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Author

Shi, Tommy

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THE USE OF COLOR IN MARKETING:

COLORS AND THEIR PHYSIOLOGICAL AND PSYCHOLOGICAL IMPLICATIONS

TOMMY SHI

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Whenever you see the combination of the colors red and yellow together, what does that remind you of? Do you happen to have a sudden pang of hunger? Perhaps you've also developed an urge to satiate it with hamburgers and fries. From the mention of a red and yellow pattern, it is highly likely that you may have thought of the popular fast food chain McDonald's, whose bright golden arches and red restaurant roofs are easily noticeable and quite distinct. Though characterizing color as a hunger-inducer may be quite a stretch, color has been found to affect cognition and mood, which in turn influences consumer decision-making. Color is a highly significant aspect in the marketing field because a large amount of transactions are made in environments where color can be a background aspect (in a store), or a foreground trait (in a product). Thus, due to its ubiquity in the market, it is a factor that holds much influence on the decisions and attitudes of consumers.

Color has a diversity of uses. It is vital in brand recognition, as is the case in the McDonald's example presented earlier. It is also an essential tool in drawing attention to a product, which is applicable to the bright red and yellow in McDonald's signature logo. Color can also influence mood or an attitude towards a product and create a certain image for a product. In the market for produce, color is often used as a direct or indirect estimate of quality. Fruits and vegetables with brighter colors are regarded as fresher,

and consequently more appealing. A mathematical relationship has even been established between the grade of a tomato and its color, which is fondly regarded as the Tomato Colorimeter (Francis, 1995). How color is able influence consumers' decisions may be explained most fully from a biological as well as a psychological perspective. Because our perception

“The results of this study suggest that color can have customer drawing power as well as image-creating potential in retail store design.” Bellizzi, Crowley,

Hasty

“...regardless of color preference, subjects may be physically drawn to warm colors, but feel that warm-color environments are generally unpleasant.”

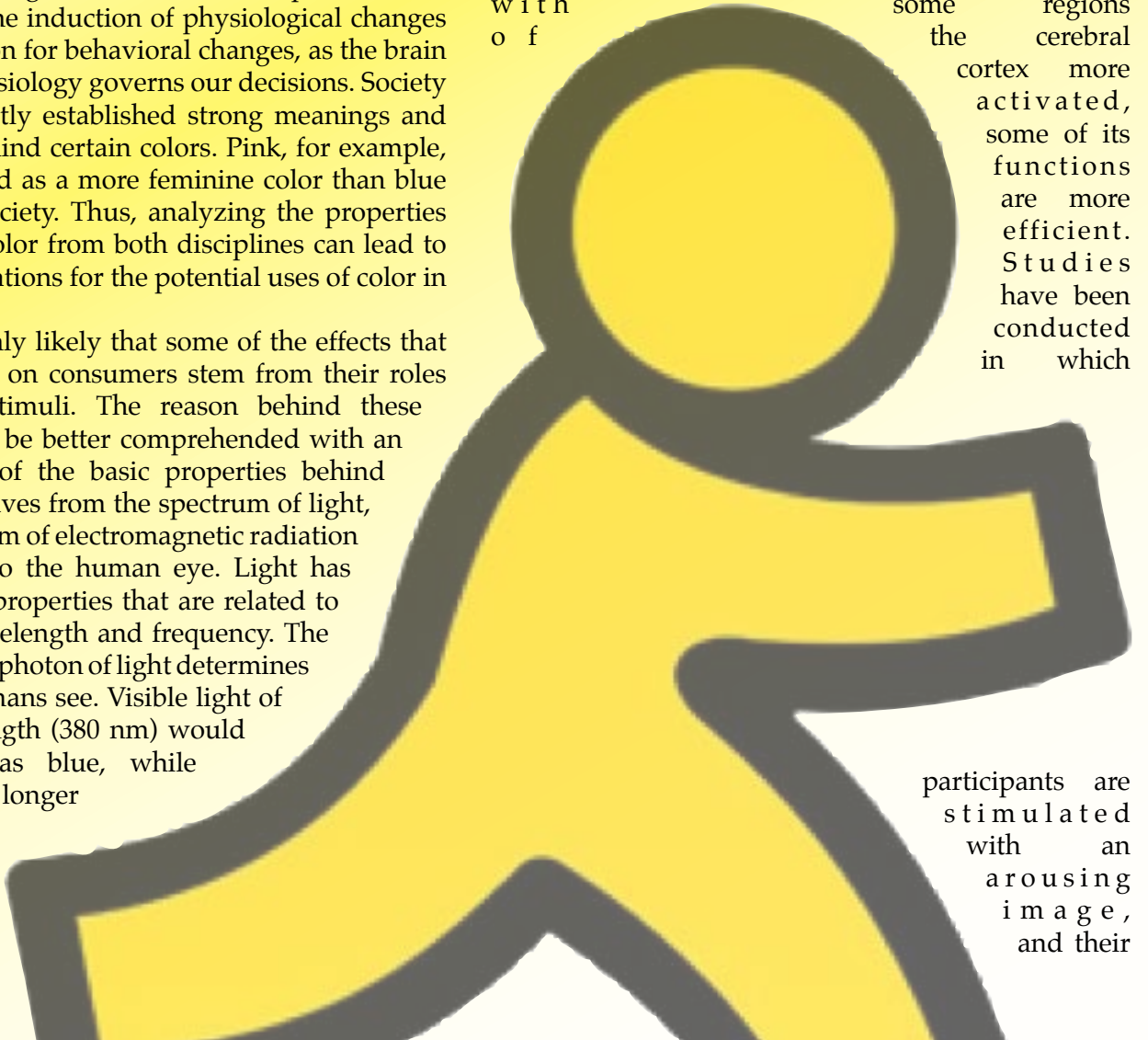
of colors is actually based on photons of light and energy, they may induce biological changes. On a broader level, this energy can serve as stimuli and incite certain biological functions and responses in the human body. The induction of physiological changes is a partial reason for behavioral changes, as the brain and human physiology governs our decisions. Society has also implicitly established strong meanings and associations behind certain colors. Pink, for example, may be regarded as a more feminine color than blue in a Western society. Thus, analyzing the properties and effects of color from both disciplines can lead to valuable implications for the potential uses of color in marketing.

It is highly likely that some of the effects that colors can have on consumers stem from their roles as biological stimuli. The reason behind these distinctions can be better comprehended with an understanding of the basic properties behind color. Color derives from the spectrum of light, and light is a form of electromagnetic radiation that is visible to the human eye. Light has two important properties that are related to each other: wavelength and frequency. The wavelength of a photon of light determines what we as humans see. Visible light of a short wavelength (380 nm) would be perceived as blue, while visible light of a longer wavelength (740 nm) would be perceived as red. Due to the relationship

between wavelength and frequency, a shorter wavelength implies a higher frequency, which means that the energy of a photon of light is dependent on those factors. The varying energies of each type of color may influence us biologically through a role as a stimulus.

Hence, taking into mind the fact that colors can be used as a stimulating device, there has been much research exploring exactly how color can stimulate consumers. One supported idea is that the light can increase arousal, which in turn enhances the processing of any given information. The reticular activating system, which is a system of several neuronal circuits connecting the brainstem and the cortex, is the structure responsible for regulating arousal. External stimuli, such as certain colors, can activate the reticular activating system (RAS). The RAS is highly linked to other regions in the cerebral cortex of the brain, which plays a central role in memory, attention, perception, and thought. Activation of the RAS can lead to increased activity in certain areas of the cerebral cortex. Consequently,

with some regions of the cerebral cortex more activated, some of its functions are more efficient. Studies have been conducted in which



participants are stimulated with an arousing image, and their

physiological responses are measured. The methods used to gauge arousal often involve measuring blood circulation, respiration, energy expenditure, electrophysiological responses, and biochemical in the subject. This idea of physiological arousal is vital to the success of an advertisement. If an advertisement is able to increase a consumer's level of activation, the consumer will more likely process the information in the advertisement, regardless of whether or not they may be persuaded by it (Kroeber-Riel, 1979). While it is possible to use other factors, such as imagery or text, to activate the reticular activating systems in consumers, neither is as quick or easy at increasing natural arousal as colors, which require no reading or fixed attention. Thus, marketers always try to utilize colors they believe to be activating, as it will allow for maximal processing of the content of their advertisements. Aside from enabling more efficient processing of information, arousal can also enhance the storage of information. As mentioned earlier, the reticular activating system is linked to the cerebral cortex, in which memory is also a function. This implies that arousal may enhance long-term memory, short-term memory, or both. A study on the effectiveness of television commercials obtained results that support this idea. Commercials that were embedded in more arousing television programs were found to lead to better memory and recall, and also information processing. The participants were found to remember the content and some details of the advertisement relatively better. Though the results of this study were applicable specifically to the medium of television, it is likely that the same concept would apply to advertisements in general—including print, digital, and in television forms (Singh and Churchill, 1987). Components of an advertisement upon which a person focuses on more frequently are recalled better (Bernhard, 1978). The use of colors as a tool that could potentially induce long-term storage of the advertisement information is invaluable, as recall of the advertisement could lead to recollection of the product, which would deem

the marketing campaign successful. Remembrance of the product could also lead to brand loyalty and continued publicity via word-of-mouth.

With the potential applications of color established above, one may wonder how specific color selections would maximize the effectiveness of advertisements. One posited idea is a U-shaped relationship between the wavelength of light (which determines color) and arousal, in which the more extreme wavelengths (light in the visible spectrum of the shortest wavelengths and the longest wavelengths, which are blue and red, respectively) lead to greater arousal (Wilson, 1966). From his experiments, Wilson found red to be much more physiologically arousing than green, based on skin conductance measures and conductance change. The study focused on the effects of red and green, based on the idea that green was in the middle of the visible spectrum and would not have as great an effect as red, which is on the extreme end of the visible spectrum of light.

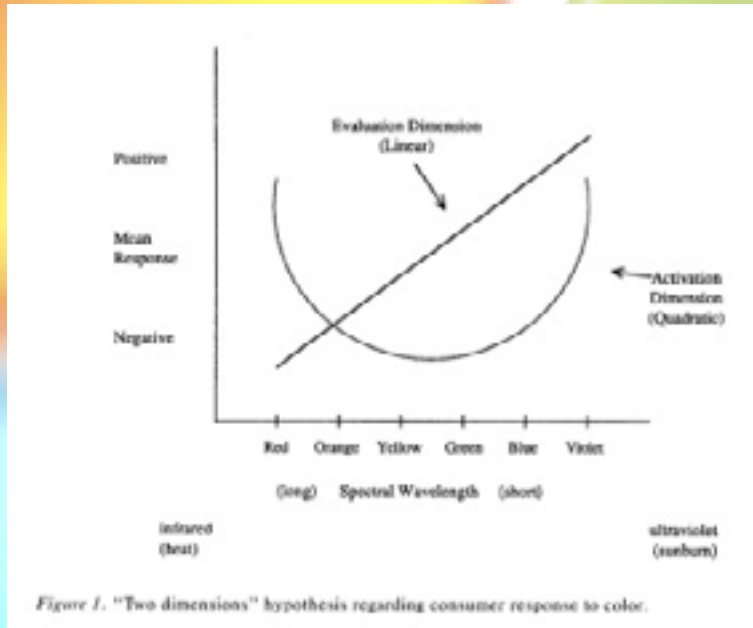


Figure 1. "Two dimensions" hypothesis regarding consumer response to color.

Based on the results of this study, utilizing the color red in advertisements and products could potentially maximize marketing efficiency.

In order to increase purchases of a particular product, it is logical that a marketer would want a consumer to develop a positive and favorable attitude towards the product. From the psychological standpoint, colors may also be used to develop a peripheral or subconscious attitude toward a product. Thus the evaluative appeal of colors is a highly significant factor that must be considered when deciding on what colors to use for an advertisement. Besides eliciting an automatic and natural biological and neurobiological response, colors can also elicit certain feelings and moods. Establishing conclusions on preferences for certain colors is definitely a difficult task, as every individual may widely differ in their associations of different colors and what each color may mean to him or her. However, society has already established strong associations with most colors that the general consensus may either already agree with

or accept. For example, the color gold is often linked to success, achievement, and luxury, and implies wealth and extravagance. Such associations have an important effect on what a consumer thinks of a product and whether or not the consumer will want to buy it. Research on color preference has occasionally dichotomized colors into a warm group (red, orange, yellow), and a cool group (green, blue, violet). Multiple studies have shown that cool colors are consistently preferred over warm colors (Silver and McCulley, 1988). The reasoning behind this may lie in the fact that blue is a cooler color and perceived to be more relaxing and pleasant, which would increase the favorability of a product to a buyer. Though gold was previously mentioned to have positive connotations, the color merely establishes a particular image that may or may not appeal to all consumers. It is therefore effective only if the created image is aligned with that of a consumer's intentions for a product. Consequently, it is not a factor that may affect the likelihood of purchases on a general level.

Knowing which colors to utilize in an advertisement is only one part of the question marketers must face. The other part of the question concerns the medium by which the colors are presented. So far the discussion above has maintained an implicit assumption that the colors mentioned are

and Hite (1992) showed that subjects in blue purchasing environments expressed a greater intention to shop, browse, and purchase in the simulated store. In the study, participants were presented with a table of slides in which each slide depicted a different model of a television. They were then asked to "shop" for a television as they would if they were in a store and select a television that they would purchase. The color variable was presented in the backgrounds of the slides, and participants were either assigned to the blue or the red condition. The study found that there were more simulated purchases and fewer postponements to the transactions. The results from a portion of the experiment also suggested that the affective perception of colors rather than the arousal dimension, referring to the arousing properties of color, might be responsible for the outcome. These studies are all highly significant in that the presence of colors in a store or the environment was found to also affect consumer behavior and their decisions. Besides being relevant merely to marketers and advertisers, colors are a factor that storeowners must also acknowledge in order for their businesses to be successful. It is uncertain whether the colors affected the consumers through the arousal dimension (biological changes) or through the evaluative approach (attitudinal and mood changes), or both. Either explanation is possible,

"Color is such a pervasive part of everyday life that one tends to take it for granted. Yet, differential effects (both physiological and psychological) for various colors have been found repeatedly across decades of research in psychology." - Crowley

those utilized specifically in an advertisement or in the packaging of a product. However, another important conduit through which color can influence people is through the store or purchasing environment. The background color of a room can affect feelings about a product, or even impact the mood and behavior of a customer. In an experiment, one study found that respondents presented with a slide of a pen against a blue background exhibited a more positive attitude toward buying the product than those shown the same slide of a pen but against a red background (Middlestadt, 1990). Another experiment by Bellizzi

as arousing colors can induce biochemical changes that are more "pleasing" and lead to more transactions. The color blue for example, may induce physiological changes that include fluctuations in hormone levels or also circulation of neurotransmitters, which govern the feelings of "pleasure" and "happiness."

A store that has arousing colors can also draw more attention. Bellizzi, Crowley, and Hasty (1983) found that subjects were physically drawn to warm colors such as red and yellow. When presented with images of retail displays, subjects viewed red and other warm colors as colorful yet negative, and high

on arousal. Blue and the other cooler colors were rated as positive, relaxed, and favorable. The association of certain colors with certain cultural images also explains the influence of color in an environment. Returning to the color gold and its societal associations, a store environment in which gold is a primary could also subliminally or explicitly convince customers to make purchases, as some may feel a strong association to luxury and sophistication.

Choosing the right colors to maximize the effectiveness of an advertisement or to increase purchases of a product or in a store is a difficult task, mainly due to the unpredictability of consumer behavior. The existence of patterns, however, alleviates the uncertainty, leading to potential success. From experimental findings, it can be confidently believed that red is more arousing than a color in the middle of the visible spectrum, like green. Wilson (1966) was able to establish this through measures of electrodermal responses and galvanic skin responses, both of which involve measuring the electrical conductance of the skin that can vary with physiological arousal. The Two Dimensions hypothesis, which suggests that there is an evaluative dimension as well as an arousal dimension dependent on the wavelength of light, or color, ties together the two possible bases for the influence of color. For the arousal dimension, the relationship is U-shaped, with more arousal elicited on the extremes of the wavelength spectra. With regards to the evaluative dimension, the relationship is positively linear, in which the longer wavelengths are more negatively perceived relative to the shorter wavelengths (Crowley, 1993). Other factors that may affect the effectiveness of color in advertisements or store environments may be the hue and saturation of color. Such features of a color include how bright the color is, how concentrated or "solid," and even any variances of a color. The color blue, for example, has the variants teal and turquoise. One study has found that higher levels of chroma in a color elicited more excitement and subsequently led to greater ad likeability (Gorn et al., 1997).

Even when a few colors are found to be favorable in advertisements or retail environments, it is still important to realize that most of the color research mentioned above should only be applied to the United States and possibly the Western culture. Colors do have distinctly different meanings across cultures. Some cultures may view white as a pure, holy and positive color, while others associate it with death and passing. Such consideration of color must be taken into account when entering foreign markets. A cross-cultural perspective is consequently vital in developing global marketing strategies that will be

effective and also noncontroversial (Aslam, 2006). Because marketing is a means of increasing profits or furthering the interests of organizations, it is likely that some research findings are being withheld from public accessibility in order to maintain advertising effectiveness, profitability, and a competitive advantage. Nevertheless, the research conducted so far has yielded invaluable insights into not only consumer behavior, but also human physiological and psychological responses to stimuli. Once more conclusions can be drawn about the arousal or evaluative effects of color, further research should be conducted on the applications of that knowledge into increasing consumer purchases or the success of advertisements. Crowley found that a physiologically activated consumer is more likely to engage in impulse buying (1993). Such a finding, for example, would be highly valuable to the sales of a product that is intended to be purchased with less consideration—like a bag of chips as opposed to a television. Such findings can even be generalized outside of the field of marketing, to publicity, non-profit marketing, or even the public sector, such as the use of red in stop signs. Depending on the goal of the advertisement, product, or company, different colors will be used. Despite all the research on the determination of the ideal colors to use in marketing, it is still important to note that just because there has been strong support for the use of blue in a purchasing environment, it does not suggest that storeowners should repaint the walls of their entire store blue. The research regarding this field has pointed out clearly that color is a highly significant factor that must be considered when designing the packaging of a product, the product itself, and the environment in which products are sold.

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