). Again, no independent studies confirming its psychometric qualities or verifying its practical usage have been presented in the scientific literature (at least in English). In this test the patient, using 24 colourful blocks, is supposed to create a pyramid he or she likes and then a pyramid he or she does not like. Finally, the Lowenfeld Mosaic Test (Lowenfeld 1952, Woodcock, 1984) is the last relatively frequently used test. It is applied mainly to children. People create colourful pictures with the collection of mosaics, which are later interpreted by the psychologist. In conclusion, despite many methodological problems, colours have long been used in psychological diagnoses.

Marks (1975) noted that the black vs. white distinction is related to vowel 'pitch', while the red-green distinction correlates with the ratio of second to first formant frequency of vowels.

Jakobson's (1962) claims are in line with synaesthetic research results that point to a strong correlation between auditory pitch and visual luminance as well as a general tendency to associate high pitch sounds with light colours and low tones with darker hues (e.g. Simner et al. 2005, Ward et al. 2006). Relatively few studies to date have explored this synaesthetic-like phenomenon of making associations between colours and auditory stimuli.

Flagg and Stewart (1985) a study on consonants perception by using primary colours, and their findings demonstrated that colour can be used to study speech perception.

Dailey and others (1997) investigated the relation between creativity, synaesthetic tendencies and physiognomic perception measured by rating colours using adjectives with emotional connotations. Their results showed that creative individuals have access to a primary thinking process that assumes a unity of different sensory modalities, since these persons exhibited stronger associations between colours and vowels, as well as tones and emotional terms. A series

of experiments investigating sound-colour associations in Polish and English sound systems in a non-synaesthetic population were conducted by Wrembel (2009), Wrembel and Rataj (2008), Wrembel and Grzybowski (2011).

Guéguen and Jacob (2013) demonstrated that coffee was perceived to be warmer when served in a red cup, whereas Ross, Bohscheid, and Weller (2009) found that red wine was perceived to have a better flavour when it was served in a blue glass. Other interesting findings in similar experiments were reported by Geier, Wansink, & Rozin, (2013) or Piqueras-Fiszman and Spence (2012). From a methodological standpoint, the literature on colour psychology has seen several improvements in the past decade. However, the need for further modifications remains, and it concerns several areas, two of which will be briefly discussed here. First of all, researchers other than those representing the social sciences and humanities allow for the distinctions between various attributes of colours, such as saturation, in other words, how “intense” or “concentrated” a color is; hue (adding white and black pigment); and brightness/lightness, or, how light or dark a given colour is (Berns, 2011). Each of these colour attributes may influence psychological functioning (Camgoz, Yener, & Guvenc, 2003); so only one of them should be allowed to vary in a well-controlled experiment. However, the vast majority of research on colour in social studies has failed to allow for these distinctions. Therefore, we cannot fully explain which independent variables are responsible for the generated results of such studies. Secondly, researchers select colour stimuli unsystematically – which is very problematic – and introduce some bias in colour studies as different shades of yellow, blue or red are used as stimuli. Controlling colour attributes at the spectral level by using pre-matched stimuli or a spectrophotometer is necessary to conduct truly rigorous colour research.

Schwarz and Clore (1983) proposed the emotion-as-information hypothesis, in which people use their current affective state as information about the to-be-judged target object. That is, they integrate their current affective state with their evaluation of the target object (—how do I feel about it?|). Alternatively, in a memory-based model,

Isen and colleagues (1978) propose that a given affective state makes mood-congruent information in memory more salient, which, in turn, makes mood-congruent evaluation more likely. Although these two models differ from one another in their proposed psychological

mechanisms, both suggest that the judgment of a given target will be congruent with the individuals' current emotional state: that is, people's negative (positive) affect will lead to more negative (positive) evaluation of a given stimulus than they would if they were in emotionally neutral state. Using colors as target objects, the prediction would be that, relative to a neutral control condition, people in a negative (positive) affective state would provide more 6 negative (positive) evaluations of any color, independent of color tone (i.e., independent of the emotion tone of the color itself).

Cohen and Andrade 2004, Tsai 2007). One's evaluation of a target object, therefore, is determined by one's current affective state, one's projected affective state, and the extent to which one believes that the target object or behavioral experience can achieve or maintain the hedonistically positive state. As a result, relative to a control condition, negative affect may increase preference for the stimuli that make people feel better (Andrade 2005;

Tice, Bratslavsky, and Baumeister 2001), whereas positive affect may decrease preference for stimuli that would make people feel worse (Andrade 2005; Isen and Simmons 1978). In other words, sad people will approach target objects that present an emotion incongruent tone, whereas happy people will avoid target objects that display an emotion incongruent tone. There has been some evidence showing preference for emotionally incongruent aesthetic stimuli.

Knoblich and Zillmann (2002) showed that after a negative (vs. positive) performance feedback, participants listened to highly energetic and joyful music for longer periods. Similarly, Ireland, Warren and Herringer (1992) found that highly anxious individuals preferred emotion-incongruent, calm colors (i.e., pastel shades of color) relative to congruent, highly arousing ones (i.e., highly saturated colors).

Jacobson and Bender 1996; Palmer and Schloss 2010). evaluated multiple colors (20 ~ 24 colors), which allowed us to focus on general emotional tones across colors, independent of specific color characteristics. Finally, whereas the emotional state was manipulated across subjects, the emotional tone of the stimuli (e.g., happy vs. sad colors) was manipulated as a within-subjects variable across all the experiments.

Introduction: Colour in marketing and business psychology might fulfil many different functions as they attract attention, convey some information, or evoke certain emotions or motivations. The first of the above-mentioned functions, that is, attracting attention through higher visibility of a certain colour is obvious. Research regarding perception has shown that especially red and purple fulfil this function well, since they are noticed more quickly than other colours in the horizontal perspective (e.g., Koslow, 1985). Studies examining real advertisements have basically concentrated on black and white vs. colourful stimuli. Poor colour choice can also negatively change the impact of the message. Chances are there that it can be easily ignored. Even NASA is concerned about colour, enough so that they use online resources to help non-designers choose just the right shades. The psychology of colour as it relates to persuasion is one of the most interesting and most controversial aspects of marketing. Every business conversation today is about persuasion consisting of hunches, anecdotal evidence and advertisers blowing smoke about "colors and the mind." Hence this study is about how make colour selection with reliable research evidences on color theory and persuasion.

Misconceptions around the Psychology of Color: The colour psychology has become part of important business conversations with incredibly rapid visuals that sum up color psychology with awesome "facts" such as the colour plays vital role and is important in Branding. First, let's address branding, which is one of the most important issues relating to color perception and the area where many articles on this subject run into problems. There have been numerous attempts to classify consumer responses to different individual colors: but the truth of the matter is that color is too dependent on personal experiences to be universally translated to specific feelings. But there are broader messaging patterns to be found in color perceptions. For instance, colors play a fairly substantial role in purchases and branding. Researchers find that up to 90 percent of the snap judgments made about products can be based on color alone (depending on the product with the impact that the role of colour plays in branding, results from studies. Many research findings say about the relationship between brands and color hinges on the perceived appropriateness of the colour being used for the particular brand (in other words, does the color "fit" what is being sold). It also confirms that purchasing intent is greatly affected by colors due to the impact on the perception of a brand. This means that colors influence how consumers view the "personality" of the brand in question like for example who would want to

buy a Harley Davidson motorcycle if they didn't get the feeling that Harleys were rugged and cool, and many studies have revealed that our brains prefer recognizable brands, which makes color incredibly important when creating a brand identity. Many suggestions in the area of colour psychology is of paramount importance for new brands to specifically target logo colors that ensure differentiation from entrenched competitors like for example if the competition all uses blue, one can stand out by using purple. When it comes to picking the "right" color, research has found that predicting consumer reaction to color appropriateness in relation to the product is far more important than the individual color itself. So, if Harley owners buy the product in order to feel rugged, it is very well clear that the pink colour + glitter edition wouldn't sell all that well. Psychologist and Stanford professor Jennifer Aaker has conducted studies on this very topic via research on *Dimensions of Brand Personality*, and her studies have found five core dimensions that play a role in a brand's personality:

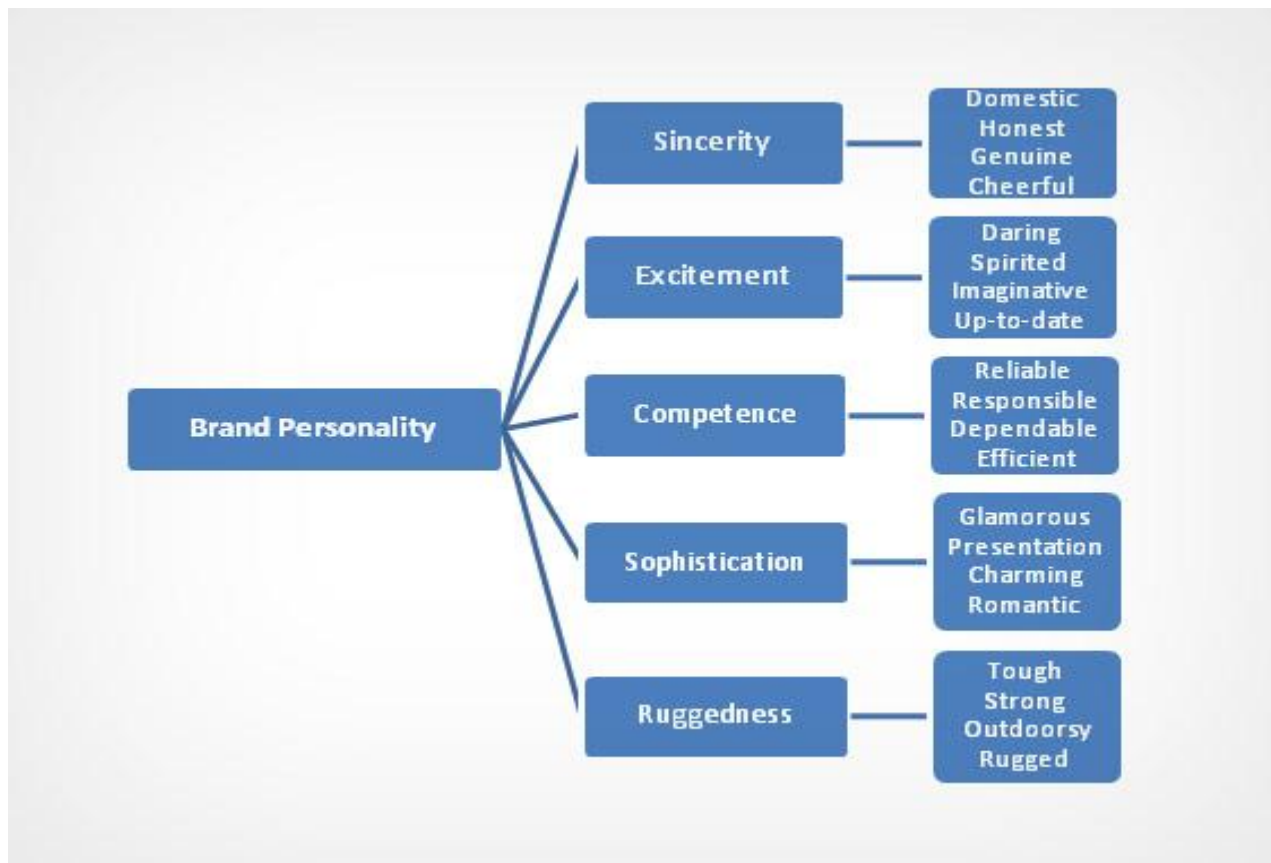
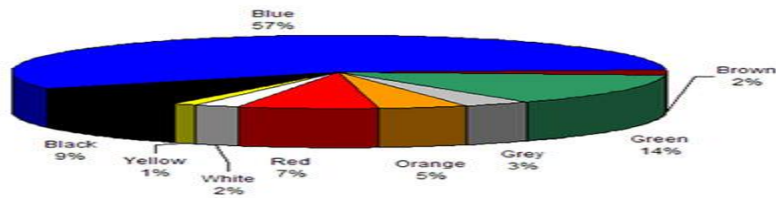
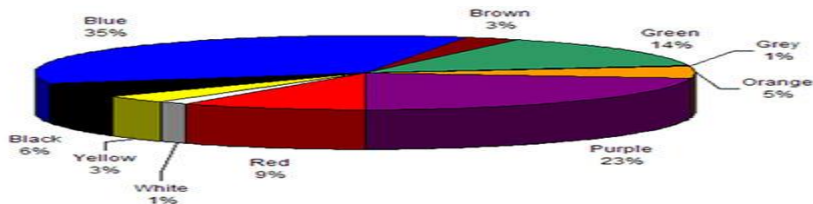
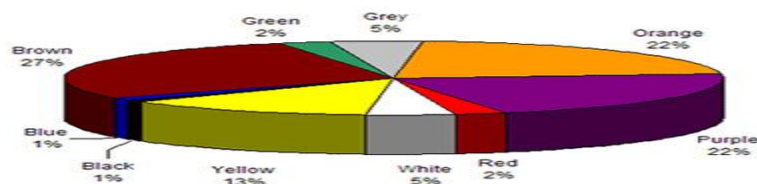
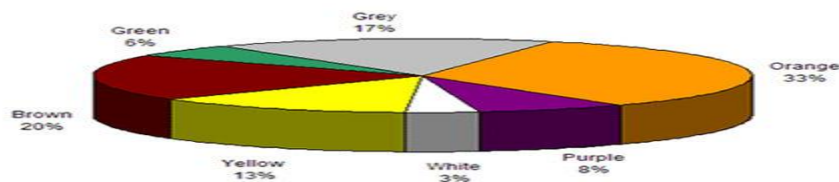


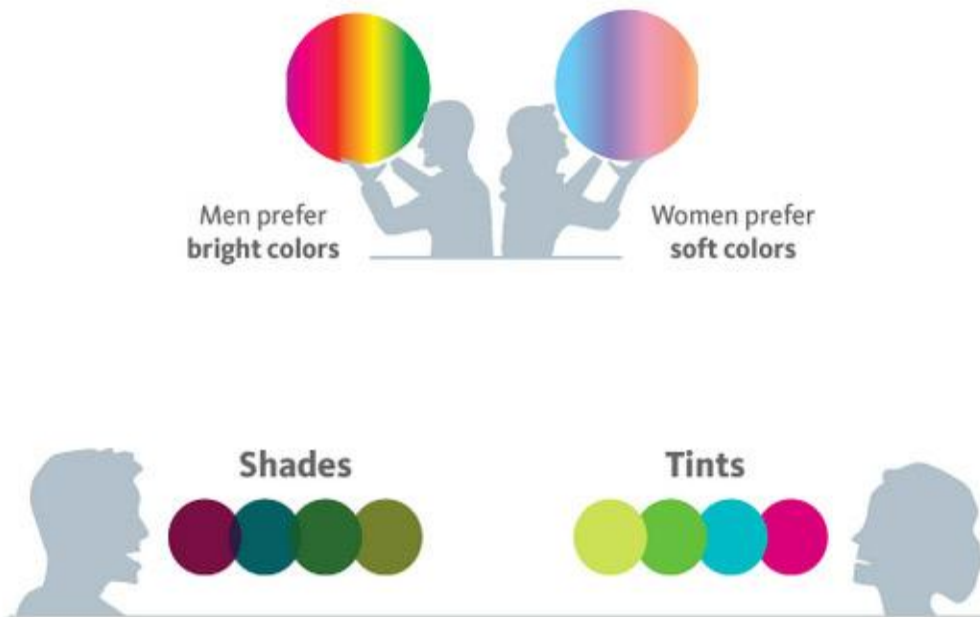
Figure:1: Brand Personality with colours adapted from Wikipedia.org

Research studies are showing that brands can sometimes cross between two traits, but they are mostly dominated by one. High fashion clothing feels sophisticated, camping gear feels rugged. Other researchers have found that there is a real connection between the use of colors and customers' perceptions of a brand's personality. Certain colors DO broadly align with specific traits (e.g., brown with ruggedness, purple with sophistication, and red with excitement). But nearly every academic study on colors and branding reveals that it's far more important for brand's colours to support the personality. Without this context, choosing one color over another doesn't make much sense, and there is very little evidence to support that 'orange' will universally make people purchase a product more often than 'silver'.

Research Findings on Color Preferences by Gender: Perceived appropriateness may explain why the most popular car colors are white, black, silver and gray, but is there something else at work that explains why there aren't very many purple power tools.

Men's Favorite Colors**Women's Favorite Colors****Men's Least Favorite Colors****Women's Least Favorite Colors****Figure:2: Colour Preferences of Men and Women: Source; Wikipedia.org**

The most notable points in these images is the supremacy of blue across both genders (it was the favorite color for both groups) and the disparity between groups on purple. Women list purple as a top-tier color, but no men list purple as a favorite color. (Perhaps this is why we have no purple power tools, a product largely associated with men?). Additional research in studies on colour perception and colour preferences show that when it comes to shades, tints and hues men seem to prefer bold colors while women prefer softer colors. Also, men were more likely to select shades of colors as their favorites (colors with black added), whereas women were more receptive to tints of colors (colors with white added):



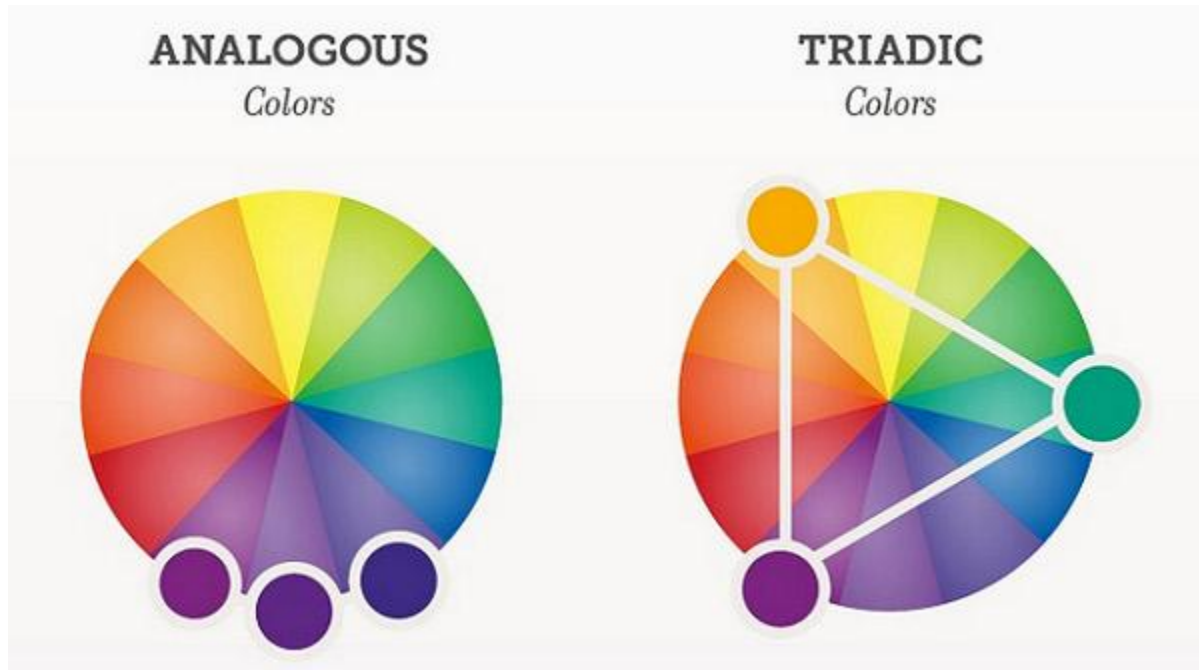
Source: kissmetrics

The above infographic from KISSmetrics showcases the disparity in men and women's color preferences. Keep this information in mind when choosing your brand's primary color palette. Given the starkly different taste preferences shown, it pays to appeal more to men or women if they make up a larger percentage of your ideal buyers.

Color Coordination + Conversions

Debunking the "best" color for conversion rates on websites has recently been a very popular topic (started here and later here). They make some excellent points, because it is definitely true that there is no single best color for conversions. The psychological principle known as *the Isolation Effect* states that an item that "stands out like a sore thumb" is more likely to be remembered. Research clearly shows that participants are able to recognize and recall an item far better (be it text or an image) when it blatantly sticks out from its surroundings. (The sign-up button stands out because it's like a red "island" in a sea of blue.) The studies *Aesthetic Response to Color Combinations* and *Consumer Preferences for Color Combinations* also find that while a large majority of consumers prefer color patterns with similar hues, they favor palettes with a highly contrasting accent color. In terms of color coordination (as highlighted in this

KISSmetrics graphic), this would mean creating a visual structure consisting of base analogous colors and contrasting them with accent complementary colors (or you can use tertiary colors):



Another way to think of this is to utilize background, base and accent colors to create a hierarchy (as Josh from StudioPress showcases below) on your site that "coaches" customers on which color means take action:

Why this matters: Although you may start to feel like an interior decorator after reading this section, this stuff is actually incredibly important in helping you understand the why behind conversion jumps and slumps. As a bonus, it will help keep you from drinking the conversion rate optimization Kool-Aid that misleads so many people. Psychologist and Stanford professor Jennifer Aaker has conducted studies on this very topic, and her paper titled "Dimensions of Brand Personality" points out five core dimensions that play a role in a brand's personality.

5 Dimensions of Brand Personality

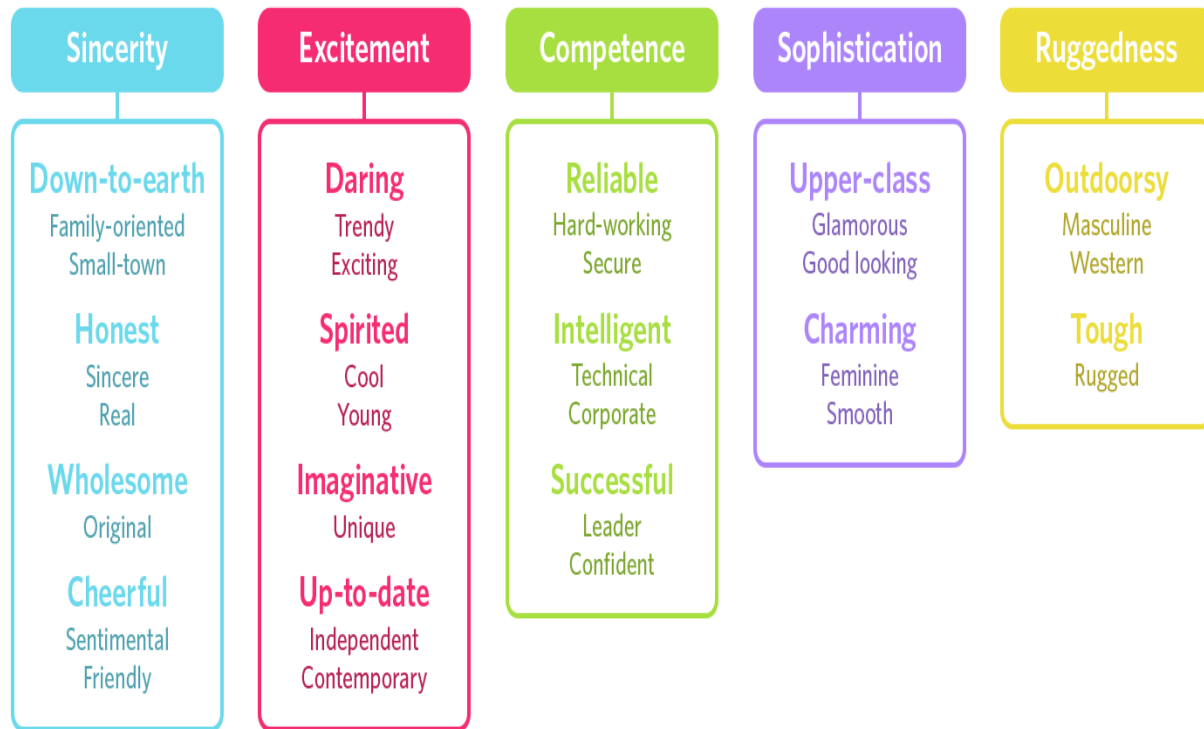
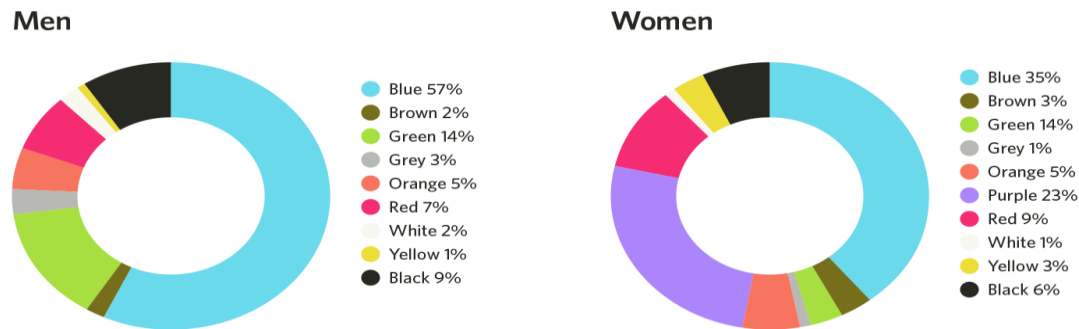


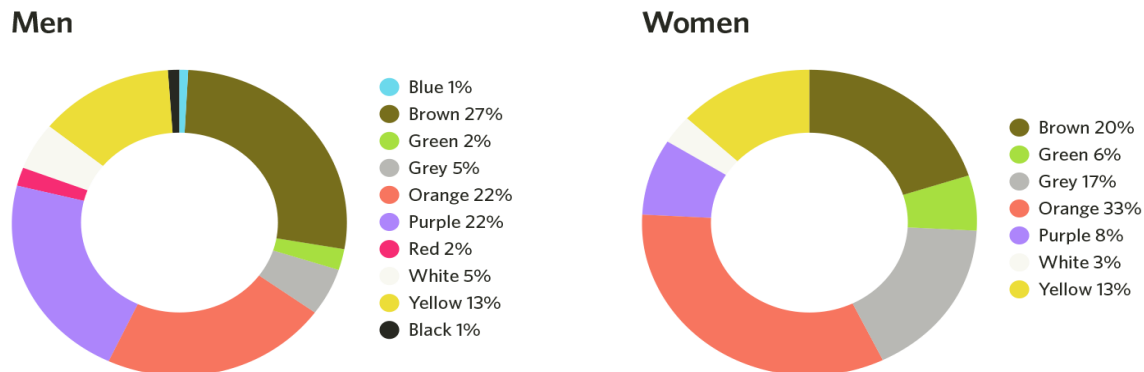
Figure: 3: 5 dimensions of Brand Personality; Source: wikipedia.org

Brands can sometimes cross between two traits, but they are mostly dominated by one. While certain colors do broadly align with specific traits (e.g., brown with ruggedness, purple with sophistication, and red with excitement), nearly every academic study on colors and branding will tell you that it's far more important for colors to support the personality you want to portray instead of trying to align with stereotypical color associations. Consider the inaccuracy of making broad statements such as "green means calm." The context is absent: sometimes green is used to brand environmental issues, like Seventh Generation, but other times it's meant to brand financial spaces, such as Mint. And while brown may be useful for a rugged appeal — see how it's used by Saddleback Leather — when positioned in another context, brown can be used to create a warm, inviting feeling (Thanksgiving) or to stir your appetite (every chocolate commercial you've ever seen). **Bottom line:** There are no clear-cut guidelines for choosing your brand's colors. "It depends" is a frustrating answer, but it's the truth. However, the context you're working within is an essential consideration. It's the feeling, mood, and image that your brand or product creates that matters.

Men's and women's favorite colors

**Figure:4: Men/Women Colour Preferences: Most Favorite: Source; www.wikipedia.org**

Men's and women's least favorite colours

**Figure:5: Men/Women's least Favorite Colours****Research findings on Colour coordination and conversions;**

The psychological principle known as the Isolation Effect states that an item that “stands out like a sore thumb” is more likely to be remembered. Research clearly shows that participants are able to recognize and recall an item far better — be it text or an image — when it blatantly sticks out from its surroundings. Two studies on color combinations, one measuring aesthetic response and the other looking at consumer preferences, also find that while a large majority of consumers prefer color patterns with similar hues, they favor palettes with a highly contrasting accent color. In terms of color coordination, this means creating a visual structure consisting of base analogous colors and contrasting them with accent complementary (or tertiary) colors:

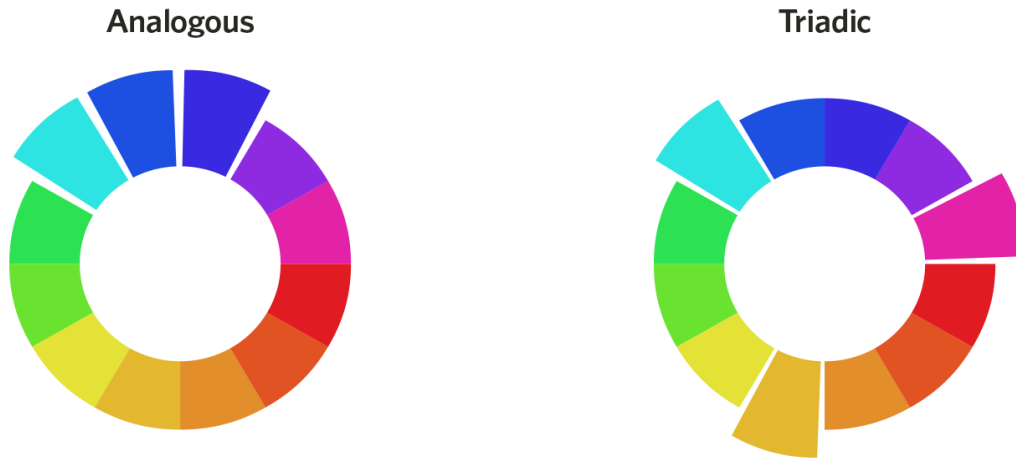


Figure:6: Colour Coordination and Conversions: Source: www.wikipedia.org

Although different colors can be perceived in different ways, the descriptive names of those colors matters as well. According to a study titled “A rose by any other name...,” when subjects were asked to evaluate products with different color names, such as makeup, fancy names were preferred far more often. For example, “mocha” was found to be significantly more likeable than “brown,” despite the fact that the subjects were shown the same color. Additional research finds the same effect applies to a wide variety of products; consumers rated elaborately named paint colors as more pleasing to the eye than their simply named counterparts. It has also been shown that more unusual and unique color names are preferable for everything from jelly beans to sweatshirts. For instance, crayon colors with names such as “razzmatazz” were more likely to be chosen than names such as “lemon yellow.”

Research has shown that **93% of shoppers will look at the visual appearance** of a company’s logo, website, brochures, or catalogs and then decide whether or not to make a purchase. How the colour is perceived by a customer, the neuronal structure corresponding to the concept of redness is connected to light-sensitive cells in the eyes that are sensitive to the red range of the spectrum. What is perceived through eyes, is electromagnetic radiation at specific wavelengths. Neuronal structure is “learned” by various combinations of integrated signals – for example, a combination of the sky with signals derived from “blue” receptors of the eye. Therefore, blue defines all the blue objects in our neuronal network, and they define blue. Through the course of our life we experience different sets of events with colorful objects. That makes our associations unique and, as a result, each of us understands the concept of blue slightly differently.

Disagreements in the perception of colors depends on origin, age, gender, and even state of health. Vivid and bright colors are popular amongst the youth, while older people feel more comfortable when surrounded by subdued shades. Black is widely known as the color of mourning in Poland. In India, that would be white. It is not an exaggeration to say that color is the key factor in building a mood. It can stimulate our imagination to express taste, smell, and emotions. Since technology has changed it all, and never before has there been so many colors available, the ability to shape our mood with color is particularly true for a computer screen.

The Colour as a powerful marketing tool;

Color is powerful because it can change consumer's mood – the mood of potential customers. If a website improves state of mind, the relationship with a brand will deepen and the probability of a return will increase. Advertisers and designers are well aware of that. Successful brands like Harley Davidson don't sell motorcycles, they sell a lifestyle. Finding the right choice of colors is an art because everyone interprets colors differently. Therefore, the trick is about an entire selection. No color scheme is ideal or universal. There is no best palette for a specific social or cultural group. Colorful information affects the decision-making process with a surprising effectiveness.

The different kinds of colors

Through colors we can control reactions of an audience and provoke them to certain behaviours. The following paragraphs present commonly used colors and describe their impact on users.

Warm bright colors



Beige, yellow, orange, pink, red and similar. These are active, eye-catching colors with a friendly nature that may induce a sense of courage and energy. Warm bright colors visually enlarge objects and make them seem closer.

Cold bright colors



Lavender, silver, azure add subtlety, full of aesthetics and freshness, accents. Such cold but bright tones enhance a sensation of modernity and professionalism if harmoniously combined with gray. It's a nice composition for businesses, commerce, and service websites especially with health, cosmetic and medicine products.

Cold dark colors



Violet, blue, turquoise, green, navy give a feeling of stability and quality. These shades are often placed as accompanying colors. Although they don't attract attention they emphasize the content. Cold dark colors are widely used on business websites for ambitious and hardworking qualities with a special highlight for government, science, automotive and computer products.

Warm dark colors



Gold, purple, brown express classics, tradition, luxury and relaxation. They blend well in expensive and elegant designs for young and rich. Mixed with cold colors give an impression of modernity and novelty. Perfect for brands engaged in finance, consulting, architectonics and craft.

Neutral colors



White, grey and black help to create contrasts and bring all the other colors out. They don't convey any particular message on their own. Neutrals are here to support their neighbours by playing the role of complementation on websites. Their use can be truly universal as they work well in a variety of applications. Black can be combined with bright colors and white with dark colors, making a classic, almost universal combination.

Findings and Conclusions:

The psychological impact of colour: **Blue** denotes loyalty, sincerity, and trustworthiness as well as "calmness and serenity," perhaps explaining why it is widely used both by major corporate or even national brands such as Facebook or the United States. Conversely, the online

weight loss community **Yellow** conveys warning (traffic signals, warning signs, and wet floor signage), or it can suggest happiness and fun. **Green** is the colour of the outdoors and the environment (it symbolises nature and is eco-friendly), and is also relaxing. Using the term “green” and the colour itself gives an environmental ambience to a website such as Friends of the Earth or Greenpeace, and clearly improves the reputation of such a company with environmental concerns. **Black** adds an air of value and luxury or “elegance, sophistication, power,” according to the women’s health website Lifescript. **White** is often left out of colour psychology and there is debate as to whether or not it is classed as a colour – but the extensive use of white space “is a powerful design feature” – and an ever-more prominent feature of contemporary design in websites, print materials, and even products. What impact do the above and other colours have on the consumer? Research from Emerald Group Publishing finds that it takes only 90 seconds for a customer to form their initial impression about a product. A surprising percentage of that assessment – up to 90% in some cases – is based on colour, so the “prudent use of colours can contribute not only to differentiating products from competitors, but also to influencing moods and feelings – positively or negatively – and therefore, to attitude towards certain products.” In a journal article on the impact of colour in marketing, the University of Winnipeg’s Satyendra Singh adds: “The wrong colour choice can have negative impact on the image of the product and the company. Global managers need to recognise that the different meanings associated with specific colours may facilitate multi-segment marketing opportunities.

References:

1. Abramov, I., & Gordon, J. (1994). Color appearance: On seeing red-or yellow, or green, or blue. *Annual Review of Psychology*, 45, 451-485.
2. Ainsworth, R.A., Simpso, L., & Cassell, D. (1993). Effects of three colors in an office interior on mood and performance. *Perceptual and Motor Skills*, 76, 235-241.
3. Alberts, W., & van der Geest, T.M. (2011). Color matters: Color as trustworthiness cue in web sites. *Technical Communications*, 58, 149-60.
4. Attrill, M.J., Gresty, K.A., Russell, A. Hill, R.A., & Barton, R.A. (2008). Red shirt colour is associated with long-term team success in English football. *Journal of Sports Sciences*, 26, 577-582.

5. Beall, A.T., & Tracy, J.L. (2013). Women more likely to wear red or pink at peak fertility. *Psychological Science*, 24, 1837-1841. Berns, R.S., (2001). *Principles of Color Technology*. Wiley, New York.
6. Boynton, R. M. (1988). Color vision. *Annual Review of Psychology*, 39, 69-100.
7. Camgoz, N., Yener, C., & Guvenc, D. (2003). Effects of hue, saturation, and brightness: Part 2. *Color Research & Applications*, 29, 20-28.
8. Andrade, Eduardo (2005), —Behavioral Consequences of Affect: Combining Evaluative and Regulatory Mechanisms,|| *Journal of Consumer Research*, 32 (December), 355-62.
9. Dan Ariely (2009), "The Enduring Impact of Transient Emotions on Decision Making," *Organizational Behavior and Human Decision Processes*, 109 (1), 1-8.
10. Belk, Russell W. (1988), —Possessions and the Extended Self,|| *Journal of Consumer Research*, 15(2), 139-168.
11. Biswas, Rahul, Daniel Riffe & Dolf Zillman (1994) —Mood Influence on the appeal of bad news,|| *Journalism Quarterly*, 71, 689-696.
12. Bornstein, Robert F. and Paul R. D'Agostino (1992), —Stimulus Recognition and the Mere Exposure Effect,|| *Journal of Personality and Social Psychology*, 63(4), 545-52.
13. Boyatzis, Chris J. and Reenu Varghese (1994), "Children's Emotional Associations with Colors," *Journal of Genetic Psychology*, 155 (1), 77-85. Brown, Laura (2011, February 14), *Hillary Clinton: Myth and*
14. Joel B. and Eduardo B. Andrade (2004), —Affective Intuition and Task-Contingent Affect Regulation,|| *Journal of Consumer Research*, 31(September), 358-367.
15. D'Andrade, Roy and Michael Egan (1974), "The Colors of Emotion," *American Ethnologist*, 1, 49-63.
16. Gibbons, Frederick X. (1986), "Social Comparison and Depression: Company's Effect on Misery," *Journal of Personality and Social Psychology*, 51 (1), 140-48. 34
17. Gibson, Rhonda, Charles F. Aust, and Dolf Zillmann (2000), "Loneliness of Adolescents and Their Choice and Enjoyment of Love-Celebrating Versus Love-Lamenting Popular Music," *Empirical Studies of the Arts*, 18 (1), 43-48.
18. Gorn, Gerald J., Amitava Chattopadhyay, Tracey Yi, and Darren W. Dahl (1997), "Effects of Color as an Executional Cue in Advertising: They're in the Shade," *Management Science*, 43 (10), 1387-400. Gross, James J. (1998), "Antecedent-and Response-Focused

Emotion Regulation: Divergent Consequences for Experience, Expression, and Physiology," *Journal of Personality and Social Psychology*, 74 (1), 224-37.

19. Hart, William, Dolores Albarracin, Alice H. Eagly, Inge Brechan, Matthew J. Lindberg, and Lisa Merrill (2009), —Feeling Validated Versus Being Correct: A Meta-Analysis of Selective Exposure to Information, *Psychological Bulletin*, 135 (4) 555-88.
20. Heine, Steven J., Travis Proulx, and Kathleen D. Vohs (2006), —The Meaning Maintenance Model: On the Coherence of Social Motivations, *Personality and Social Psychology Review*, 10(2), 88-110.
21. Aarts, H., & Dijksterhuis, A. (2003). The silence of the library: Environment, situational norm, and social behavior. *Journal of Personality and Social Psychology*, 84, 18 –28.
22. Ainsworth, R. A., Simpson, L., & Cassell, D. (1993). Effects of three colors in an office interior on mood and performance. *Perceptual and Motor Skills*, 76, 235–241.
23. Amthauer, R., Brocke, B., Liepmann, D., & Beauducel, A. (1999). *Intelligenz-Struktur-Test Intelligence Structure Test*. Göttingen, Germany: Hogrefe.
24. Atkinson, J. W. (1957). Motivational determinants of risk-taking behavior. *Psychological Review*, 64, 359 –372.
25. Atkinson, J. W., & Litwin, G. H. (1960). Achievement motive and test anxiety conceived as motive to approach success and motive to avoid failure. *Journal of Abnormal and Social Psychology*, 60, 52– 64.
26. Baldwin, M. W., & Meunier, J. (1999). The cued activation of attachment relational schemas. *Social Cognition*, 17, 209 –227.
27. Bargh, J. A. (1990). Auto-motives: Preconscious determinants of social interaction. In E. T. Higgins & R. Sorrentino (Eds.), *Handbook of motivation and cognition* (Vol. 2, pp. 93–130). New York: Guilford Press.
28. Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist*, 54, 462– 479.
29. Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A. Y., Barndollar, K., & Trötschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology*, 81, 1014 –1027.
30. Baumeister, R. F., Bratslavsky, E., Finkenaur, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5, 323–370.

31. Bellizzi, J. A., & Hite, R. E. (1992). Environmental color, consumer feelings, and purchase likelihood. *Psychology & Marketing*, 9, 347–363.
32. Birney, R. C., Burdick, H., & Teevan, R. C. (1969). *Fear of failure*. New York: Van Nostrand Reinhold. 166 ELLIOT, MAIER, MOLLER, FRIEDMAN, AND MEINHARDT
33. Buss, A. H. (1994). *Personality: Temperament, social behavior, and the self*.
34. Needham Heights, MA: Allyn & Bacon. Byrne, M., & Hilbert, D. R. (2003). Color realism and color science: Evolution and animal color vision. *Behavioral and Brain Sciences*, 26, 791–794.
35. Cacioppo, J. T., Gardner, W. L., & Berntson, G. G. (1997). Beyond bipolar conceptualizations and measures: The case of attitudes and evaluative space. *Personality and Social Psychology Review*, 1, 3–25.
36. Cacioppo, J. T., Gardner, W. L., & Berntson, G. G. (1999). The affect system has parallel and integrative processing components: Form follows function. *Journal of Personality and Social Psychology*, 76, 839 – 855.
37. Camgoz, N., Yener, C., & Guvenc, D. (2003). Effects of hue, saturation, and brightness: Part 2. *Color Research and Application*, 29, 20 –28.
38. Ceranski, D. S., Teevan, R., & Kalle, R. J. (1979). A comparison of three measures of the motivation to avoid failure: Hostile press, test anxiety, and resultant achievement motivation. *Motivation and Emotion*, 3, 395– 404.
39. Chartrand, T. L., & Bargh, J. A. (1996). Automatic activation of social information processing goals: Nonconscious priming reproduces effects of explicit conscious instructions. *Journal of Personality and Social Psychology*, 71, 464 – 478.
40. Cosmides, L., & Tooby, J. (2000). Evolutionary psychology and the emotions. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 91–115). New York: Guilford Press.
41. Costa, P. T., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, 81, 322–331.
42. Davidson, R. J., Schwartz, G. E., Saron, C., Bennett, J., & Goleman, D. J. (1979). Frontal versus parietal EEG asymmetry during positive and negative affect. *Psychophysiology*, 16, 202–203.

43. Dijksterhuis, A., Chartrand, T. L., & Aarts, H. (in press). Automatic behavior. In J. Bargh (Ed.), *Automatic processes in social thinking*. Philadelphia: Psychology Press.
44. Durrant, R., & Ellis, B. J. (2003). Evolutionary psychology. In M. Gallagher & R. Nelson (Eds.), *Handbook of psychology: Biological psychology* (pp. 1–33). Hoboken, NJ: Wiley.
45. Elliot, A. J. (2005). A conceptual history of the achievement goal construct. In A. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 52–72). New York: Guilford Press.
47. Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology*, 70, 461–475.
48. Elliot, A. J., & McGregor, H. A. (1999). Test anxiety and the hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, 76, 628 – 644.
49. Elliot, A. J., & McGregor, H. A. (2001). A 2 x 2 achievement goal framework. *Journal of Personality and Social Psychology*, 80, 501–519.
50. Elliot, A. J., & Reis, H. T. (2003). Attachment and exploration in adulthood. *Journal of Personality and Social Psychology*, 85, 317–331.
51. Elliot, A. J., Shell, M. M., Henry, K. B., & Maier, M. (2005). Achievement goals, performance contingencies, and performance attainment: An experimental test. *Journal of Educational Psychology*, 97, 630 – 640.
52. Fairchild, M. D. (2005). *Color appearance models* (2nd ed.). New York: Wiley. Fehrman, K. R., & Fehrman, C. (2004). *Color: The secret influence* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
53. G. M., & Bargh, J. A. (2003). Thinking of you: Nonconscious pursuit of interpersonal goals associated with relationship partners. *Journal of Personality and Social Psychology*, 84, 148 –164.
54. Gilhooly, K. J. (1978). Bigram statistics for 205 five-letter words having single-solution anagrams. *Behavior Research Methods and Instrumentation*, 10, 389 –392.

55. Gilliam, G. E. (1991). The effects of Baker-Miller pink on physiological and cognitive behavior of emotionally disturbed and regular education students. *Behavioral Disorders*, 17, 47–55.
56. Gilliam, G. E., & Unruh, D. (1988). The effects of Baker-Miller pink on biological, physical and cognitive behaviors. *Journal of Orthomolecular Medicine*, 5, 202–206.
57. Goldstein, K. (1942). Some experimental observations concerning the influence of colors on the function of the organism. *Occupational Therapy and Rehabilitation*, 21, 147–151.
58. Goodfellow, R. A., & Smith, P. C. (1973). Effects of environmental color on two psychomotor tasks. *Perceptual and Motor Skills*, 37, 296–298.
59. Green, W. K., Hasson, S. M., Mohammed, S. K., Phillips, C. L., Richards, P. E., Smith, M. E., & White, A. (1982). Effect of viewing selected colors on the performance of gross and fine motor tasks. *Perceptual and Motor Skills*, 54, 778.
60. Guilford, T., & Rowe, C. (1996, August 22). Unpalatable evolutionary principles. *Nature*, 382, 667–668.
61. Hammes, J. A., & Wiggins, S. L. (1962). Perceptual–motor steadiness, manifest anxiety, and color illumination. *Perceptual and Motor Skills*, 14, 59–61.
62. Harmon-Jones, E., & Sigelman, J. (2001). State anger and prefrontal brain activity: Evidence that insult-related relative left-prefrontal activation is associated with experienced anger and aggression. *Journal of Personality and Social Psychology*, 80, 797–803.
63. Hatta, T., Yoshida, H., Kawakami, A., & Okamoto, M. (2002). Color of computer display frame in work performance, mood, and physiological response. *Perceptual and Motor Skills*, 94, 39–46.
64. Heckhausen, H., Schmalt, H., & Schneider, K. (1985). *Achievement motivation in perspective* (M. Woodruff & R. Wicklund, Trans.). New York: Academic Press.
65. Hill, R. A., & Barton, R. A. (2005, May 19). Red enhances human performance in contests. *Nature*, 435, 293.
66. Hutchings, J. (1997). Color in plants, animals, and man. In K. Nassau (Ed.), *Color for science, art, and technology* (pp. 222–246). Amsterdam: Elsevier.
67. Ingram, F., & Lieberman, L. R. (1985). Effects of expectations on the performance of hand grip after viewing selected hues. *Perceptual and Motor Skills*, 61, 370.

67. Inzlicht, M., & Ben-Zeev, T. (2003). Do high-achieving female students underperform in private? The implications of threatening environments on intellectual processing. *Journal of Educational Psychology*, 95, 796 – 805.
68. Isaacs, L. D. (1980). Effects of ball size, ball color, and preferred color on catching by young children. *Perceptual and Motor Skills*, 51, 583–586.
69. Jacobs, G. H. (1981). *Comparative color vision*. New York: Academic Press.
- James, W. T., & Domingos, W. R. (1953). The effect of color shock on motor performance and tremor. *The Journal of General Psychology*, 48, 187–193.
70. Jencks, C., & Phillips, D. (1998). *The Black–White test score gap*. Washington, DC: Brookings Institution Press.
71. Kaiser, P. K. (1984). Psychological response to color: A cultural review. *Color Research and Application*, 9, 29 –36.
- Kaya, N., & Epps, H. H. (2004).
72. Relationship between color and emotion: A study of college students. *College Student Journal*, 38, 396 – 405.
73. Krieg, J. S. (1932). The hypothalamus of the albino rat. *Journal of Comparative Neurology*, 55, 19 – 89.
74. Kwallek, N., & Lewis, C. M. (1990). Effects of environmental color on males and females: A red or white or green office. *Applied Ergonomics*, 21, 275–278.
75. Kwallek, N., Lewis, C. M., Lin-Hsiao, J. W., & Woodson, H. (1996). Effects of nine monochromatic office interior colors on clerical tasks and worker mood. *Color Research and Application*, 21, 448 – 458.
76. Kwallek, N., Lewis, C. M., & Robbins, A. S. (1988). Effects of office interior color on workers' mood and productivity. *Perceptual and Motor Skills*, 66, 123–128.
- EFFECT OF RED
167 Kwallek, N., Woodson, H.,
77. Lewis, C. M., & Sales, C. (1997). Impact of three interior color schemes on worker mood and performance relative to individual environmental sensitivity. *Color Research and Application*, 22, 121–132.
78. Lang, P. J., Davis, M., & Ohman, A. (2000). Fear and anxiety: Animal models and human cognitive psychophysiology. *Journal of Affective Disorders*, 61, 137–159.
79. Levy, I. B. (1984). Research into the psychological meaning of color. *American Journal of Art Therapy*, 23, 58 – 62.

80. Mahnke, F. H. (1996). *Color, environment, and human response*. New York: Van Nostrand Reinhold.
81. Matthews, G. (1985). The effects of extraversion and arousal on intelligence test performance. *British Journal of Psychology*, 76, 479 – 493.
82. McClelland, D. C. (1985). *Human motivation*. Cambridge, England: Cambridge University Press.
83. Mollon, J. D. (1989). “Tho’ she kneel’d in that place where they grow . . .”: The uses and origins of primate colour vision. *Journal of Experimental Biology*, 146, 21–38.
84. Moskowitz, G. B., Li, P., & Kirk, E. R. (2004). The implicit volition model: On the preconscious regulation of temporarily adopted goals. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 317– 414). San Diego, CA: Academic Press.
85. Nakashian, J. S. (1964). The effects of red and green surroundings on behavior. *The Journal of General Psychology*, 70, 143–162.
86. Neiss, R. (1988). Reconceptualizing arousal: Psychobiological states in motor performance. *Psychological Bulletin*, 103, 345–366.
87. Ott, J. W. (1979). The dual function of the eyes. *Southern Journal of Optometry*, 21, 8 – 13.
88. Pellegrini, R. J., & Schauss, A. G. (1980). Leg strength as a function of exposure to visual stimuli of different hues: An experimental test of the kinesoid hypothesis. *Journal of Orthomolecular Psychiatry*, 9, 144 –147.
89. Pellegrini, R. J., Schauss, A. G., & Birk, T. J. (1980). Leg strength as a function of exposure to visual stimuli of different hues. *Bulletin of the Psychonomic Society*, 16, 111–112.
90. Pellegrini, R. J., Schauss, A. G., Kerr, T. J., & Ah You, B. (1981). Grip strength and exposure to hue differences in visual stimuli: Is postural status a factor? *Bulletin of the Psychonomic Society*, 17, 27–28.
91. Pierce, D. H., & Weinland, J. D. (1934). The effect of color on workmen. *Personnel Journal*, 13, 34 –38.
92. Pratto, F., & John, O. P. (1991). Automatic vigilance: The attentiongrabbing power of negative social information. *Journal of Personality and Social Psychology*, 61, 380 –391.
92. Pressey, S. L. (1921). The influence of color upon mental and motor efficiency. *American Journal of Psychology*, 32, 327–356.

93. Profusek, P. J., & Rainey, D. W. (1987). Effects of Baker-Miller pink and red on state anxiety, grip strength, and motor precision. *Perceptual and Motor Skills*, 65, 941–942.
94. Pryke, S. R., Andersson, S., Lawes, M. J., & Piper, S. E. (2001). Carotenoid status signaling in captive and wild red-collared widowbirds: Independent effects of badge size and color. *Behavioral Ecology*, 13, 622– 631.
95. Rosenstein, L. D. (1985). Effect of color of the environment on task performance and mood of males and females with high or low scores on the Scholastic Aptitude Test. *Perceptual and Motor Skills*, 60, 550.
96. Rothblum, E. D. (1990). Fear of failure: The psychodynamic, need achievement, fear of success, and procrastination models. In H. Leitenberg (Ed.), *Handbook of social and evaluation anxiety* (pp. 497–537). New York: Plenum Press.
97. Seibt, B., & Förster, J. (2004). Stereotype threat and performance: How self-stereotypes influence processing by inducing regulatory foci. *Journal of Personality and Social Psychology*, 87, 38–56.
98. Setchell, J. M., & Wickings, E. J. (2005). Dominance, status signals, and coloration in male mandrills (*Mandrillus sphinx*). *Ethology*, 111, 25–50.
99. Shah, J. Y. (2003). Automatic for the people: How representations of others may automatically affect goal pursuit. *Journal of Personality and Social Psychology*, 84, 661– 681.
100. Shick, J. (1975). Effect of target color on throwing accuracy. *The Research Quarterly*, 46, 389–390.
101. Sinclair, R. C., Soldat, A. S., & Mark, M. M. (1998). Affective cues and processing strategy: Color-coded examination forms influence performance. *Teaching of Psychology*, 25, 130–132.
102. Smith, J. M., Bell, P. A., & Fusco, M. E. (1987). The influence of color and demand characteristics on muscle strength and affective ratings of the environment. *The Journal of General Psychology*, 113, 289–297.
103. Soldat, A. S., Sinclair, R. C., & Mark, M. M. (1997). Color as an environmental processing cue: External affective cues can directly affect processing strategy without affecting mood.

104. Social Cognition, 15, 55– 71. Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, 69, 797– 811.
105. Stokes, M., Fairchild, M. D., & Berns, R. S. (1992). Precision requirements for digital color reproduction. *ACM Transactions on Graphics*, 11, 406 – 422.
106. Stone, N. J. (1998). Windows and environmental cues on performance and mood. *Environment and Behavior*, 30, 306 –321.
107. Stone, N. J. (2001). Designing effective study environments. *Journal of Environmental Psychology*, 21, 179 –190.
108. Stone, N. J., & English, A. J. (1998). Task type, posters, and workspace color on mood, satisfaction, and performance. *Journal of Environmental Psychology*, 18, 175–185.
109. Strube, M. J., & Roemmele, L. A. (1985). Self-enhancement, selfassessment, and self-evaluative task choice. *Journal of Personality and Social Psychology*, 49, 981–993.
110. Thayer, R. E. (1986). Activation–Deactivation Adjective Check List: Current overview and structural analysis. *Psychological Reports*, 58, 607– 614. Valdez, P., & Mehrabian, A. (1994). Effects of color on emotions. *Journal of Experimental Psychology: General*, 123, 394 – 409.
111. Watson, D., Clark. L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- 112.** Whitfield, T. W., & Wiltshire, T. J. (1990). Color psychology: A critical review. *Genetic, Social and General Psychology Monographs*, 116, 387– 412. Wright, A. (1998).