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Unanticipated Marketing Effects of Color: Empirical Tests in Two Contexts

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In two empirical studies, we test the effects of colors perception on marketing phenomena. In two studies, we show that (a) colors (warm vs. cold) interact with the message appeal (heartwarming vs. heartbreaking), and (b) colors, by triggering different emotional reactions to the stimuli, influence consumer behavior by impacting risk-tolerance.

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Extended Abstract

Marketers use colors extensively for a variety of reasons, from attempting to induce positive product attitudes and beliefs(Middlestadt 1990) to making customers linger longer in malls and have a more positive shopping experience (Bellizzi and Hite 1992).

Interestingly, humans perceive colors as cold (e.g., blue) and warm (e.g., red, orange) regardless of actual temperature (Stone 1998). [Note: A color consists of hue determined by its wavelength, chroma, and value, only hue is commonly used to describe a color]. And, cold colors tend to have shorter wavelengths compared to warm colors (Yildirim et al. 2007). Research shows that people feel more comfortable if they stay in cold-colored environments when feeling hot and warm-colored environments when feeling cold (Kearney 1966). Blue-colored workplaces tend to feel colder than warm-colored ones (Stone 1998). It is surmised that different temperature perceptions of color occur due to associative learning by associating the colors red and orange with objects such as fire and the sun, and associating the color blue with objects such as a deep sea and ice.

Furthermore, colors also influence emotional responses to the stimuli. For instance, warm colors are perceived as arousing and exciting, while cold colors as relaxing and calming (Bellizzi et al. 1983, 1992; Crowley 1993; Gorn et al. 2004; Valdez and Mehrabian 1994; Dijkstra et al. 2008).

Surprisingly, to date no one has investigated the effect of these inherent qualities of color (warm/cold; arousing/calming) on marketing communications and on consumer choice behavior. In two studies, we demonstrate that the type of color used affects the effectiveness of persuasive messages as well as the degree of risk-taking behavior. More specifically, we show how the type of color used in designing a message interacts with the type of message appeal to determine its effectiveness and how the type of color used for a stimuli background affects risk-taking behavior in terms of a positive and a negative event.

Color and Message Effectiveness of a Charitable Appeal

Charitable appeals can be broadly classified as either heartwarming, depicting hope, or heartbreaking, depicting desperation and misery (Bendapudi, Singh, Bendapudi (1996). We design two types of flyers soliciting help. A pretest showed that the heartwarming flyer aroused emotionally warm feelings of pleasantness and happiness, whereas the heartbreaking flyer aroused emotionally cold feelings of guilt, depression and sadness. Reasoning that it is a natural human tendency to find a warm place when feeling cold and a cool place when feeling warm, we propose that a heartbreaking (heartwarming) message will be more effective when presented in warm (cold) colors.

Using a 2 (message type: heartwarming vs. heartbreaking) x 2 (background color of the flyer: blue vs. orange) between subjects design, we randomly assigned 129 student participants to the various conditions. We measured informativeness, persuasiveness, and intention to donate. The results show an interaction effect of the type of color and the type of message on informativeness ($p<0.01$). The post hoc analysis shows that the heartbreaking (heartwarming) flyer is more informative with orange (blue) background (respectively, $p<0.05$). [Note: In designing stimuli, we control chroma and value but vary the hue]. We also find an interaction effect on persuasiveness ($p<0.05$), such that the heartbreaking flyer with the color orange is more persuasive than that with blue ($p<0.1$), but the heartwarming flyer with blue is not more persuasive than that with orange ($p>0.1$).

The results also show an interaction effect on the intention to donate ($p<0.01$). The post-hoc analysis shows that the heartwarming (heartbreaking) flyer with blue (orange) is more effective in enhancing the intention to donate ($p<0.1$). It appears that the informativeness of the message mediates the interaction between the type of color and the type of message on the intention to donate. A color compatible with the message enhances the informativeness of the message. Although we did not measure it, it appears that the effect is due to greater attention derived to the message processing. The increased informativeness in turn affects the effectiveness of the message. Previous studies have shown that perceived sensory quality enhanced by a suitable atmosphere affects buyer's information and affective state

(Menon and Kahn 2002; Kotler 1973) and enhances consumers' attention, purchase intentions and shopping time (Baker, Grewal, & Levy 1992; Kotler 1973) in an online shopping mall as well as in a traditional store.

Effect of Color on Risk-Taking

We hypothesize that warm colors boost the felt excitement associated with risk-taking behavior in a positive event. Likewise cold colors dampen tension associated with a negative event. We use Hsee and Weber's (1999) stimuli to manipulate risk-taking behavior. In a 2 (background color: blue and orange) x 2 (event type: a lottery prize vs. a traffic fine) design, 86 students were randomly assigned to various conditions. We find the interaction effect between the type of color and the type of event on risk-taking behavior ($p<0.05$). The post-hoc analysis shows that orange, compared to blue, induced more risk-taking in choices ($p<0.05$) in a positive event but that blue, compared to orange, does not significantly increase risk-taking in choices ($p=0.144$) in a negative event. In a follow-up study, we raise the stakes (by increasing the amount of prize and fine) and find that the effect of color on risk-taking behavior vanishes. These results demonstrate that color is likely a peripheral cue, and that its effects are attenuated under high involvement conditions.

These findings have clear implications for managers. Colors, be they in the background of a message or in a store could have profound effects on consumers and we need to take this fact into account in all facets of marketing decisions.

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Empathy Drivers in the Uncanny Valley

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Extended Abstract

For several decades the idea has existed that there exists a state of "almost real" for humanoid figures that causes a strong negative reaction in the viewer (Mori, 1970). First suggested by a Japanese roboticist who had noticed the phenomenon in his daily work, Mori's concept of the "Uncanny Valley" went relatively unstudied for decades after its proposal. The past decade has seen a sudden surge of interest in the behaviors it describes. Robotics researchers have looked at this idea of poor reactions to something that cannot quite pass as real, but the idea has yet to be seriously studied outside their field; furthermore, their focus has been largely on elements of applied practicality to physical designs.

While this lack of research is understandable in decades prior, marketers are now studying consumers who are exposed to unreal figures in their daily lives. These figures range from entirely virtual to actual humans with a veneer of artificiality over them. Films that are entirely created with computer animation software earn hundreds of millions of dollars in the global box office. Photographs of models and celebrities are modified to remove imperfections and improve their proportions to a rigid standard of beauty (Reaves et al., 2004). Web sites use computer-generated avatars to guide users through the site's activities (Holzwarth, Janiszewski, & Neumann, 2006; McGoldrick, Keeling, & Beatty, 2008; Bauer & Neumann, 2005). Some companies choose to pursue the most realistic creations