Effects of Color on Consumers’ Perceptions of Package Volumes

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Research in marketing has examined the effects of visual biases on consumers’ judgments of product volumes. In the present research, we combine research indicating that packages that attract more attention are perceived to have a greater volume with research suggesting that high wavelength colors (e.g., red) attract more attention than low wavelength colors (e.g., purple) to hypothesize that consumers judge products to have greater volumes when their packages have a high wavelength color than when they have a low wavelength color. We report results from three studies that support our hypothesis.

[to cite]:

[url]:
http://www.acrwebsite.org/volumes/15451/volumes/v37/NA-37

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A body of research in marketing has examined the effects of visual biases on consumers’ judgments of product volumes (see Krishna 2007 and Raghunib 2007 for reviews). Although the potential influences of a package’s proportions and shape on consumers’ judgments of product volumes have been studied extensively, marketing research has not examined the potential of package color to bias consumers’ product volume judgments.

Folkes and Matta (2004) observed that attention and size often covary, and provided evidence that attentional differences contaminate people’s judgments of relative size such that objects that attract more attention are judged as larger. Their logic is essentially based on reversing the argument that large sizes attract more attention.

Fashion consultants often suggest that if you want to attract attention, you should wear red (Manji 2009). Research in psychology confirms the common notion that reds (and other high wavelength colors) attract more attention than blues and purples (and other low wavelength colors). Using a variety of methods this research finds that high wavelength colors stand out, “advance,” and are more noticeable, whereas low wavelength colors fade away, “retract,” or go unnoticed (e.g., Johns and Sumner 1948; Luckiesh 1918; Pillsbury and Schafer 1937; Taylor and Sumner 1945).

Combining research suggesting that high wavelength colors attract more attention than low wavelength colors with research suggesting that objects that attract more attention appear larger leads us to hypothesize that consumers judge products to have greater volumes when their packages are colored with a high wavelength hue (e.g., red) versus a low wavelength hue (e.g., purple).

Consistent with our hypothesis, research in psychology that has examined the effect of color on people’s size judgments has often found that red objects appear larger than equally-sized purple or blue objects (e.g., Bevan and Dukes 1953; Claessen, Overbeeke, and Smets 1995; Gundlach and Macoubrey 1931; Wallis 1935; Warden and Flynn 1926). It is also notable that differences in the perceived size of the red and blue areas of the French flag (which are actually equally sized) resulted in an official recommendation to reduce the size of the red area compared to that of the blue (Helson 1951).

A weakness of past research on the effect of color on size judgments is that most of this research did not utilize a standardized color system that differentiates between the various shades of colors. Another weakness of past research in this domain is that it is solely empirical, and does not advance a theory to explain the demonstrated results. We report results from three studies that support our hypothesis.

In study 1, we asked 118 participants to view 30 slides, each of which displayed a pair of shapes arranged vertically that differed in color, and to report which of the two shapes appeared larger. On two of the slides, the shapes were actually of an identical size and differed only in color (red vs. purple and green vs. yellow). Consistent with our hypothesis, significantly more participants judged the red shape to be larger than the purple shape (N=55 vs. N=25), (χ² (1)=11.25, p<.01). We also obtained this effect with colors that were closer in wavelength, as significantly more participants judged the yellow shape to be larger than the green shape than vice versa (N=58 vs. N=22), (χ² (1)=16.20, p<.01).

In study 2, we asked 11 participants to view pictures of 12 product packages, to estimate the volume of each package in fluid ounces, and to answer a series of distracter questions about each product. We photographed the products next to a can of soda that served as a volume reference and used professional software to re-color the products’ packages. One package, a bucket of fish food, appeared twice in the series, once colored red and once colored purple. Consistent with our hypothesis, a within-subjects ANOVA revealed that participants’ estimates of the volume of the fish food bucket were significantly higher in the red condition (M=199.09 fl. oz.) than in the purple condition (M=109.27 fl. oz.), (F(1, 10)=5.21, p<.05).

In study 3, we asked 16 participants to complete the same procedure as in study 2, but with different product packages, and the addition questions about willingness to pay and liking of the package colors. We implemented the red vs. purple color manipulation using a box of detergent. Consistent with our hypothesis a within-subjects ANOVA revealed that participants’ estimates of the volume of the detergent box were significantly higher in the red condition (M=3083.33 mL) than in the purple condition (M=2262.67 mL), (F(1, 14)=4.64, p<.05). The color manipulation also affected participants’ willingness to pay for the detergent, which was significantly higher in the red condition.
(M=$5.36) than in the purple condition (M=$3.50), (F(1, 14)=6.05, p<.05). Participants reported liking packaging of both colors statistically equally (M_red=-1.87 vs. M_purple=-7.3), (F(1, 14)=1.32, p>.2). Furthermore, the aforementioned effect of color on willingness to pay became non-significant when participants’ volume estimates of the red and purple packages were included in the ANOVA as covariates (F(1, 12)=0.78, p=.4). In contrast, when participants’ liking of the red and purple colors were included in the ANOVA as covariates, the effect of color on willingness to pay strengthened (F(1, 12)=14.98, p<.005). Together, these results suggest that color influences willingness to pay via an intermediary influence on volume estimates as opposed to an intermediary influence on attitude toward the packaging.

References
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