Trustworthy Blue or Untrustworthy Red: The Influence of Colors on Trust

Article *in* The Journal of Marketing Theory and Practice · July 2019

DOI: 10.1080/10696679.2019.1616560

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TRUSTWORTHY BLUE OR UNTRUSTWORTHY RED: THE INFLUENCE OF COLORS ON TRUST

Lixun Su, Annie Peng Cui, and Michael F. Walsh

In marketing practice, blue, followed by red, is the most used color in brand logo designs. Academic studies have shown that blue is related more to trust than red, but extant empirical results are somewhat inconclusive. This article further explores this notion using both implicit and explicit methods to test the influence of blue and red on trust. The results across three studies consistently show that blue increases trust more than red, contributing to the current literature by providing solid empirical evidence of the relationship between colors and trust and insight for brand managers into brand logo design and redesign.

Blue is a predominant color in brand logos across different countries and product types. We conducted a pre-study of the top-500 global brands in 2016 and found that approximately one-half of brand logos include the color blue in their design aesthetics and one-third use blue as the theme color. The motivation behind the wide use of blue logos is an intriguing question for both academia and practitioners. The current study explores the role of color in consumer–brand relationship, particularly the impact of the color blue on trust, brand attitude, and perceived product quality.

In color research, the notion that blue is related more to trust while red is related more to distrust is widespread (Mehta & Zhu, 2008). Although empirical studies have provided some evidence for this argument (Labrecque & Milne, 2012), at least three research gaps exist. First, the primary influence of colors on trust, excluding all other contextual factors, remains underexplored. Previous studies have found that consumers perceive blue websites as more trustworthy than red website, but this effect is absent in the context of advertisements (Alberts & van der Geest, 2011; Puzakova, Kwak, Ramanathan, & Rocereto, 2016). The impetus for the current work comes from the question: Do consumers perceive the color blue as more trustworthy than other colors regardless of the context? To answer this question, Study 1 disentangles the main influence of color on trust using an implicit research method, eliminating all contextual variables.

Second, prior studies (e.g., Bottomley & Doyle, 2006; Labrecque & Milne, 2012) have primarily used hypothetical brands to test the influence of colors on trust, whereas the current study focuses on how colors change consumers' trust perceptions of existing brands, especially in the context of logo redesign. Study 2 examines how color influences consumers' trust perceptions of logo redesigns among established brands such as Amazon.com and Sony.

Third, the current branding practice of using blue as the theme color for brand logos begs further scrutiny. Do blue logos indeed convey a high level of trustworthiness to consumers? Study 3 examines whether consumers have higher trust, more favorable attitudes, and higher perceived product quality when brand logos' theme color is blue rather than red.

This research addresses these gaps of logo color choice, experimental stimuli and trust, and in doing so, this research makes the three following contributions. First, we provide empirical evidence of the relationship between color (blue/red) and trust/distrust after controlling for contextual variables via an implicit test. Second, the implicit method adopted in the study provides an alternative way to measure trust while overcoming the limitations and potential biases of survey research. This research method allows us to examine the direct relationship between colors and

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Journal of Marketing Theory and Practice, vol. 27, no. 3 (Summer 2019), pp. 269–281.

ISSN: 1069–6679 (print) / ISSN 1944–7175 (online)
DOI: https://doi.org/10.1080/10696679.2019.1616560

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trust that may not be uncovered by survey research. Third, we show that the use of blue as the theme color of a brand logo increases consumers' brand trust, which in turn increases their brand attitudes and perceived product quality. We contribute to marketing practice by providing managers with practical advice on the use of colors in brand aesthetic decisions. In many cases, aesthetic designs and brand building are an expensive marketing undertaking, usually costing companies millions of dollars (Stampler, 2013; Walsh, Winterich, & Mittal, 2011). The findings of this research should help managers optimize the brand aesthetic investment.

This article is organized as follows: We first review the literature on color theory and propose hypotheses on the influence of colors on trust and the influence of brand logo colors on brand evaluation. We test the hypotheses across three studies. Study 1 examines the influence of the colors blue and red on trust and distrust using an implicit test. Study 2 applies the findings of Study 1 to the marketing area and focuses specifically on the implicit influence of brand logo theme colors on consumers' trust perceptions. Study 3 uses an explicit methodology to test the influences of brand logo theme colors on consumers' trust, brand attitudes, and perceived product quality of newly introduced brands. Finally, we discuss implications and limitations and offer directions for future research.

THEORETICAL BACKGROUND AND HYPOTHESES

The impact of colors

Previous studies indicate that human behavior and emotions are influenced by the hue (e.g., red vs. blue), lightness (the degree of lightness or darkness), and saturation (e.g., dull vs. rich green) of colors in environments naturally and/or socially (e.g., Bitner, 1992; Carole, 1996; De Bock, Pandelaere, & Van Kenhove, 2013; Elliot & Niesta, 2008; Hagtvedt & Brasel, 2017; Kareklas, Brunel, & Coulter, 2014; Lee, Fujita, Deng, & Unnava, 2016). Natural influence refers to the brain's spontaneous and biological responses to colors without learning; thus, natural influence should be consistent across cultures and species (Wang, Shu, & Lei, 2014). According to evolutionary theory, creatures favor things that increase their survival rates rather than those that cause danger. For example, just as daytime provides better chances of survival than nighttime, people tend to prefer light colors (i.e., white) to dark colors (i.e., black) (Kareklas et al., 2014). In addition, because red can increase blood pressure and respiratory rate, it can evoke more aggressive behaviors than blue among both humans and animals (Bagchi & Cheema, 2013; Pryke, Lawes, & Anderson, 2001).

By contrast, social influences of colors on cognitions and emotions are caused by social learning (Wang et al., 2014), which could be explained by associative learning theory. This theory suggests that the association between two objects is formed by frequent combinations (Labrecque & Milne, 2012; Mehta & Zhu, 2008). For example, in the United States, Caucasian Americans are usually described as "white" and African Americans as "black." Researchers have found that, owing to the long history of discrimination against African Americans, both Caucasian Americans and African Americans favor the color white over black (Hill, 2002; Kareklas et al., 2014).

As red and blue lie on opposite sides of the color spectrum, their different influences on humans' emotions, cognition, and performance have attracted much research attention (e.g., Bagchi & Cheema, 2013; Hill & Barton, 2005; Labrecque & Milne, 2012). Prior studies show that red can increase humans' power, competence, arousal, and excitement more than blue (Healey, Uller, & Olsson, 2007; Moller, Elliot, & Maier, 2009). Red also leads to decreases in price offers in negotiations but elicits higher bid jumps than blue (Bagchi & Cheema, 2013). In addition, research has found that consumers undertake more purchases and fewer purchase postponements in retail stores with blue rather than red background color (Bellizzi & Hite, 1992). Other research has shown that blue is related more to trust than red (e.g., Mehta & Zhu, 2008), though empirical evidence is limited. Therefore, the current study aims to empirically examine the influences of blue and red on trust. We adopted two distinctive methodologies (i.e., implicit and explicit measures) to extend internal validity. We also examine whether changing brand logo colors to blue can increase consumer trust in brands and its downstream consequences (i.e., brand attitude and perceived product quality).

The influence of colors on trust

Trust is important in relationship marketing (Grönroos, 1994; Mouzas, 2016) because it reduces exchange parties' perceived risks embedded in a relationship and thus

functions as a key driver in building relationships with consumers, buyers, and other stakeholders (Morgan & Hunt, 1994). For a brand, gaining consumer trust is important in building a long-term consumer–brand relationship and in enhancing brand equity (Chaudhuri & Holbrook, 2001; Delgado-Ballester & José Luis, 2005). This notion of building trust with consumers extends to the realm of brand aesthetics, including logo design. Refining brand logo design such as choosing an appropriate color might increase consumers' trust in the brand (Lowry, Wilson, & Haig, 2014).

Previous studies indicate that blue is a more favorable color than red for most people (Hurlbert & Ling, 2007), because blue is a color of natural space (i.e., sky) and people favor natural environments as a result of evolution (Nutsford, Pearson, Kingham, & Reitsma, 2016). In addition, people have better moods, higher self-esteem, and lower blood pressure in a natural environment (Pretty, Peacock, Sellens, & Griffin, 2005). Therefore, blue can promote relaxation, reduce psychological distress, and increase mental health (Barton & Pretty, 2010; Nutsford et al., 2016; Pretty et al., 2005). As a result, people have lower risk aversion when exposed to a blue environment and, in turn, have higher levels of trust when the color blue is present.

We draw on associative learning theory to examine the relationship between colors and trust. People frequently associate red with something dangerous (e.g., blood, fire), and red can signal stop, danger, or failure, which people try to avoid (Elliot, Maier, Binser, Friedman, & Pekrun, 2009). As such, the color red can prompt people's avoidance motivation (Elliot et al., 2009). Elliot et al. (2009) find that people knock on a red door less frequently than doors of other colors and stay away from a red test cover. Conversely, people often associate blue with peaceful and tranquil objects (e.g., sky, ocean), which they are prone to approach. Therefore, blue prompts an approach motivation (Genschow, Reutner, & Wänke, 2012; Mehta & Zhu, 2008). When approach (vs. avoidance) motivation is activated, people become less (vs. more) risk averse (Friedman & Forster, 2002). Therefore, blue might be able to reduce consumers' perceived risks of a trustee (Mehta & Zhu, 2008), which can increase their trust in the trustee (Mayer, Davis, & Schoorman, 1995). Thus:

H1: Blue is more positively associated with trust than red.

The influence of brand logo theme colors on brand trust

A brand logo, as a core brand identity, can influence consumers' emotions and behaviors (Fajardo, Zhang, & Tsiros, 2016; Phillips, McQuarrie, & Griffin, 2014). As an important element of a brand's logo, the theme color can heavily influence consumers' evaluations of the brand logo (Bottomley & Doyle, 2006; Henderson & Cote, 1998) and their attitudes toward the brand (Jun, Cho, & Kwon, 2008). This phenomenon is best explained by associate network theory (Labrecque & Milne, 2012), which posits that people's memories are stored in an associative network of nodes and links (Bower, 1981). Each color and emotion can be considered a node. Links are the association of two or more nodes (e.g., a certain color is related to a particular emotion) (Bower, 1981). When consumers are exposed to a brand logo color (e.g., blue), the link between the color and its meanings should become activated (e.g., blue is trustworthy) (Baxter, Ilicic, & Kulczynski, 2018). Consequently, consumers are more likely to perceive blue-logo brands as more trustworthy than brands with other logo colors (Baxter et al., 2018). Therefore, we argue that colors designed as part of a brand aesthetic influence consumers' evaluations of brands.

Among all colors used in brand logo designs, the theme color should exert the strongest influence. The theme color of a brand logo is the color predominately used in brand logo design (e.g., the theme color of Walmart's logo is blue, Netflix's theme color is red). This study argues that if blue increases people's trust more than red, they should perceive a brand with a blue theme color as more trustworthy than a brand with a red theme color. Thus:

H2: Consumers' trust in a brand is higher when the theme color of a brand logo is blue than when it is red.

The influence of brand logo theme colors on brand attitude and perceived product quality

One objective of many marketing efforts is to increase brand attitude, or consumers' overall evaluation of a brand (Olsen, Slotegraaf, & Chandukala, 2014) in terms of brand credibility, competence, trustworthiness, and so on (Keller, 2003).

Relationship marketing theory suggests that trust is a key mediator between communication and relational outcomes such as purchase intention and cooperation (Harris & Goode, 2010; Morgan & Hunt, 1994). We argue that trust should mediate the relationship between brand logo colors and brand attitude. Specifically, brand logo colors should influence consumers' trust in a brand, and thus the color blue should evoke more brand trust than red. When consumers trust a brand, they are more committed to the brand and have higher attitudinal loyalty (Chaudhuri & Holbrook, 2001). Finally, consumers should have more favorable attitudes toward a trusted brand than its competitors (Delgado-Ballester & José Luis, 2005). Thus:

H3: Brand trust mediates the relationship between brand logo colors and brand attitude.

Using the same logic, we argue that trust mediates the relationship between brand logo colors and perceived product quality. Previous studies have demonstrated the positive influence of brand trust on consumers' perceived product quality (Reast, 2005). For example, when consumers already trust an established brand, they perceive new products introduced by the brand as of higher quality (Keller & Aaker, 1992). Consumers rely on a brand's trustworthiness in evaluating product quality, particularly when they lack product knowledge (Hem, Grønhaug, & Lines, 2000). Likewise, when consumers perceive brands with blue-colored logos as trustworthy, this trustworthiness is transferred to product quality evaluations. Thus, we posit that consumers will perceive higher product quality for blue-logo brands than red-logo brands.

H4: Brand trust mediates the relationship between brand logo colors and perceived product quality.

STUDY 1: THE EFFECTS OF COLOR ON TRUST

Experimental process

We designed Study 1 to test H1 via an implicit methodology. In particular, we used an implicit association test (IAT) to assess the relationship between trust and color with all other possible contextual variables removed. The IAT is a widely used method in psychology and marketing domains to implicitly gauge the strength of an association between different concepts by measuring participants' reaction times when exposed to experimental stimuli (Bar-Anan, Liberman, & Trope, 2006; Lee, Deng, Unnava, & Fujita, 2014).

In an IAT, a participant is asked to categorize words on the basis of their meanings. The participant is exposed to one word at a time, given two options, and asked to assign the word to one of the options. From the results of a pretest, we used six stimulus words related to color ("indigo," "azure," "scarlet," "crimson," "fire," and "cerulean") and 12 stimulus words related to trust ("doubt," "dependence," "skepticism," "faith," "suspicion," "credence," "hope," "betray," "corruption," "conviction," "reliance," and "disbelief").

The experiment employed four blocks. The first two blocks of the IAT were practice blocks. Specifically, in the first block, the participants were required to categorize the color-related words into a "blue" group or a "red" group, and the second block required them to categorize the trust-related words into a "trust" group or a "distrust" group. The third block was a compatible block, in which we paired "trust" with a "blue" background and "distrust" with a "red" background (see Figure 1, Panel A). Participants were randomly exposed to six trust-related words ("disbelief," "reliance," "conviction," "corruption," "betray," and "hope") and asked to assign the words to either a "trust" or "distrust" category. In addition, three color-related words ("cerulean,""crimson," and "fire")were included as distractors. The fourth block was an incompatible block, in which we reversed the trust/distrust blue/red background combination, pairing "trust" with a "red" background and "distrust" with a "blue" background (see Figure 1, Panel B). In the fourth block, we showed the participants the remaining six trust-related words ("doubt," "dependence," "skepticism," "faith," "suspicion," and "credence") and three color-related words ("indigo," "azure," and "scarlet") and asked them to categorize the words into either the "trust" or "distrust" category. We evaluated participants' choices by assessing whether they correctly completed the task of categorizing the synonyms of trust into the "trust" group and the synonyms of distrust into the "distrust" group. To avoid order effects, we randomized all words in the third and fourth blocks and the appearance of groups for each stimuli word.

Figure 1
Experimental Stimuli

A: Compatible block **B: Incompatible block**

We recruited 154 native-English-speaking workers on Amazon Mechanical Turk (MTurk) to participate in this study. During the course of the experiment, we recorded the participants' response times for each word.

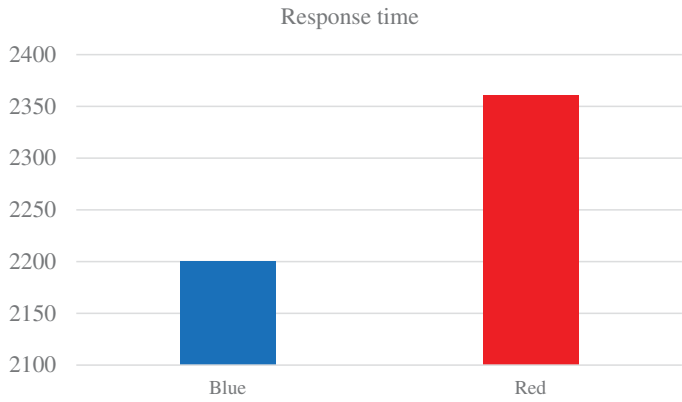
Results and discussion

Greenwald, Nosek, and Banaji (2003) suggest the use of the D-score algorithm to analyze IAT data. Accordingly, we implemented a 600-millisecond penalty for incorrect answers (Greenwald et al., 2003). Then, we deleted 25 outliers with five standard deviations greater than the mean response time. To test the difference in average response times, we conducted a paired t-test on the mean time of trust-related words in compatible and incompatible blocks. The mean response time was significantly shorter in the compatible block pairing "blue" and "trust" (M = 2203 milliseconds, SD = 769 milliseconds) than in the incompatible block paring "blue" and "distrust" (M = 2358 milliseconds, SD = 740 milliseconds; $t(128) = 3.004$, $p < .05$; see Figure 2). The results show that the participants were able to categorize words significantly faster when blue rather than red accompanied trust; this suggests that blue is related more to trust than red, in support of H1.

STUDY 2: THE EFFECTS OF BRAND LOGO THEME COLORS ON BRAND TRUST

The objective of Study 2 is to extend the findings of Study 1 to brand aesthetics. Study 2 also used an implicit methodology to test the effect of brand logo theme colors on brand trust (H2). Here, it was necessary to adapt the prime-target methodology used in Payne's (2001) study, which tests the implicit influence of racial prejudice on judgments. Payne (2001)

Figure 2
IAT Results



first exposed participants to a prime picture (a Caucasian vs. African American) followed by a target picture (a handgun vs. a hand tool picture) and then asked them to classify the target picture as either a handgun or a hand tool. His results show that participants were more likely to misclassify the hand tool picture as a handgun when the prime picture showed an African American than when it showed a Caucasian American, revealing that participants' judgments are biased by implicit racial prejudice.

Using the same logic as in Keith's (2001) experiment, we first showed participants a prime picture (a blue vs. a red brand logo) accompanied by a pair of target pictures (a trustworthy- and an untrustworthy-looking human face) and then asked them to match the brand logo to one of the two target pictures. A positive relationship between blue and trust would be demonstrated if consumers associated blue brand logos with the trustworthy-looking faces and red brand logos with the untrustworthy-looking faces.

Experimental material

For the prime pictures, we morphed the logos of two existing brands, Amazon.com and Sony. We chose these brands for three reasons. First, their logos do not contain either blue or red. The brand logo of Amazon.com is black and yellow, and the Sony brand logo is black and white. Second, Amazon.com and Sony represent different industries, which helps overcome the industry selection bias to some extent. Third, both are well-known brands with which consumers are familiar. We created two brand logos for each brand, one blue and one red.

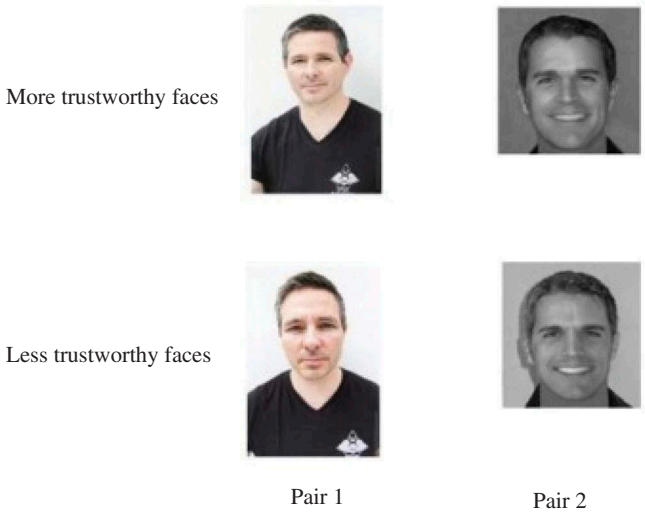
Again, the target pictures were two pairs of human faces tested to look trustworthy and untrustworthy. We adopted one pair (left-hand side of Figure 3) from Libine (2015) and the other (right-hand side of Figure 3) from Tanner and Maeng (2012). The two faces on the top of Figure 3 are trustworthy-looking faces and the bottom two are untrustworthy-looking faces.

Experimental process

At the beginning of the experiment, participants reported their trust in Amazon.com and Sony on a well-established scale (Chaudhuri & Holbrook, 2001). Then, they undertook a distracter task. Next, participants were directed to the main task, in which they were informed that two existing brands (Amazon.com and Sony) were considering changing their current brand logos and were exposed to a new Amazon.com logo (blue or red) and a new Sony logo (blue or red) in a randomized sequence. For each logo, they were asked to match the logo to one of the two human faces (trustworthy- vs. untrustworthy-looking) as target pictures. Depending on participants' selection of the trustworthy- or untrustworthy-looking face, we labeled them as being implicitly trusting of the brand or not. To ensure that the four morphed brand logos orthogonally matched the two pairs of human faces, we designed eight cells during the course of data collection (4 logos [blue Amazon.com, red Amazon.com, blue Sony, red Sony] × 2 pairs of human faces [Pair 1 vs. Pair 2]). We randomly assigned participants to one of these eight conditions. In addition, we included six distracter categorization tasks, such as categorizing the logo change as "necessary" or "unnecessary." Finally, we measured control variables, including color preference (blue, red, warm color, and cold color), with well-established scales.

One-hundred-sixty workers from MTurk participated in this study. After we deleted unfinished questionnaires, responses with failed attention checks, and response times greater than 30 seconds on any categorization task, the final data set contained 135 completed responses to the Amazon.com brand and 144 completed responses to the Sony brand.

Figure 3
Human Faces as Target Pictures



(Source: Libine, 2015; Tanner & Maeng, 2012)

Results and discussion

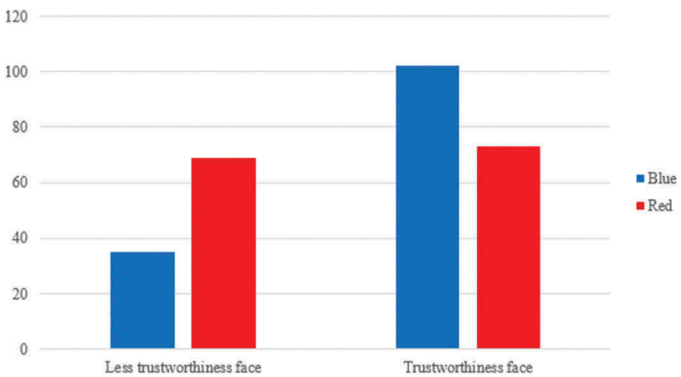
We pooled the responses from both Amazon.com and Sony logos (279 responses). The results show that when the revised brand logos were blue, 102 participants classified the brands as trustworthy, and 35 participants classified the brands as untrustworthy. When brand logos were red, 69 participants classified the brands as trustworthy, and 73 participants classified the brands as untrustworthy. A chi-square analysis on the frequency count showed that the nominal distribution of trustworthiness/untrustworthiness differed under the two conditions ($\chi^2 = 15.84$, $p < .01$). Specifically, according to the results, consumers were more likely to pair the blue-logo brands with

a trustworthy-looking face than the red-logo brands (see Figure 4), Therefore, H2 is supported.

To rule out other possible explanations for the results, we conducted hierarchical linear modeling (HLM) analysis using the "nlme" package in R program to examine the influence of brand logo theme colors on brand trust. In the HLM regression model, which specified brands as random effect, the dependent variable was brand trust (1 = trust, 0 = distrust), the independent variable was brand logo theme color (1 = blue, 0 = red), and the control variable was preference for colors. Consistent with the chi-square test results, the HLM analysis showed that consumers had higher brand trust when the brand logo was blue than when it was red ($\beta = 0.21$, $t = 3.62$, $p < .01$). In addition, preference for blue ($\beta = -0.01$, $t = -0.13$, $p > .10$), preference for red ($\beta = 0.05$, $t = 1.02$, $p > .10$), preference for warm color ($\beta = 0.03$, $t = 1.02$, $p > .10$), and preference for cold color ($\beta = 0.01$, $t = 0.35$, $p > .10$) did not significantly influence consumers' brand trust.

In summary, the results of the chi-square test and the HLM analysis jointly provide solid support for H2, indicating that the color blue increases consumers' brand trust more than the color red. This study used an implicit method to demonstrate the influence of brand logo theme color on brand trust. To further generalize the findings of Study 2, Study 3 used an experiment to test whether the relationship between blue brands and brand trust and its downstream consequences occurs for newly introduced brands as well.

Figure 4
Study 2 Results



STUDY 3: THE EFFECTS OF BRAND LOGO THEME COLORS ON BRAND ATTITUDE AND PERCEIVED PRODUCT QUALITY

Experimental process and stimuli

To further validate the influence of brand logo theme colors on brand trust (H2), Study 3 uses an explicit method to measure consumer trust. In addition, the study tests H3 and H4, which hypothesize the mediating role of brand trust between brand logo colors and brand attitude and perceived product quality, respectively. To overcome the possible influences of hedonic and utilitarian values of products, we created hedonic product (i.e., beer) and utilitarian product (i.e., glue stick) brand logos on the basis of two foreign brands not sold in the United States. The colors of the brand logos were morphed into blue and red. Therefore, there were four scenarios: blue beer logo, red beer logo, blue glue stick logo, and red blue stick logo. Pretest results show that realism and believability of the logo designs were acceptable ($M_{\text{blue glue stick}} = 5.26$, $M_{\text{blue beer}} = 4.69$, $M_{\text{red glue stick}} = 5.06$, and $M_{\text{red beer}} = 5.25$ on a 7-point scale).

We recruited 149 workers on MTurk to participate in this study for compensation of $1. They were randomly exposed to a scenario (i.e., 34 in blue beer, 36 in red beer, 37 in blue glue stick, and 42 in red glue stick). At this stage, the participants read:

> *Please imagine the scenario as follows: You go to Walmart to buy a glue stick (beer), and you spot a new U.S. brand, "M & G (Harbin)." The picture on the right screen shows the logo of the new brand, and the picture on the left shows what the glue stick (beer) is like. Please indicate your opinions about the glue stick (beer) brand, the product, and the logo based on pictures.*

After the participants saw the logos, we measured brand trust, brand attitudes, perceived product quality, and control variables (i.e., color preference, logo attitude, extraversion, and propensity to trust; see Appendix A).

Data, results, and discussion

Table 1 reports the means, standard deviations, and correlations. In addition, the results show that the reliabilities for all variables are acceptable (see Appendix A).

Table 1
Means, Standard Deviations, Correlations, and Reliabilities (Study 3)

	1	2	3	4	5	6	7	8	9	10
1. Attitude toward blue										
2. Attitude toward red	.16									
3. Attitude toward warm colors	.24**	.45**								
4. Attitude toward cold colors	.45**	.24**	0.08							
5. Attitude toward logo design	.23**	.18*	0.16	.17*						
6. Extroversion	.15	0.06	.20*	.03	.25**					
7. Propensity to trust	0.14	0.13	0.08	.09	.30**	0.13				
8. Brand trust	0.14	−.05	0.01	.13	.48**	0.13	.26**			
9. Brand attitude	.23**	.17*	0.14	.16	.76**	.27**	.28**	.57**		
10. Perceived product quality	0.09	0.03	0.02	.15	.62**	.16*	.14	.62**	.64**	
Mean	4.52	3.43	3.89	4.12	3.35	3.15	3.28	4.05	3.48	2.30
Standard deviation	0.65	1.13	0.96	0.90	0.89	1.03	0.42	0.89	0.82	0.50

*$p< 0.05$.
**$p < 0.01$.

Brand Trust, Brand Attitude, and Perceived Product Quality

As the independent t-test results show, the participants had higher levels of brand trust in a blue brand logo than a red brand logo ($M_{\text{trust, blue group}} = 4.25$, $M_{\text{trust, red group}} = 3.87$; $t = 2.64$, $p < .01$), again in support of H2. Participants had more positive attitudes toward the brand when the brand logo was blue than when it was red ($M_{\text{attitude, blue group}} = 3.60$, $M_{\text{attitude, red group}} = 3.34$; $t = 1.84$, $p < .07$). Likewise, perceived product quality was higher when the brand logo was blue than when it was red ($M_{\text{perceived product quality, blue group}} = 2.38$, $M_{\text{perceived product quality, red group}} = 2.23$; $t = 1.84$,$p < .07$).

Mediation

To test the mediating effect of brand trust between brand logo color and brand attitude, we conducted bootstrap estimation with 10,000 resamples through model 4 in SPSS PROCESS (Hayes, 2013), with brand logo color as the independent variable; brand attitude as the dependent variable; brand trust as the mediator; and attitude toward colors (i.e., blue, red, warm, and cold), logo attitude, extraversion, and propensity to trust as covariates. The indirect effect was significant ($B = 0.07$, $SE = 0.03$, 95% confidence interval [CI] = 0.02, 0.15), indicating the mediation. The results are consistent with H3. Using the same procedure, we examined the meditating effect of brand trust on the relationship between brand logo color and perceived product quality. The indirect effect was significant ($B = 0.07$, $SE = 0.03$; 95% CI = 0.02, 0.13), indicating the medication. These results provide support for H4.

GENERAL DISCUSSION

Across three studies using both implicit and explicit methodology and real-world and fictitious brands, we find support for our hypotheses. That is, the color blue is related more to trust, favorable attitudes, and perceived product quality than the color red.

Theoretical implications

Although academic literature suggests that blue is related to trust and red is related to distrust, little empirical research has tested the primary influence of these colors on trust. In this research, which uses three experiments and multiple methodologies, we address three gaps in the literature. Specifically, we explore the choice of color in logo design, using a variety of experimental stimuli and methodologies, and identify a mediator to consumer response to logo color. The collective results indicate that blue generates higher trust than red both implicitly and explicitly. Specifically, the IAT results show that blue is more positively related to trust than red, and the prime-

target experiment results show that the influence is applicable to existing brands.

In addition, the prime-target experiment results show that colors of brand logos implicitly influence consumers' trust in existing brands. A post hoc analysis showed that this effect did not emerge with explicit survey measures. The findings indicate that survey research might be limited in completely capturing consumer trust. Therefore, when investigating consumer trust in existing powerful brands, implicit tests may provide additional insights.

Finally, the results show that for new brands, consumers have a higher level of brand trust in a blue-logo brand than a red-logo brand. Consumers also have more favorable attitudes toward a brand with a blue-logo brand than a red-logo brand, regardless of their attitudes toward the logo design itself, indicating that favorable attitudes are not caused by consumers' attitudes toward logo designs. Previous research suggests that consumers form more positive attitudes toward a brand if they like the brand logo (Whan, Eisingerich, Pol, & Park, 2013). We provide empirical support for this conclusion by showing that brand logo colors have a direct influence on consumers' attitudes toward the brand and perceived product quality. Color, an important part of brand logo aesthetics, indeed plays a vital role in building consumer–brand relationships.

Managerial implications

Brand logo design serves as an important tool of branding, reflecting firms' values and culture and connecting customers with firms. Logo design and redesigns are an expensive proposition (Walsh, Winterich, & Mittal, 2010), and thus firms should be cautious when designing a new logo or redesigning an existing logo.

Our results provide new insights for brand managers into choice of theme color, which is a bedrock to logo design/redesign. As a prominent visual cue, color plays an important role in the design of appropriate, attractive, and effective brand logos. The proper utilization of colors can create a pleasant-looking brand logo, express firms' aesthetic values, and evoke consumers' positive responses. Colors also convey rich meanings. For example, the results show that consumers associate the color blue with trust. Therefore, brand managers could consider using blue as the theme color when designing or redesigning brand logos.

Note, however, that our findings do not suggest that blue is always the best option as the theme color for brand logos. The process of selecting a theme color for a logo is complex and involves multiple factors such as other brand aesthetics, the match between colors and brand image, target markets' preference for colors, and so on. Brand managers should consider the color–trust relationship in addition to these factors when selecting a brand logo theme color.

For brand managers of existing brands, a common assumption is that consumers' long-term brand trust or distrust in the brands is difficult to change. However, our results show that consumers' trust in existing brands is still malleable and could be increased by adding the color blue. As colors influence trust in an implicit way, this influence can be generalized to other marketing contexts beyond brand logo theme colors. As such, brand managers of existing brands can take full advantage of other marketing contexts, such as blue packaging and blue suits worn by salespeople, to increase consumers' trust perceptions.

Limitations and future research

A few limitations of this study may limit the generalizability of the findings. First, this research focused on attitudinal measures such as trust and brand attitude and did not consider actual behavior (e.g., actual product purchase). Previous research indicates that consumers tend to buy more and make quicker decisions when the store background color is blue rather than red (Bellizzi & Hite, 1992). Future research could test whether the likelihood of consumers to buy a product with a blue brand logo or package is higher than that of buying a product with a red logo or package.

Second, we used only one product for each product category, limiting the external validity of the findings. Third, compared with a real-world field study, a laboratory setting limits the generalizability of the findings. Trust formation occurs slowly over time and is influenced by many inputs in the real world (Mayer et al., 1995). Our results cannot explain the process of trust formation, in which colors might interact with other factors such as scents.

Finally, we collected data from native English speakers in the United States, which decreases external validity of the results. Red and blue have different

meanings in different cultures (Madden, Hewett, & Roth, 2000). For example, red means luck, happiness, auspice, and so on in China. Therefore, future research should examine the role of culture in the color–trust relationship.

FUNDING

This work was supported by the West Virginia University [John Chambers College of Business and Economics Survey Research].

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APPENDIX A

CONSTRUCT MEASUREMENTS

Construct	Source	Items	Reliability (Cronbach's α)
Color preference	Madden et al. (2000)	Bad/good Unpleasant/pleasant Ugly/beautiful	Study 2: Blue: 0.93 Red: 0.94 Warm color: 0.97 Cold color: 0.93 Study 3: Blue: 0.90 Red: 0.90 Warm color: 0.95 Cold color: 0.93
Brand familiarity		I am familiar with X.	
Brand attitude	Walsh et al. (2011)	X is a good brand. X is a favorable brand. X is a desirable brand. X is a likable brand.	Study 3: 0.91
Logo attitude	Walsh et al. (2010)	Dislike/like Bad/good Not distinctive/distinctive Not interesting/interesting Not interesting/interesting Low quality/high quality	0.89
Perceived product quality	Olsen et al. (2014)	Unacceptable/acceptable Poor/Extraordinary Bad/good	0.80
Brand trust	Chaudhuri and Holbrook (2001)	X is trustworthy. X is safe. X is reliable. X is dependable.	Study 2: 0.95 Study 3: 0.88
Extraversion	John and Srivastava (1999)	I see myself as someone who is outgoing, sociable. I see myself as someone who is talkative. I see myself as someone who has an assertive personality. I see myself as someone who generates a lot of enthusiasm. I see myself as someone who if full of energy.	Study 3: 0.74
Propensity to trust	Mayer and Davis (1999)	One should be very cautious with strangers. Most experts tell the truth about the limits of their knowledge. Most people can be counted on to do what they say they will do. These days, you must be alert or someone is likely to take advantage of you. Most salespeople are honest in describing their products. Most repair people will not overcharge people who are ignorant of their specialty. Most people answer public opinion polls honestly. Most adults are competent at their jobs.	Study 3: 0.75