

# Exciting red and competent blue: the importance of color in marketing

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**Abstract** From beverages to consumer electronics, marketers are using color in innovative ways. Despite this, little academic research has investigated the role that color plays in marketing. This paper examines how color affects consumer perceptions through a series of four studies. The authors provide a framework and empirical evidence that draws on research in aesthetics, color psychology, and associative learning to map hues onto brand personality dimensions (Study 1), as well as examine the roles of saturation and value for amplifying brand personality traits (Study 2). The authors also demonstrate how marketers can strategically use color to alter brand personality and purchase intent (Study 3), and how color influences the likability and familiarity of a brand (Study 4). The results underscore the importance of recognizing the impact of color in forming consumer brand perceptions.

**Keywords** Color · Brand personality · Aesthetics · Logo design · Package design · Purchase intent

As a marketing tool, color attracts consumers and can shape their perceptions. Through color, a brand can establish an effective visual identity, form strong relationships with a target market, and position itself among competitors in the marketplace, as the classic case of Coca-Cola versus Pepsi

illustrates. To distinguish itself from its main competitor, Pepsi moved away from red and embraced the color blue, spending millions of dollars on marketing initiatives, such as painting a Concorde jet in its signature blue color (Cooper 1996). Both Victoria's Secret and H&R Block used color as the core of their rebranding strategies to create a specific brand personality and thereby reach a particular target audience and differentiate from other brands. The use of color even extends beyond product sales; the Susan G. Komen Breast Cancer Foundation relies heavily on the color pink to increase awareness of its cause. Finally, brands use colors in mass customization strategies; Dell offers an assortment of colorful laptops, Apple provides an ever-expanding array of iPod colors, and Nike's customization process enables consumers to choose colors for each part of their shoes.

Despite these leading industry trends, little academic research has investigated the ways in which color can shape consumer perceptions such as brand personality, familiarity, likability, and purchase intent. Considering the ease with which companies can adjust colors digitally, it becomes an effective tool to help shape brand perceptions. While there has been some early work that focuses on topics pertaining to color (e.g., Babin et al. 2003; Bellizzi et al. 1983; Crowley 1993; Gorn et al. 1997, 2004) more theoretically based research is needed to move beyond the scant anecdotal mentions of the use of color in consumer behavior and branding textbooks.

This investigation addresses the importance of color for brand management by focusing on the relationship between color and brand perceptual measures in a series of four studies. We propose hypotheses and establish empirical evidence, drawing on theories of aesthetics, color psychology and associative learning, to map ten colors onto brand personality dimensions (Study 1). We also consider the

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potential amplifying roles of color's two other components, saturation and value (Study 2). Saturation refers to the amount of pigment in a color; a color with low saturation appears gray and washed out, whereas one with high saturation appears very vivid. Value is the amount of lightness or darkness relative to a scale that ranges from black (low) to white (high). Additionally, we demonstrate some strategic uses of color to alter brand personality and purchase intent (Study 3) and examine the incremental impact of brand logo shape and color on brand personality, familiarity, and likability (Study 4). Overall our results contribute to the literature by showing that all three color components play a role in the formation of consumer brand perceptions. By examining such relationships in the context of logo design, our findings extend existing knowledge in this understudied area (Keller and Lehmann 2006); we focus on a brand's logo color as a key visual cue related to other marketing elements such as packaging, product design, and advertising.

The remainder of this paper adopts the following organization: First, we review literature on brand personality and color. Then, based on theories of aesthetics, color psychology, and associative learning, we link these literature streams and propose hypotheses. Second, we test the hypotheses in a series of four studies. Third, we conclude with some managerial and theoretical implications and suggestions for further research.

## Theoretical background

### Brand personality

Early research examined the symbolic nature of brands (Levy 1959) and eventually gave rise to the concept of brand personality (Aaker 1997; Aaker et al. 2001; Plummer 1984). In developing this construct, consumer researchers have established reliable scales (Aaker 1997), revealed how brand personality encourages self-expression and association (Belk 1988; Kleine et al. 1993; Malhotra 1981), and tested for the benefits and consequences of brand personality (Batra et al. 1993; Freling and Forbes 2005; Freling et al. 2010).

The brand personality metaphor compares the unique traits of brands with people (Stern 2006). Defining brand personality as “the set of human characteristics associated with a brand,” Aaker (1997, p. 347) offers a brand personality scale based on the “Big Five” human personality traits. This scale uses 42 items to describe sincerity, excitement, competence, sophistication, and ruggedness, which themselves comprise 15 facets. Marketing scholars have largely embraced this scale and validated it across a variety of contexts and cultures (Aaker et al. 2001), and they

have extended its conceptualization and measurement to other areas such as the nonprofit sector (Venable et al. 2005). The scale is not immune to criticism, especially regarding its conceptual validity (e.g., Azoulay and Kapferer 2003), yet it remains the standard measure in brand personality research (Keller and Lehmann 2006).

Brand personality can influence consumer preferences and usage (Biel 1993), transform user experiences (Aaker and Stayman 1992), and serve as a building block for relationship building, trust, and loyalty (Fournier 1998). Recent empirical work shows that brand personality impressions are updated with new brand-related encounters (Wentzel 2009), are an important element in service environments (Baker and Cameron 1996), alter consumer attitudes, and increase purchase intentions (Batra and Homer 2004; Freling et al. 2010) and brand equity (Freling and Forbes 2005).

Despite the plethora of studies on brand personality, surprisingly little research identifies or empirically tests its antecedents. Prior literature suggests that brand personality derives from many factors, including brand name, product attributes, advertising, logo, and package design (Batra et al. 1993), though largely without empirical support (cf. Grohmann 2009; Orth and Malkewitz 2008). Furthermore, existing work ignores potential influences on brand personality, such as naming, distribution channels, and pricing strategies, nor has it addressed the influence of sensory elements such as music, color, and scent. Understanding how color can help create and reinforce brand personality thus is useful to both academics and practitioners.

### Color

Like a carefully chosen brand name, color carries intrinsic meaning that becomes central to the brand's identity, contributes to brand recognition (Abril et al. 2009), and communicates the desired image (Bottomley and Doyle 2006). Brand loyalists thus become attached to a brand's visual identity and may complain in response to changes in a brand's color scheme (Kahney 2003). Existing discussions on the use of color generally are based on anecdotal evidence and offer scant insight into the processes by which colors affect perceptions (Gorn et al. 1997). In turn, to make color choices, brand managers often rely on trial and error or the recommendations of consultants, whose judgments rely on their own past experience rather than scientific data. In interviews with 12 creative directors, Gorn et al. (1997) find that 11 confessed they were not familiar with color theory and simply trusted their preferences or gut feelings to make color decisions.

Color has been established as an important variable in the marketing literature and has been shown to affect consumer perceptions of advertising (Gorn et al. 1997), alter perceived

website loading time (Gorn et al. 2004), and affect product category membership (Bottomley and Doyle 2006), among others. However, academic research has not yet investigated the ways in which color can shape consumer brand perceptions such as brand personality. In the next section we review and draw upon theories of aesthetics, color psychology, and associative learning to derive hypotheses regarding the color and brand personality relationship.

*Referential meaning of aesthetic stimuli* Aesthetic stimuli have the potential to stimulate and shape people's perceptions through both embodied and referential meaning (Zeltner 1975). According to aesthetic philosophy, embodied meaning is intrinsic to the stimulus, while referential meaning depends on the network of associations activated from exposure to the stimulus (Zeltner 1975, pp. 41–42). Research in marketing has supported this framework in terms of understanding how another aesthetic stimulus, music, can communicate meaningful messages and associations (Zhu and Meyers-Levy 2005). Support for a two dimensional framework in terms of color has also been established (Crowley 1993), where one dimension is purported to stimulate arousal, producing physiological responses such as increased brain activity and heart rate, while the other stimulates evaluative responses, which induce attitude change. Our study is concerned with how color alters consumer perceptions and attitudes, thus we focus on the referential meaning of color and turn to work in psychology on color associations for support and to establish specific hypotheses.

*Associative learning* Hue color associations have been the topic of significant study in psychology literature (see Bellizzi et al. 1983), and recent work (e.g., Elliot et al. 2007; Elliot and Niesta 2008; Schlack and Albright 2007) supports the notion that the formation and activation of color associations can be understood through models of semantic memory such as associative network theory (Bower 1981). Although these studies are restricted in the number of colors and types of emotions and associations they test, the effects of colors remain relatively consistent across studies, which provides some empirical evidence of a systematic relationship between color and emotions (Levy 1984) and psychological functioning (Elliot et al. 2007). For example, people tend to choose consistent color–emotion pairings (e.g., yellow and cheerful; Collier 1996; Levy 1984), and the associations are consistent across cultures (D'Andrade and Egan 1974). Recent work in neuroscience demonstrates that the associative learning of visual information develops during early stages of visual processing as a key mechanism for quick decision-making and survival (Schlack and Albright 2007).

According to memory models, people store semantic information in a complex network comprised of conceptual nodes and links; the nodes represent concepts, which take

on activation values based on a weighted sum of their inputs from the environment and other linked nodes (McClelland 1988). The links represent the pathways between the nodes and are the medium by which units interact. Links are weighted and may be both positive and negative, so that a node can either excite or inhibit related nodes based on the strength and valence of their connections. As nodes become excited, the activation spreads to additional nodes through links; the resulting outcome is determined by the pattern of activation. The link weights are thought to represent knowledge, and learning is conceptualized as the adjustment of weights (McClelland 1988) as individuals use feedback to update associations (Janiszewski and Van Osselaer 2000).

Associations are triggered in memory through color's referential meaning, thus the color (i.e., hue, saturation, and value) of a brand logo should activate related color associations (e.g., reliable, intelligent, corporate), which contribute to the perception of a brand's personality (e.g., competent). Naturally, other non-color aesthetic stimuli, such as logo shape or sound, can activate other brand associations, which together with color inform consumers about the brand's personality. Therefore, if a consumer encounters a branding message (e.g., brand logo) for a known brand, these two cues (color and brand) become activated in memory and together influence brand perceptions. Yet, if a consumer encounters a new brand logo, there are no relevant brand associations existing in memory, and the resulting personality perception is primarily based on activated associations triggered by the referential meaning of the color. In this case, personality perceptions and the subsequent marketing outcomes are highly contingent on color cues.

In addition to explaining how semantic meaning becomes attached to colors, associative learning may also explain why certain product categories become associated with specific colors. Arguably, the semantic meaning of color may be influenced by branding efforts as well; for example, the color pink has taken on new meaning due to its prolific use by the Susan G. Komen Breast Cancer Foundation. As brands pair with colors, brand associations and colors become linked in memory, thus semantic meanings of color are created through a dynamic and reflexive process. Importantly, the activation of color associations, as well as their influence on affect, cognition, and behavior, may occur without a person's conscious awareness or intention (Elliot et al. 2007), operating as a non-conscious prime with the ability to activate various motivations (Mehta and Zhu 2009).

In order to demonstrate how color influences consumer brand perceptions through referential meaning, we map findings from previous work on color associations

to items in the brand personality scale (Aaker 1997) and develop hypotheses for the five dimensions. The theoretical argument for subsequent studies is that when a consumer sees a logo or package, the referential meaning of the color activates relevant associations, which influence the perception of the brand, specifically the brand's personality.

### Hue hypotheses

White, being the total reflection of all colors, can be linked to sincerity as it is associated with purity, cleanness, simplicity, hygiene, clarity, and peace (Fraser and Banks 2004; Mahnke 1996; Wright 1988) and is also associated with happiness (Clarke and Costall 2007). Yellow taps the cheerful facet of sincerity as it generally elicits feelings of optimism, extraversion, and friendliness (Fraser and Banks 2004; Odbert et al. 1942; Wright 1988) and happiness and cheerfulness (Clarke and Costall 2007; Kaya and Epps 2004; Murray and Deabler 1957; Wexner 1954). Pink can also be linked to the dimensions of sincerity as it is considered nurturing, warm, and soft (Clarke and Costall 2007; Fraser and Banks 2004; Mahnke 1996). Therefore, we hypothesize:

H1: The perceived sincerity of a brand is positively affected by the presence of white, and yellow, and pink hues.

The color red can be linked to excitement as it is considered an arousing, exciting, and stimulating color (Bellizzi et al. 1983; Clarke and Costall 2007; Crowley 1993; Gorn et al. 1997, 2004; Murray and Deabler 1957; Walters et al. 1982; Wexner 1954; Wilson 1966). It is generally associated with the characteristics of activity, strength, and stimulation (Fraser and Banks 2004) and is considered up-to-date (Bellizzi et al. 1983).

Research has consistently shown that longer wavelength hues (e.g., red, orange, yellow) induce states of arousal and excitement (Walters et al. 1982). Orange is arousing and exciting, although it is less so than red (Wexner 1954), and it is considered lively, energetic, extroverted, and sociable (Mahnke 1996). Having a medium-long wavelength, yellow also holds qualities of arousal and excitement, but less so than red (Murray and Deabler 1957). Thus, we hypothesize:

H2: The perceived excitement of a brand is positively affected by the presence of red, orange, and yellow hues.

Blue is linked to competence, as it is associated with intelligence, communication, trust, efficiency, duty, and logic (Fraser and Banks 2004; Mahnke 1996; Wright 1988).

It is also seen as a secure color (Murray and Deabler 1957; Schaie 1961; Wexner 1954). Likewise, brown is a color that is related to seriousness, (Clarke and Costall 2007), reliability, and support (Fraser and Banks 2004; Mahnke 1996; Wright 1988). As such, we hypothesize:

H3: The perceived competence of a brand is positively affected by the presence of blue and brown hues.

Black stands for sophistication and glamour (Fraser and Banks 2004; Mahnke 1996; Wright 1988). It is a very powerful color that signals power, stateliness and dignity (Odbert et al. 1942; Wexner 1954). In the fashion world, black expresses status, elegance, richness, and dignity (e.g., black limousines, black tie events, little black dresses, tuxedos, suits). Likewise, purple is a color that also connotes luxury, authenticity, and quality (Fraser and Banks 2004; Mahnke 1996; Wright 1988). Purple is also seen as a dignified and stately color (Murray and Deabler 1957; Odbert et al. 1942; Wexner 1954), which is likely due to its historical past as a color reserved for royalty and to connote social roles. Pink can also be linked to the sophistication dimension as it is considered soft and feminine (Clarke and Costall 2007; Fraser and Banks 2004; Mahnke 1996), which are aspects of the charming facet. Like pink, purple is considered a feminine color (Mahnke 1996), thus touching this facet as well. Therefore, we hypothesize:

H4: The perceived sophistication of a brand is positively affected by the presence of black, purple, and pink hues.

Brown can be linked to ruggedness through associations of seriousness, nature, earthiness (Clarke and Costall 2007), reliability, support (Fraser and Banks 2004; Mahnke 1996; Wright 1988), and protection (Murray and Deabler 1957; Wexner 1954). Green's primary association with nature creates feelings of security (Kaya and Epps 2004) and a connection with the outdoors (Clarke and Costall 2007). Thus, we hypothesize:

H5: The perceived ruggedness of a brand is positively affected by the presence of brown and green hues.

To test these relationships, we conduct Study 1.

### Study 1: hue

To examine the relationship between hue, which refers to the wavelength of a color and what a person typically notes when describing a color (e.g., red, blue, yellow), and brand personality in the context of logo design, we hold the value and saturation levels constant across colors. Although some logos use multiple colors, we rely on single colors to isolate the color effects.



## Variables and procedure

With the help of a professional designer, we adapted a set of fictitious logos from previous research (Henderson and Cote 1998), using Adobe® Illustrator® CS4. Design professionals and academics ( $N=15$ ) confirmed that the fictitious logos were realistic, which was assessed through verbal response. Three items from Kent and Allen's (1994) brand familiarity scale were used to assess familiarity with the logo using 5-point semantic differential scales (anchored unfamiliar/familiar, not knowledgeable/knowledgeable, inexperienced/experienced). Participants indicated they were highly unfamiliar with the logo ( $M=1.28$ ,  $SD=.712$ ). Sample logos are provided in Fig. 1.<sup>1</sup>

To create different color versions of each logo, we manipulated only the hue (e.g., red versus blue). Hue describes segments of wavelengths in the visible spectrum; red has the longest wavelength (700–630 nm) and violet the shortest (450–400 nm). Consistent with prior research, we use high constant levels of saturation (220 of 240 on the hue saturation lightness [HSL] color space) but medium levels of lightness (i.e., value) (120 of 240 on the HSL color space; see Mehta and Zhu 2009). However, white is a color with full value, black is a color with zero value, middle gray has a medium level of value, and brown is orange with mid saturation and low value. These exceptions enable us to cover the spectrum of Berlin and Kay's (1969) 11 universal colors. Because the study uses computer screens, the colors appeared more vibrant than they would in print, which maximizes the hue effect (Gorn et al. 2004).

Two hundred seventy-nine undergraduate students participated in the study for extra credit, 48% of whom were women; their average age was 20.8 years ( $SD=2.05$ ). Furthermore, 71% self-identified as Americans and did not associate themselves with another culture, 16% associated themselves with Asian cultures, and 13% associated with other cultures. An ANOVA indicated no response differences for culture ( $p>.05$ ), so we do not discuss it further. Because six respondents indicated they were colorblind, we excluded them from the analysis.

The settings for the experiments were computer labs containing identical machines, lighting, and other atmospheric elements. The computer monitors were professionally calibrated before the experiments to ensure equivalence. We instructed participants that we were interested in determining which personality traits or human characteristics came to mind when the participants saw a brand logo. Since the logo was the only brand personality

cue that participants were exposed to, we wanted to make sure that participants understood the brand personality concept and the written and verbal instructions indicated that they were rating their perceptions of the brand represented by the logo. In order to understand brand personality, participants read a paragraph describing the construct, which is the same procedure Aaker (1997) used in her scale development study. Participants viewed the logo and were asked to rate the brand on Aaker's (1997) 42-item brand personality scale. Each participant was randomly assigned to a hue condition. Participants provided ratings of the brand's likability and familiarity on a five-point semantic differential affective rating scale, taken from logo design literature (Henderson and Cote 1998), and the familiarity scale taken from branding literature, which we described previously (Kent and Allen 1994). We also collected demographic information about their age, gender, cultural background, and colorblindness, along with their preferences according to their three most liked and three most disliked colors. The reliabilities for all five dimensions of Aaker's (1997) brand personality scale are acceptable (sincerity  $\alpha=.83$ , excitement  $\alpha=.86$ , competence  $\alpha=.83$ , sophistication  $\alpha=.78$ , ruggedness  $\alpha=.81$ ). The covariate reliabilities also are acceptable (likability  $\alpha=.87$ , familiarity  $\alpha=.94$ ). The averaged items form composite indexes for each construct.

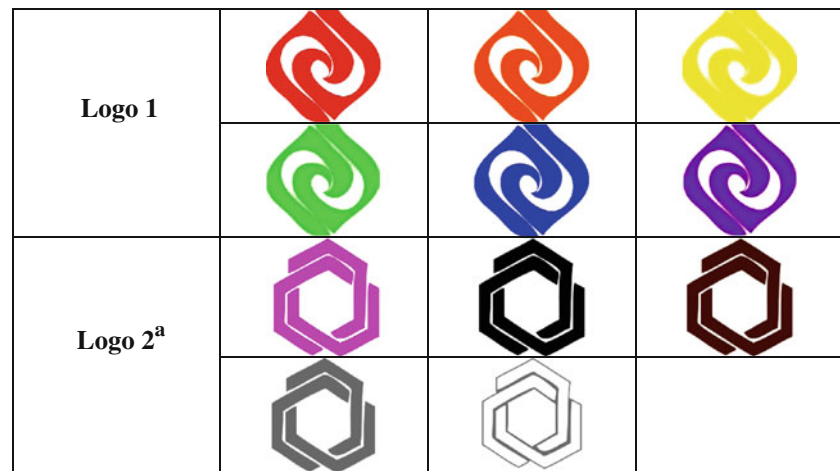
We use dummy coding for the 11 colors, with gray as the reference category. Therefore, the contribution of any color variable to the dependent variables is the sum of the  $\beta$  coefficient and the intercept. We also created a dummy variable to indicate whether the logo color matched the participant's top three preferred colors, where 1 indicates a match. A similar dummy variable applies to the least liked colors. These dummy variables, and the other covariates, help account for personal color preferences.

Finally, we applied a multivariate regression to evaluate the five brand personality dimensions as dependent variables. The ten colors (other than gray) served as the predictor variables, with likability, familiarity, gender, and least/most favorite colors as covariates. After removing colorblind participants and incomplete responses, we retain final sample size of 255.

## Results

The multivariate regression results demonstrate a relationship between color and brand personality; we use the individual regressions for the dimensions to test the hypothesized relationships, as indicated by the shaded cells in Table 1. In addition, the multivariate tests show significant differences for familiarity and likability, though we find no multivariate differences for gender or most/least liked colors.

<sup>1</sup> Participants each rated two fictitious logos for replication purposes. They neither saw a duplicate logo nor a duplicate hue, so the design was completely between-subjects. Significant results were similar between the two logos, thus we only report one logo fully in the text for parsimony.

**Fig. 1** Sample stimuli for Study 1

<sup>a</sup>Logo 2 used for replication purposes and is not reported in text.

**Sincerity** The sincerity regressions are significant (adjusted  $R^2=.151$ ,  $F_{15,239}=4.013$ ,  $p<.001$ ). The positive relationship between sincerity and white ( $\beta=.435$ ,  $t=2.438$ ,  $p=.015$ ) and pink ( $\beta=.379$ ,  $t=2.039$ ,  $p=.043$ ) support H1. While the relationship between sincerity and yellow ( $\beta=.319$ ,  $t=1.702$ ,  $p=.090$ ) offers partial support for it.

**Excitement** The regressions explaining excitement are significant (adjusted  $R^2=.253$ ,  $F_{15,239}=6.733$ ,  $p<.001$ ). The positive relationship between excitement and red ( $\beta=.534$ ,  $t=2.671$ ,  $p=.008$ ) provides support for H2, but we find only partial support for a relationship with orange ( $\beta=.297$ ,

$t=1.711$ ,  $p=.088$ ) and nothing for yellow. In turn, H2 receives only partial support.

**Competence** The regressions explaining competence are significant (adjusted  $R^2=.171$ ,  $F_{15,239}=4.503$ ,  $p<.001$ ). The positive relationship between competence and blue ( $\beta=.522$ ,  $t=2.489$ ,  $p=.013$ ) support H3, but we do not find a relationship between competence and brown. We consider H3 partially supported.

**Sophistication** The sophistication regressions are significant (adjusted  $R^2=.299$ ,  $F_{15,239}=8.208$ ,  $p<.001$ ). We find

**Table 1** Study 1 multivariate regression results

Parameter	Multivariate Test: Wilks' $\lambda$	Sincerity	Excitement	Competence	Sophistication	Ruggedness
Constant	.873***	2.162***	2.088***	2.008***	1.951***	1.442***
Red	.962	.160	.534***	.337	.102	.002
Orange	.931**	-.325*	.297*	-.196	-.474**	-.203
Yellow	.932**	.319*	.227	-.490**	-.243	-.348
Green	.991	.238	.029	.033	.092	.104
Blue	.974	.077	.101	.522**	.166	.149
Purple	.945**	-.008	-.053	-.200	.475**	-.546**
Pink	.959*	.379**	.116	-.018	.432**	-.412*
Black	.921**	-.226	.246	-.064	.697***	.089
Brown	.944**	-.190	-.257	-.136	-.161	.708***
White	.947**	.435**	-.025	-.253	-.157	-.209
Gender	.970	.216***	.059	.063	.087	.066
Familiarity	.953**	.012	.011	-.088	-.023	.174**
Likeability	.659***	.167***	.394***	.290***	.382***	.183***
Favorite	.959*	-.062	-.189*	-.267**	-.270**	-.074
Disliked	.992	-.066	.008	-.061	-.113	.082
Overall Sig F		4.013***	6.733***	4.503***	8.208***	4.125***
Adjusted $R^2$		.151***	.253***	.171***	.299***	.159***

Shaded cells indicate hypothesized positive relationships.

\* $p < .10$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

full support for H4 in the positive relationships between sophistication and black ( $\beta=.697$ ,  $t=3.348$ ,  $p=.001$ ), pink ( $\beta=.432$ ,  $t=2.202$ ,  $p=.029$ ), and purple ( $\beta=.475$ ,  $t=2.531$ ,  $p=.012$ ). Although not hypothesized, we uncover a negative relationship between orange and sophistication ( $\beta=-.474$ ,  $t=-2.575$ ,  $p=.011$ ).

**Ruggedness** The regressions for ruggedness are significant (adjusted  $R^2=.159$ ,  $F_{15,239}=4.125$ ,  $p<.001$ ). In support of H5, we find a positive relationship between ruggedness and brown ( $\beta=.708$ ,  $t=2.949$ ,  $p=.004$ ), but we find no such relationship for ruggedness and green. Although not hypothesized, we also reveal a negative relationship between ruggedness and pink ( $\beta=-.412$ ,  $t=-1.732$ ,  $p=.085$ ), and purple ( $\beta=-.546$ ,  $t=-2.397$ ,  $p=.017$ ). However, we have only partial support for our hypothesis.

## Discussion

In general, we find support for our hypotheses; at the dimension level, we provide partial support for H1, H2, H3, and H5 and full support for H4. Although we did not report analysis at the brand personality facet level for brevity, several relationships suggested by the literature were empirically supported by exploratory regression analyses.

In this sense, Study 1 represents a first step in examining the relationship between color and brand personality through color's referential meaning. We examine hue alone, holding the influence of other components of color, even though previous research (D'Andrade and Egan 1974; Gorn et al. 1997, 2004; Valdez and Mehrabian 1994) suggests strong effects of saturation and value. We address these topics in Study 2.

## Study 2: saturation and value

With our second study, we examine the relationship between the saturation and value of colors and brand personality. Saturation refers to the amount of pigment in a color; it is measured on a scale from low (appearing gray and washed out) to high (appearing vivid). Value is the amount of lightness or darkness relative to a scale that ranges from black (low) to white (high), so a color with high value appears to contain a greater proportion of white (pastels), and a color with a low value appears mixed with black (shades).

### Saturation and value hypotheses

Only recently have researchers examined the effects of saturation and value. As noted by scholars (Gorn et al. 1997; Valdez and Mehrabian 1994), early work in color

psychology and marketing merely examined hue effects. Based on this limited literature, we may only predict relationships between two brand personality traits (excitement and ruggedness) and examine the remaining three dimensions on an exploratory level. Like hue, the referential meaning activated through these components of color should also impact consumer evaluations since many studies point to saturation and value as playing an important, or even more important role than hue for predicting emotions and perceptions (D'Andrade and Egan 1974; Gorn et al. 2004; Valdez and Mehrabian 1994). Thus, in general we hypothesize:

H6: Saturation and value influence brand personality perceptions.

Many studies link both value and saturation to arousal, indicating that saturation has a positive effect on arousal (Valdez and Mehrabian 1994) and value has a negative relationship with arousal (Gorn et al. 1997; Valdez and Mehrabian 1994). Further, it appears that high value has a positive relationship with calmness (Gorn et al. 1997). High value colors lessen the arousing effect of certain hues (e.g., red) by inducing a calming effect (Profusek and Rainey 1987).

Evidence regarding levels of dominance also can be linked to the ruggedness dimension of brand personality; items on the dominance scale focus on feelings of being unrestricted and in control. Highly saturated colors induce such feelings of dominance, whereas greater value levels decrease dominance (Valdez and Mehrabian 1994). Thus, we hypothesize:

H7: High saturation increases arousal and excitement; high (versus low) levels of saturation exhibit a positive relationship with the excitement dimension of brand personality.

H8: High value decreases arousal and excitement; high (versus low) levels of value exhibit a negative relationship with the excitement dimension of brand personality.

H9: Saturation has a positive relationship with the ruggedness dimension of brand personality.

H10: Value has a negative relationship with the ruggedness dimension of brand personality.

### Variables and procedure

For this study, we use a fictitious brand logo developed for Study 1.<sup>2</sup> Four hues offer a more parsimonious, manageable

<sup>2</sup> As in Study 1 we replicated with a second fictitious brand logo, taken from Henderson and Cote (1998). Significant results were similar between the two logos, thus we only report one logo fully in the text for parsimony.

setting, such that Study 2 uses a 2 (saturation: high/low)  $\times$  2 (value: high/low)  $\times$  4 (hue) design. We chose to use red, green, and blue, as they represent primary colors in this color space (RGB) and purple due to its significant effects found in Study 1.

We again created the stimuli using Adobe® Illustrator® CS4 to alter the hue, saturation, and value of the logo. Appropriate levels for saturation (high=100%, low=42%) and value (high=100%, low=58%) match the levels used in previous work in this area (Gorn et al. 2004) (for the sample stimuli, see Fig. 2).

A new sample of 336 undergraduate students participated for extra course credit; the eight participants who indicated they were colorblind were excluded from the subsequent analysis. Forty-eight percent were women, and the average age was 20.8 years (SD=1.67). In terms of cultural identification, 75% indicated that they were American and did not associate themselves with another culture, 11% associated themselves with Asian cultures, and 14% indicated other cultural associations. An ANOVA reveals no response differences for culture ( $p>.05$ ).

Similar to Study 1, the experiment took place in a computer lab containing identical machines, lighting, and other atmospheric conditions, as well as professionally calibrated monitors. Participants were given the same instructions, read the brand personality definition used in Study 1, then viewed the brand logo and rated the brand on Aaker's (1997) 42-item brand personality scale, the familiarity scale (Kent and Allen 1994), and the likability scale (Henderson and Cote 1998). The reliabilities for all five dimensions of Aaker's (1997) brand personality scale and covariates, as they were in Study 1, are acceptable. We averaged the items form composite indexes for each construct.

We ran a multivariate regression analysis with the five brand personality dimensions as the dependent variables and level of saturation (high/low), level of value (high/low), and hue (red, green, blue, and purple) as independent variables. The covariates are the same as those used in Study 1, and we dummy coded the saturation and value levels (0 = low, 1 = high) for the regression. The red hue group provides the reference category; the  $\beta$  coefficients represent a comparison between each condition and the low value, low saturation, red hue condition. After removing colorblind participants and incomplete responses, we retain a sample size of 291.

## Results

In Table 2, we provide the regression analysis results. In support of H6, the multivariate regressions indicate a strong link between value, saturation, and hue with overall brand personality; the individual regressions show that saturation and value relate significantly to the brand personality dimensions, and we find differences in the results relating hue to brand personality. Next, we report detailed results for the two hypothesized dimension, excitement and ruggedness.

**Excitement** The regressions explaining excitement are significant (adjusted  $R^2=.251$ ,  $F_{10,280}=10.694$ ,  $p<.001$ ). As we hypothesized in H7, saturation has a positive relationship with excitement ( $\beta=.204$ ,  $t=3.004$ ,  $p=.003$ ). Value does not have an effect on excitement, thus we find no support for H8.

**Ruggedness** The regression that explains ruggedness is also significant (adjusted  $R^2=.198$ ,  $F_{10,280}=8.175$ ,  $p<.001$ ),

**Fig. 2** Sample stimuli for Study 2<sup>a</sup>

High Saturation Low Value	High Saturation High Value	Low Saturation High Value	Low Saturation Low Value

<sup>a</sup>Second logo was used for replication purposes and is not reported in text.



**Table 2** Study 2 multivariate regression results

Parameter	Multivariate Test: Wilks' $\lambda$	Sincerity	Excitement	Competence	Sophistication	Ruggedness
Constant	.524***	1.916***	2.013***	1.511***	1.919***	1.417***
Saturation	.890***	-.134*	.204***	.275***	-.148*	.243***
Value	.882***	.199**	.052	-.363***	.243***	-.344***
Green	.917***	.321***	.081	.075	-.205*	.278**
Blue	.935***	.394***	-.008	.301***	.063	.092
Purple	.885***	.361***	.004	-.024	.278**	-.414***
Gender	.989	.080	-.030	.068	.005	.118
Familiarity	.938***	.041	-.034	.087*	.059	.188***
Likeability	.705***	.246***	-.410***	.341***	.363***	.172***
Favorite	.969	-.217**	-.010	-.075	-.099	-.012
Dislike	.985	-.149	-.054	.074	-.014	.080
Overall Sig F		6.609***	10.694***	11.341***	8.170***	8.175***
Adjusted R <sup>2</sup>		.162	.251	.263	.198	.198

Shaded cells indicate hypothesized relationships.

\* $p < .10$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

and as we predicted in H9, saturation has a positive relationship with ruggedness ( $\beta = .243$ ,  $t = 2.718$ ,  $p = .007$ ). In addition, value and ruggedness exhibit a negative relationship ( $\beta = -.344$ ,  $t = -3.828$ ,  $p = .000$ ), in support of H10. Purple has a negative relationship with ruggedness ( $\beta = -.414$ ,  $t = -3.346$ ,  $p = .001$ ; while green has a positive relationship ( $\beta = .278$ ,  $t = 2.227$ ,  $p = .027$ ).

## Discussion

Consistent with previous literature that notes their importance (Gorn et al. 1997, 2004; Valdez and Mehrabian 1994), we find that saturation and value, not just hue, have a significant influence on the dependent variables. We thus find support for H6, H7, H9, and H10, though not for H8. These results illustrate that saturation and value influence brand personality and can be used in conjunction with hue to help determine appropriate brand personality decisions.

These findings seem especially useful for brand managers who are limited in their hue choices, because they can alter the value and saturation of a specific hue and still achieve a desired brand personality. Making a color richer or duller or brighter or darker influences consumer personality perceptions, so when managers create a new or redesign their brand logo, they can use this information to create an ideal color choice. For instance, if a manager wants a very sophisticated look for a brand, she should use a purple hue with a high value and low saturation.

As a next step, we experimentally simulate the findings from Studies 1 and 2 to create a target brand personality and examine its influence on purchase intent. Study 3 also extends the generalizability of our previous studies to a package design context.

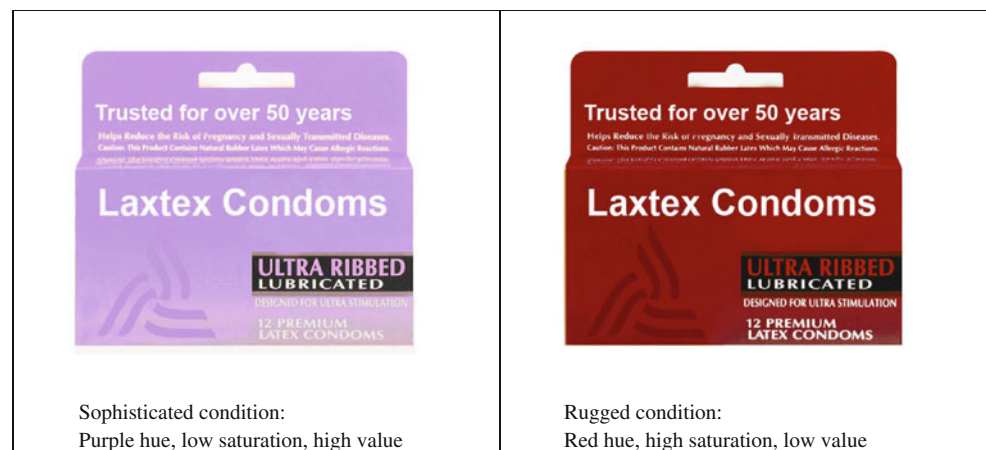
## Study 3: package design

For this study, we alter the perceived personality of a brand simply by changing the package color. We use the findings from Studies 1 and 2 to create a target brand personality based on the levels of hue, saturation, and value linked to specific brand personalities and show how this research can help marketing managers choose colors to create a target personality. In addition, we examine how color induced brand personality relates to likelihood of purchasing a product.

### Variables and procedure

This study adopts a 2 (preferred brand personality)  $\times$  2 (package color) experimental design. We chose condoms as the product stimulus based on a pretest that determined high familiarity with the respondent sample. We created mock packages (see Fig. 3) using Adobe® Photoshop® CS4 by importing digital images of a condom package into the program, removing any identifying marks, inserting fictitious brand marks, and replacing the package colors. Therefore, the only visual variation between the conditions was package color; everything else remained identical.

The package colors chosen match specific target personalities, namely, sophistication or ruggedness. We focus on these two personality dimensions because our Study 1 and Study 2 results show that traits positively associated with sophistication are negatively associated with ruggedness, and vice versa. For example, purple has a positive association with sophistication but a negative association with ruggedness, as does value. Saturation

**Fig. 3** Stimuli for Study 3

instead has a negative association with sophistication and a positive association with ruggedness. Therefore, we choose a high value, low saturation purple hue for the sophisticated package and a low value, high saturation red hue for the rugged package. We use red because there is inconclusive evidence about whether a certain wavelength relates to ruggedness. Thus, our Study 3 hypotheses are as follows:

- H11: A product package with a low saturation, high value purple hue will be perceived as more sophisticated than an identical package with a high saturation, low value red hue.
- H12: A product package with a high saturation, low value red hue will be perceived as more rugged than an identical package with a low saturation, high value purple hue.

Prior research has established that a favorable brand personality can alter consumer attitudes and increase purchase intentions (Batra and Homer 2004; Freling et al. 2010). Following the logic of this research, these color induced brand personality perceptions should also lead to higher purchase intentions so long as they match a consumer's brand personality preference. Thus, we hypothesize:

- H13: Consumer brand personality perceptions of product packages that match a preferred brand personality dimension will lead to higher purchase intentions.

Following the procedures described in Study 1, we conducted the experiment in a computer lab with identical machines, lighting, and other atmospheric elements and calibrated monitors. Participants read a scenario that described the preferred brand personality type for product; they then viewed the package mock-up on a computer screen and completed purchase intention ratings, brand personality measures, manipulation checks, and demo-

graphics. The likelihood that they would purchase the presented product was measured using four seven-point semantic differential items (anchored by not at all likely/very likely, not at all probable/very probable, not at all possible/very possible, and not at all certain/very certain) (Freling et al. 2010). As in Studies 1 and 2, brand personality measures were collected using all 42 items of Aaker's (1997) scale. Demographics and manipulation check items were also collected at the end of the experiment. After competition, participants were thanked and debriefed about the purpose of the study.

For the brand personality manipulations, participants read the following scenario: "Please assume that you are considering buying condoms. You are really interested in finding a brand that is considered durable, strong, and well built (for the sophistication condition these words were replaced with classy, attractive, and refined). You enter a store and notice that the store doesn't carry all the brands you may be familiar with, so you're going to have to make your choice based on the product package alone." We based this procedure from previous work that examined brand personality fit (Batra and Homer 2004). For the brand personality word manipulations, we chose synonyms for items from Aaker's brand personality scale so to not add a bias in our brand personality ratings by repeating words used in the independent variable measures (rugged condition: durable, strong, and well built; sophistication condition: classy, attractive and refined).

In total, 122 undergraduate students participated, 50% of whom were women. The average age was 21.9 years (min=19, max=32, SD=2.30). Three respondents who indicated colorblindness were excluded from the analysis, resulting in a final sample of 119. All scale item reliabilities are again acceptable. The familiarity ratings are below the midpoint of the scale ( $M=1.81$ ,  $SD=1.03$ ) revealing that participants were not familiar with this fictitious brand and their ratings were primarily based off the product package.

## Manipulation checks

Consistent with our expectations and pretest findings for color and brand personality, ANOVAs on the ruggedness ( $F_{1,117}=5.704$ ,  $p=.019$ ) and sophistication ( $F_{1,117}=32.398$ ,  $p=.000$ ) measures both yielded statistically significant results. Participants rated the red, high saturation, low value package ( $M=2.56$ ,  $SD=.77$ ) as higher on ruggedness than the purple, low saturation, high value package ( $M=2.20$ ,  $SD=.79$ ) and the purple, low saturation, high value package ( $M=2.88$ ,  $SD=.85$ ) higher on sophistication than the red, high saturation, low value package ( $M=2.03$ ,  $SD=.76$ ) suggesting that our color manipulations operated as intended. These results also provide support for H11 and H12.

The manipulation check for the scenario manipulations was determined by participants rating six statements confirming what kind of brand they were interested in finding using the words from the brand personality scenario manipulations on 5-point semantic differential items (anchored by disagree/agree). An ANOVA on the brand personality scenario manipulations yielded statistically significant results (rugged  $F_{1,117}=80.764$ ,  $p=.000$ ; sophisticated  $F_{1,117}=29.633$ ,  $p=.000$ ) and revealed that participants in the rugged condition rated their preference for a rugged brand ( $M=4.34$ ,  $SD=.84$ ) as being higher than for a sophisticated brand ( $M=2.46$ ,  $SD=1.38$ ). Likewise, participants in the sophisticated condition rated their preference for a sophisticated brand ( $M=3.94$ ,  $SD=.84$ ) as being higher than for a rugged brand ( $M=2.94$ ,  $SD=1.13$ ). Taken together, initial results suggest that all manipulations operated in the intended manner.

Lastly, ANOVAs were preformed to ensure that the brand personality scenario manipulations did not affect brand personality ratings. The ANOVAs reveal that the scenario manipulation did not significantly affect participants' ratings of ruggedness ( $F_{1,117}=.022$ ,  $p=.883$ ) nor sophistication ratings ( $F_{1,117}=3.125$ ,  $p=.076$ ) at the .05 level. This finding reassures that brand personality ratings were not affected by the manipulations.

## Analysis of the effect of brand personality on purchase intent

For our main analysis, we conducted regressions with the two brand personality ratings (rugged and sophisticated) as the independent variables and purchase intent as the dependent variable. The results match our predictions. For the rugged brand scenario, the regression is significant (adjusted  $R^2=.091$ ,  $F_{2,60}=3.990$ ,  $p=.024$ ). As we predicted in H13, the ruggedness rating has a positive relationship with purchase intent ( $\beta=.588$ ,  $t=2.212$ ,  $p=.031$ ), yet the sophistication rating does not ( $\beta=.177$ ,  $t=.768$ ,  $p=.446$ ). Likewise, for the sophisticated brand scenario, the regression is significant (adjusted  $R^2=.125$ ,  $F_{2,57}=5.061$ ,  $p<.010$ ).

As we predicted in H13, the sophistication rating has a positive relationship with purchase intent ( $\beta=.596$ ,  $t=2.890$ ,  $p=.005$ ), yet the ruggedness rating does not ( $\beta=.227$ ,  $t=.994$ ,  $p=.325$ ).

## Discussion

We use the findings from Studies 1 and 2 to create a target brand personality, solely by changing the package color of a product. This study simulates the role of a brand manager who is attempting to achieve a target personality. Not only do we find support for H11 and H12, but we also replicate previous results and offer greater generalizability by extending the findings to the context of package design and show that color induced brand personality perceptions can affect purchase intentions (H13). These results extend our previous findings by showing how color can affect marketing outcome variables such as purchase intent.

However, the preceding studies all use fictitious brand logos and brands and do not take into account how other aesthetic elements of a brand logo may affect consumer perceptions. Therefore, we use 100 real brand logos to examine the importance of color cues in combination with logo shape.

## Study 4: incremental effects of color for logo design

The purpose of this study is to examine the incremental effects of color in conjunction with other aesthetic stimuli. Other aspects of a brand logo such as shape carry meaning, and past research supports this by showing how logo shape has the ability to alter consumer perceptions (both positively and negatively), such as recognition and positive brand evaluations (Henderson and Cote 1998; Schechter 1993). However, these studies do not discern the value of logo color from other brand cues.

In Study 4, we examine the incremental effects of two aesthetic stimuli, color and logo shape, on perceptions of brand personality, likability, and familiarity. Following established procedures in design research (Henderson and Cote 1998; Henderson et al. 2004; Orth and Malkewitz 2008), we conduct our analyses at the stimulus level rather than the individual level; thus, the unit of analysis is the brand. Using 100 real brands, we compare the brand personality, likability, and familiarity ratings of (1) brand name only, (2) logos in grayscale, and (3) logos in their official colors. For this exploratory work, we do not put forth formal hypotheses; however, we offer the following research question:

RQ1: What is the incremental value of color for logo design and how does it affect likability, familiarity, and brand personality?

## Variables and procedure

The participants were 450 non-colorblind U.S. residents obtained from a paid online research panel; 70% were women, and their average age was 45.34 years ( $SD=11.52$ ).

The 100 selected brands come from Interbrand's (2009) Top Brand Report. For each brand, we created three stimuli condition groups and assigned participants randomly to them. The first group ( $n=150$ ) viewed a brand name in Arial font, with a middle gray color. Arial is non-decorative and common; in addition, none of the brands use this font or color for their logo. The second group ( $n=150$ ) also considered a middle gray version of the brand's logo, and the third group ( $n=150$ ) reviewed a full-color version (see Fig. 4 for sample stimuli). Both brand and condition are between-subjects factors, so participants rated a particular brand once, and all brands rated reflect the same stimulus condition (i.e., name only, gray logo, or color logo). Each participant rated ten brands, resulting in 4,500 brand ratings.

To measure brand personality in this study, we used a shortened version of Aaker's (1997) scale with 15 items, which has been proven reliable (Orth and Malkewitz 2008). The reliabilities in our study are acceptable. Participants also rated the brands on familiarity ( $\alpha=.92$ ) and likability ( $\alpha=.89$ ), using the procedures outlined for Studies 1 and 2. To obtain scores for each stimulus on a specific variable (e.g., brand name only), we averaged the individual scores for each brand and conducted our subsequent analyses at the brand level.

## Analysis and results

The five brand personality dimensions plus likability and familiarity provide seven dependent variables. For each dependent variable, we conducted three paired t-tests to assess the differences among the stimuli. The first t-test, between the grayscale version of the logo and the brand

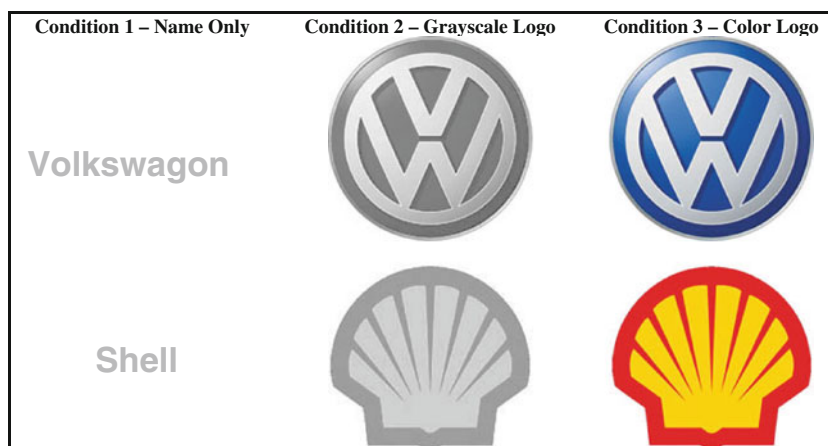
name only condition, indicates the impact of the logo shape on the dependent variable. The second paired t-test, between the color and grayscale versions of the logo, reveals the impact of color, and the final t-test, between the color version of the logo and brand name, shows the joint impact of color and the logo shape.

In line with the results from our previous studies, we find that color affects brand personality. As we show in Table 3, paired t-tests between the color and grayscale versions of the logo reveal a significant change in the excitement ( $t=4.172$ ,  $p=.000$ ) and competence ( $t=3.546$ ,  $p=.001$ ) dimensions. The combination of logo shape and color significantly alters the ruggedness dimension ( $t=-2.249$ ,  $p=.027$ ). In addition, likability increases with logo shape ( $t=2.806$ ,  $p=.006$ ), color ( $t=2.188$ ,  $p=.031$ ), and their combination ( $t=4.634$ ,  $p=.000$ ). Changes in familiarity result from logo shape ( $t=2.439$ ,  $p=.017$ ) and the combination of color and logo shape ( $t=2.535$ ,  $p=.013$ ), but not by color on its own ( $t=.659$ ,  $p=.511$ ).

Just as design elements can positively and negatively affect brand evaluations (Schechter 1993), we find that a color can either increase or decrease the perception of a particular personality trait, as we found in Studies 1–3. On average, across the five brand personality dimensions, ratings increase between the color and grayscale logo conditions for 53% of the judgments. These aggregate results may mask relationships at specific color levels.

The lack of color assortment within this sample also may explain the lack of significance in the results for all brand personality dimensions. An overwhelming number of logos contain three main colors: red ( $n=26$ ), blue ( $n=35$ ), and black ( $n=34$ ). Therefore, we ran a separate analysis for these color subsets using an independent coder to identify the predominant color of each brand logo. We predict a significant increase in brand personality dimension ratings between the grayscale and color versions, but only when we find a match between the color and brand personality

**Fig. 4** Sample stimuli for Study 4





**Table 3** Study 4 means and t-tests

	Sincerity	Excitement	Competence	Sophistication	Ruggedness	Likability	Familiarity
Total $n=100$							
Name <sup>a</sup>	3.15 (.42)	3.38 (.46)	3.63 (.45)	3.11 (.47)	2.93 (.50)	3.44 (.71)	3.69 (.49)
Gray	3.17 (.42)	3.32 (.40)	3.60 (.45)	3.12 (.40)	2.87 (.50)	3.53 (.64)	3.75 (.44)
Color	3.18 (.44)	3.45 (.40)	3.70 (.41)	3.17 (.41)	2.84 (.52)	3.60 (.71)	3.78 (.50)
Gray—Name <sup>b</sup>	.474 (.636)	−1.720 (.089)	−1.203 (.232)	.187 (.852)	−1.563 (.121)	<b>2.806 (.006)</b>	<b>2.439 (.017)</b>
Color—Gray	.448 (.655)	<b>4.172 (.000)</b>	<b>3.546 (.001)</b>	1.650 (.102)	−.940 (.349)	<b>2.188 (.031)</b>	.659 (.511)
Color—Name	.779 (.438)	1.438 (.153)	<b>2.160 (.033)</b>	1.554 (.123)	<b>−2.249 (.027)</b>	<b>4.634 (.000)</b>	<b>2.535 (.013)</b>
Blue $n=35$							
Name <sup>a</sup>	3.10 (.41)	3.26 (.43)	3.55 (.44)	3.02 (.33)	2.88 (.49)	3.36 (.72)	3.59 (.49)
Gray	3.06 (.41)	3.21 (.40)	3.46 (.48)	2.99 (.29)	2.80 (.45)	3.45 (.65)	3.63 (.44)
Color	3.08 (.46)	3.24 (.38)	3.61 (.46)	2.99 (.32)	2.78 (.39)	3.48 (.68)	3.65 (.50)
Gray—Name <sup>b</sup>	−.734 (.468)	−.733 (.469)	−1.579 (.124)	−.628 (.534)	−1.144 (.261)	1.888 (.068)	1.203 (.237)
Color—Gray	.338 (.738)	.653 (.518)	<b>2.467 (.019)</b>	.038 (.970)	−.298 (.768)	.578 (.567)	.229 (.821)
Color—Name	−.438 (.664)	−.244 (.808)	1.039 (.306)	−.422 (.676)	−1.541 (.133)	<b>2.466 (.019)</b>	1.090 (.283)
Red $n=26$							
Name <sup>a</sup>	3.24 (.51)	3.36 (.42)	3.62 (.46)	3.00 (.43)	2.98 (.42)	3.61 (.71)	3.73 (.53)
Gray	3.29 (.47)	3.39 (.36)	3.67 (.41)	3.07 (.38)	2.93 (.45)	3.68 (.62)	3.87 (.46)
Color	3.32 (.47)	3.56 (.41)	3.71 (.42)	3.12 (.41)	2.85 (.43)	3.79 (.69)	3.90 (.48)
Gray—Name <sup>b</sup>	.688 (.498)	.438 (.655)	.862 (.397)	1.155 (.259)	−.713 (.483)	.841 (.409)	<b>2.208 (.037)</b>
Color—Gray	.385 (.703)	<b>2.402 (.024)</b>	.583 (.565)	.888 (.383)	−.992 (.331)	1.457 (.158)	.376 (.710)
Color—Name	.883 (.385)	<b>2.230 (.035)</b>	1.250 (.223)	1.994 (.057)	−1.286 (.210)	2.017 (.055)	2.015 (.055)
Black $n=34$							
Name <sup>a</sup>	3.07 (.36)	3.51 (.52)	3.67 (.46)	3.37 (.56)	2.84 (.49)	3.27 (.70)	3.73 (.46)
Gray	3.12 (.41)	3.35 (.43)	3.60 (.46)	3.33 (.48)	2.86 (.55)	3.40 (.67)	3.74 (.46)
Color	3.09 (.41)	3.50 (.32)	3.75 (.33)	3.45 (.39)	2.84 (.64)	3.43 (.73)	3.79 (.43)
Gray—Name <sup>b</sup>	.939 (.354)	<b>−2.435 (.020)</b>	−1.504 (.142)	−.807 (.426)	3.62 (.720)	<b>2.304 (.028)</b>	.352 (.727)
Color—Gray	−.479 (.635)	<b>3.269 (.003)</b>	<b>3.368 (.002)</b>	<b>2.196 (.035)</b>	−.247 (.807)	.710 (.483)	.738 (.466)
Color—Name	.371 (.713)	−.094 (.926)	1.511 (.140)	1.191 (.242)	.052 (.959)	<b>3.358 (.002)</b>	1.032 (.310)

<sup>a</sup> In these rows, we report the means, with standard deviations in parentheses

<sup>b</sup> In these rows, we report the t-values with  $p$ -values in parentheses; the significant results are bolded

(e.g., red and excitement; blue and competence; black and sophistication).

The results in Table 3 support this notion. For the analysis with only red logos, we find a significant increase in perceived excitement between the color version and the grayscale version ( $t=2.402$ ,  $p=.024$ ) and between the color version and the brand name only ( $t=2.230$ ,  $p=.035$ ). Similarly, for blue logos, perceived competence increases for the color version compared with the grayscale version ( $t=2.467$ ,  $p=.019$ ). For predominantly black logos, perceived sophistication increases with the color version rather than the grayscale version ( $t=2.196$ ,  $p=.035$ ). For both the red and the blue logos, only their matching dimensions increased; the color version of the black logos increases both excitement and competence. The stronger significant results for the black logos may occur because the levels of value are higher in the grayscale version than in the black

version, and as we found in Study 2, competence has a negative relationship with value. Therefore, changes in value levels may be the driving force of these effects.

## Discussion

Our Study 4 results confirm that color plays an important part in driving brand perceptions such as brand personality. When consumers examine logos in full color their perceptions of the personality dimensions of the brand shift. By itself, color improves particular personality ratings when it creates a match between the brand logo color and the personality dimensions (i.e., excitement and red, competence and blue, sophistication and black).

The combination of color and logo shape drives likability and familiarity though. Our results show that both familiarity and likability increase with the addition of

the logo shape (see Table 3) and with the addition of color (especially likability). The likability ratings in the separate color analyses reveal that this effect differs by color. In the case of blue and black, likability ratings increase with the combination of color and shape, but only marginally for red logos. We find no change between the color and grayscale logo versions, but there are marginally significant likability increases between the grayscale and name only versions of the blue logos ( $p=.068$ ) and the name and color conditions ( $p=.055$ ) for red logos.

Using real brand logos, we thus demonstrate that color has a relationship with brand personality, likability, and familiarity. Overall, we find that color cues in combination with brand logo design cues (i.e., shape) amplify familiarity and likability; however it appears that the referential meaning of color is a more important driver in terms of triggering associations that inform brand personality perceptions.

## General discussion

The results of our four studies provide strong support for the relationship between color and brand personality, driven by color's referential meaning. Study 1 demonstrates the link between hue and brand personality; Study 2 further reveals that saturation and value also affect brand personality. Study 3 replicates these findings, extending them to the area of package design and also shows that color induced brand personality can affect purchase intent. With Study 4, we show the incremental value of color in logo design, confirm that color is an important driver of brand personality, and demonstrate that the combination of logo shape and color influences likability and familiarity.

## Theoretical implications

Psychologists have linked color to emotions (Valdez and Mehrabian 1994) and human personality (Lüscher 1969), yet these insights have not been fully integrated with the marketing literature. Using theories of aesthetics and associative learning as a theoretical basis, we merge the color psychology literature with marketing literature to examine how the referential meaning of color affects consumer brand perceptions and subsequent marketing outcome variables.

This paper also contributes to the literature by providing empirical tests of how nonverbal elements can contribute to brand personality (Batra et al. 1993). Crafting a brand personality is an important marketing process that can influence consumer preferences and usage (Biel 1993), transform user experiences (Aaker and Stayman 1992), and serve as a building block for relationship building, trust,

and loyalty (Fournier 1998). Strong, positive brand personalities can enhance consumer evaluations and increase brand equity (Freling and Forbes 2005). Examining aesthetic elements such as color is especially important as once a color becomes attached to a brand, it is oftentimes difficult to change.

Additionally this work answers the call by Keller and Lehmann (2006) to address the brand-building qualities of logos and nonverbal brand elements. With Studies 1, 2, and 4, we add to this under researched important topic of logo design, and in Study 3, we extend the analysis to the realm of package design. This extension also allows us to achieve greater generalizability.

## Managerial implications

Consumers are demanding more color options. The increase of mass customization, computerized design interfaces that enable consumers to make custom products, and simulated online trial environments require managers to understand the role of color for determining consumers' perceptions of their offerings. Color choice once was limited to paint, cosmetics, clothing, and cars; it now extends to various products, including MP3 players, mobile phones, laptop computers, water, athletic shoes, kitchen appliances, gaming devices, and digital televisions. Savvy marketers such as Apple, Dell, and Nike recognize the importance of color as a form of consumer expression and offer multiple choices for their products. The trend toward expanded color use seems to reflect an effort to meet the expanding needs of consumers to identify themselves through their purchases (Belk 1988).

Our research also can inform the development of new brands and the repositioning of established brands. Marketing managers might use color knowledge to choose an appropriate color scheme for logos, packaging, advertisements, storefronts, and websites that will create and reinforce a specific brand personality. However, the importance of color may differ by product category and managers should examine norms within their product categories and competitors' color choices. In sum, a brand can use color to create a distinctive personality, which may be strategy for differentiation.

## Limitations and further research

We conducted Studies 1 and 2 with a small set of fictitious brand logos, and though our realistic logos were based on work by Henderson and Cote (1998), their formats may have affected brand personality perceptions. We acknowledge that brand personality is a rich construct with many factors impacting these perceptions, including design (e.g., shape, font, size) and non-design factors (e.g., spokesper-

son, price). This research solely focuses on one design factor; color, in order to establish the role that color plays in affecting consumer perceptions. The research design of Studies 1–3 illustrates the first exposure to a new brand and how color can impact brand judgments. Our preliminary results add to the limited marketing literature on color effects. Researchers could extend our framework to examine other design aspects, such as the shape of a logo, along with other sensory elements, such as scent. Further research may also examine the nonconscious effects of color on non-design variables, such as quality and price evaluations.

The ratings in Study 4 are based on relatively small samples ( $n < 20$ ) of respondents who evaluated real logos. This nonstudent sample is more representative of the general marketplace than are students, but the demographic range of these relatively few evaluators might not achieve full representation.

Our samples were dominated by Americans who did not associate themselves with any other cultures. Yet we cannot ignore that perceptions and meanings of colors vary across cultures (Block and Kramer 2009; Chebat and Morrin 2007; Madden et al. 2000), even though some evidence indicates these differences are being eradicated. For example, modern Chinese brides increasingly opt to wear white wedding dresses, even though white traditionally is a color of mourning in that culture (Baker 2009). Although recent work suggests cultural norms influence color preferences only when those cultural norms are salient (Chattopadhyay et al. 2002), additional work should examine possible cultural differences in the context of logos and package design.

Although many logos in the marketplace contain more than one color, our sample of 100 top brands in Study 4 show that the majority consist of single color (e.g., Coca Cola, IBM, McDonalds, Kellogg's) or one dominant color with a smaller accent color (e.g., Shell, Visa, Starbucks). Evidence from legal cases also suggests that the predominant color of a multicolor logo on its own can play a large role for brand recognition (Abril et al. 2009). These single-color logos we used enable us to isolate the effects, but further research should investigate the interaction of colors. In addition, certain color combinations are infused with particular meanings, such as holidays (e.g., black and orange with Halloween) and country of origin (e.g., red, white, and blue with America).

Research also is needed to understand the role of brand personality across product categories. Colors have multiple associations, thus context may play a large role in which associations are activated in memory. More research should consider color effects in the context of specific product classes. Matching context with appropriate color and brand personality may have an impact on purchase intent. The choice of color relative to competitors may affect the

brand's ability to differentiate from other brands or be identified as belonging to a particular product class.

Finally, matching consumer personality with color choice options may provide another avenue for research, because it has the potential to increase brand loyalty. We postulate that a person's personality determines her color preferences (Choungourian 1972; Lüscher 1969), so if a consumer buys a product in a color that reflects her personality, it should strengthen his or her bond with the brand. Researchers thus should investigate the potential importance of color as a means to improve customer satisfaction and loyalty.

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