



# ASSOCIATION FOR CONSUMER RESEARCH

---

Labovitz School of Business & Economics, University of Minnesota Duluth, 11 E. Superior Street, Suite 210, Duluth, MN 55802

## **Blue Or Red? Exploring the Effect of Color on Cognitive Performance**

Ravi P. Mehta, University of British Columbia, Canada

Rui Juliet Zhu, University of British Columbia, Canada

Existing research reports inconsistent findings with regards to the effect of color on performance in cognitive tasks. While some research suggests that cool colors (i.e., blue/green) lead to better performances than warm colors (i.e., red), others record the opposite. We reconcile this discrepancy by demonstrating that different colors can activate alternative regulatory focus and consequently enhance performances on different types of cognitive tasks. Specifically, we show that while red induces a prevention focus and consequently enhances performance on detail-oriented tasks, blue activates a promotion focus and thus enhances performance on creative tasks. Implications for consumer behavior are demonstrated.

### **[to cite]:**

Ravi P. Mehta and Rui Juliet Zhu (2009) , "Blue Or Red? Exploring the Effect of Color on Cognitive Performance", in NA - Advances in Consumer Research Volume 36, eds. Ann L. McGill and Sharon Shavitt, Duluth, MN : Association for Consumer Research, Pages: 1045-1046.

### **[url]:**

<http://www.acrwebsite.org/volumes/14185/volumes/v36/NA-36>

### **[copyright notice]:**

This work is copyrighted by The Association for Consumer Research. For permission to copy or use this work in whole or in part, please contact the Copyright Clearance Center at <http://www.copyright.com/>.

The manipulation check on transportation was successful ( $F=9.301, p<.01$ ). Results showed a main effect for transportation on the number of benefits listed by the participants ( $F=4.805, p<.05$ ). Results also showed a significant interaction between the focal product and transportation on product evaluation ( $F=3.809, p=.05$ ) as well on success prediction ( $F=9.186, p<.01$ ). Comparing contrasts indicated that the product success predictions and product evaluations differed significantly between increased and decreased transported participants in the fruit juice condition (fruit juice: increased transportation>decreased transportation; product evaluation  $t=2.296, p<.05$ , success prediction  $t=3.558, p<.01$ ), but not in the ice cream condition (product evaluation,  $t=-.525$ , NS, success prediction,  $t=-.822$ , NS). Thus, higher levels of transportation on the side of the reader into a scenario did not result in more positive evaluations and success predictions for both products. For the fruit juice, higher levels of transportation resulted more positive product evaluation and success prediction. However, for the ice cream the product evaluations and success predictions were equal for higher and lower levels of transportation on the side of the reader.

This study used a positive and negative product (as pretested). Apparently, either our scenario or our transportation manipulation was not strong enough to reverse the effect of transportation for the ice cream that was pretested as a product with more negative valence. In a next study we will manipulate the valence of the ice cream in the scenario directly (positive vs negative). We will combine this variable with transportation instructions (increased vs decreased) in a between subjects design. We expect to find that transportation increases the perceived negative impression of the ice cream that was showing up in the first study.

### Discussion

With our studies we provide insight in the process of transportation for product evaluations. Our results indicate that for some products transportation will increase evaluation, but for others it does not. Transportation, as opposed to what previous literature suggests, provides diverse evaluations of competing products. In a follow up study we would like to show the mechanism of benefit processing. It could be that with the help of narrative transportation consumers can behave like experts and predict market success successfully through the use of narratives or scenarios.

### References

- Escalas, Jeniffer Edson (2007), "Self-Referencing and Persuasion: Narrative Transportation Versus Analytical Elaboration," *Journal of Consumer Research*, 33 (March), 421-29.
- Green, Melanie C. and Timothy C. Brock (2000), "The Role of Transportation in the Persuasiveness of Public Narratives," *Journal of Personality and Social Psychology*, 79 (November), 701-21.
- Hoeffler, Steve (2003), "Measuring Preferences for Really New Products," *Journal of Marketing Research*, 40 (November), 406-20.

## Blue or Red? Exploring the Effect of Color on Cognitive Task Performances

Ravi P. Mehta, University of British Columbia, Canada  
Rui (Juliet) Zhu, University of British Columbia, Canada<sup>17</sup>

Color is a basic aspect of human perception and has intrigued many researchers to study its impact on cognition and behavior. For example, color has been shown to affect test performance (Soldat et al. 1997) and well being of hospital patients (Verhoeven et al. 2006). Research in marketing has shown that cool colors (e.g., blue) are often associated with more favourable product evaluations, higher purchase intentions, and a stronger inclination to shop (Babin et al. 2003).

While the above findings are intriguing, they often lack rigorous theoretical understanding of why those effects occur. In addition, inconsistent results have been reported in the color literature. For example, conflicting results have been found as to whether warm versus cool colors enhance cognitive task performance. While some researchers have found that cool color (e.g., blue) led to better performance than warm color (e.g., red; Elliot et al. 2007; Soldat et al. 1997), others have observed the opposite (e.g., Hatta et al. 2002; Kwallek and Lewis 1990).

This paper intends to reconcile the above discrepancy and advance theoretical understanding of how and why color affects human cognition. We suggest that different colors can activate alternative types of regulatory focus, and consequently affect performances on different types of cognitive tasks. People also develop shared associations with colors (Elliot et al. 2007). While red is often associated with dangers and mistakes (Elliot et al. 2007), blue is frequently associated with openness and freedom (e.g., sky and ocean; Kaya and Epps 2004). Such color-induced associations have the potential to activate alternative types of regulatory focus. Regulatory focus theory suggests that people can achieve their goals in two different ways, either with a promotion or a prevention regulatory focus (Higgins 1987). Individuals who adopt a promotion focus perceive their goals as hopes and aspiration, and *eagerly* approach matches to their goals. In contrast, those who adopt a prevention focus perceive their goals as duties and obligations, and *vigilantly* avoid mismatches to their goals. We propose that red, due to its associations to danger and failures, is likely to activate a prevention focus because it cautions people to guard against such negative outcomes. Blue, however, is expected to activate a promotion focus, due to its associations to openness and freedom and thus its focus on achieving positive outcomes. Further, empirical studies involving regulatory focus theory have revealed that while a promotion focus increases performance speed and creativity, a prevention focus enhances performance accuracy (Friedman and Forster 2001; Forster et al. 2003). Following this line of research, we hypothesize that red, if activating a prevention focus, should enhance performance on detail-oriented cognitive tasks, whereas blue, if activating a promotion focus, should lead to better performance on creative tasks. A series of experiments provide systematic support to our theorizing.

<sup>17</sup>The authors would like to thank Joan Meyers-Levy for her very helpful comments on an earlier version of the paper. Financial support from the Social Sciences and Humanities Research Council of Canada is gratefully acknowledged.

All studies were run on computers and color was manipulated via background screen color. The first study employed two tasks to test the basic hypothesis that red/blue can induce primarily a prevention/promotion focus. First task involved indicating a preference for a prevention or a promotion focused brand from the same product category (Zhou and Pham 2004). The second task asked participants to solve a set of anagrams containing prevention, promotion or control target words. Results supported our hypothesis that red (blue) activates primarily a prevention (promotion) focus. Individuals in the red (blue) condition showed higher preference for brands featuring prevention (promotion) benefits and took significantly less time to solve prevention (promotion) focused anagram words. An auxiliary study demonstrated that our color manipulation did not affect mood.

Study 2 examined whether red (blue), due to activated prevention (promotion) focus, can enhance performance on detail-oriented (creative) cognitive tasks. A detailed-oriented task (a memory task) and a creative task (generating creative uses of a brick) were employed. As anticipated, better performance (i.e., accuracy) was observed in the red versus blue or control condition for the memory task, while those in the blue condition produced more creative responses in the creative task.

Study 3 replicated study 2 results using a different set of tasks, namely a proofreading task (detail-oriented) and a Remote Associates Test (creative task; Mednick 1962). More importantly, it offered insights on the underlying mechanism. We found that red can activate a prevention focus and thus enhance performance on a task requiring attention to detail, whereas blue can activate a promotion focus and therefore enhance performance on the creative task.

In the final study, we tested an important marketing implication from our theorizing. If red leads to prevention focus, it should enhance persuasion when paired with an ad that features images that are unambiguously related to the target product (e.g., specific product details). This is so because such clearly unambiguous, product-related images ensure these prevention-focused individuals that everything is in order and the ad involves no ambiguity. In contrast, blue, due to its activation of promotion focus, should enhance persuasion when paired with an ad that features images that are remotely related to each other and to the product. As such a setup provides opportunities for these promotion-focused individuals to engage in creative processing. An ad featuring either unambiguously or remotely related images was adopted from Zhu and Meyers-Levy (2007). As expected, those in the red condition were more persuaded when the ad featured unambiguously related images than remotely related ones, whereas the opposite was true for those in the blue condition.

In sum, findings from this paper contribute to our knowledge in two ways. First, it reconciles a conflicting set of results observed in the color literature (i.e., whether red or blue enhances cognitive performance?). We demonstrate that while red leads to a prevention focus and thus better performance on detail-oriented tasks, blue leads to a promotion focus and thus better performance on creative tasks. Second, findings from this research offer important marketing insights. While prior research has demonstrated that blue generally leads to more favorable consumer responses, our theory and data suggest conditions where red can enhance persuasion.

## References

- Babin, Barry J., David M. Hardesty and Tracy A. Suter (2003), "Color And Shopping Intentions: The Intervening Effect Of Price Fairness And Perceived Affect," *Journal of Business Research*, 56, 541– 551.
- Elliot, Andrew J., Markus A. Maier, Arlen C. Moller, Ron Friedman and Jorg Meinhardt (2007), "Color and Psychological Functioning: The Effect of Red on Performance Attainment," *Journal of Experimental Psychology: General*, 136(1), 154–168.
- Forster, Jens, Tory E. Higgins, and Amy Taylor Bianco (2003), "Speed/accuracy decisions in task performance: Built-in trade-off or separate strategic concerns?," *Organizational Behavior and Human Decision Processes*, 90, 148-164.
- Friedman, Ronald S., and Jens Forster (2001), "The Effects of Promotion and Prevention Cues on Creativity," *Journal of Personality and Social Psychology*, 81 (6), 1001-1013.
- Hatta, Takeshi, Hirotaaka Yoshida, Ayako Kawakami, Masahiko Okamoto (2002), "Color Of Computer Display Frame In Work Performance, Mood, And Physiological Response," *Perceptual Motor Skills*, 94, 39-46.
- Higgins, E. Tory (1987), "Self-Discrepancy: A Theory Relating Self and Affect," *Psychological Review*, 94 (July), 319–40.
- Kaya, Naz and Helen H. Epps (2004), "Relationship Between Color And Emotion: A Study of College Students," *College Student Journal*, 38 (3), 396-405.
- Kwallek, Nancy and Carol M. Lewis (1990), "Effects of environmental colour on males and females: A red or white or green office," *Applied Ergonomics*, December, 275-278.
- Mednick, Sarnoff A. (1962), "The Associative Basis Of The Creative Process," *Psychological Review*, 69 (3), 220-232.
- Soldat Alexander S., Robert C. Sinclair and Melvin M. Mark (1997), "Color as an Environmental Processing Cue: External Affective Cues Can Directly Affect Processing Strategy without Affecting Mood," *Social Cognition*, 15(1), 55-71.
- Verhoeven, Joost W. M., Marcel E. Pieterse and Ad Th. H. Pruyn (2006), "Effects of Interior Color on Healthcare Consumers: A 360 degree Photo Simulation Experiment," *Advances in Consumer Research*, 33, 292-293.
- Zhou, Rongrong and Michel T. Pham (2004), "Promotion and Prevention across Mental Accounts: When Financial Products Dictate Consumers' Investment Goals," *Journal of Consumer Research*, 31 (June), 125-135.
- Zhu, Rui (Juliet) and Joan Meyers-Levy (2007), "Exploring the Cognitive Mechanism that Underlies Regulatory Focus Effects," *Journal of Consumer Research*, 34 (June), 89-96.