Available online at www.sciencedirect.com

ScienceDirect

Journal of Consumer Psychology xx, x (2013) xxx – xxx

Research Report

Judgment is not color blind: The impact of automatic color preference on product and advertising preferences

Ioannis Kareklas [a,*], Frédéric F. Brunel [b], Robin A. Coulter [c]

[a] Washington State University, USA
[b] Boston University, USA
[c] University of Connecticut, USA

Received 8 April 2012; received in revised form 11 September 2013; accepted 12 September 2013

Abstract

This research examines the colors white and black and highlights the importance of automatic preference for the color white over black in product choice and advertising contexts. Across three studies, we incorporate multiple Implicit Association Tests to assess automatic preferences for colors, products, races, and advertisements. In Study 1, we demonstrate an automatic color preference for white over black, show that this preference holds for Caucasian-Americans and African-Americans, and find that automatic color preference predicts automatic product preference of white over black-colored products. Study 2 extends these findings by showing that actual behavioral product choice is best predicted by a combination of automatic and explicit color preferences. In the advertising domain, Study 3 demonstrates how automatic color preference influences advertising responses and how it explains the lack of in-group preference by African-Americans in previous implicit studies of racial preference. Collectively, our research draws attention to the need to disentangle white and black as designation of colors versus racial groups, and offers significant and novel contributions to the work on color and race in consumer psychology.

Keywords: Implicit associations; Automatic preferences; Color preferences; Racial preferences; Advertising preferences; Product preferences

Introduction

For decades, research has documented that color is a dominant visual feature affecting consumer perceptions and behaviors (Aslam, 2006; Bellizzi, Crowley, & Hasty, 1983). Anthropologists and psychologists have directed significant attention toward the colors white and black, and several theories posit that white is preferred to black. Early experience theory holds that dislike for black is linked to primal fears for darkness, the night, and the unknown, whereas liking for white is linked to light, fire, and the sun (Mead & Baldwin, 1971; Williams, Boswell, & Best, 1975). Relatedly, color symbolism theory submits that individuals develop a pro-white color preference through the verbal learning of color associations (Duckitt, Wall, & Pokroy, 1999); white often connotes decency and purity whereas black connotes evil and disgrace (Longshore, 1979). These theoretical perspectives argue that individuals have an automatic, non-conscious preference for white over black. Complicating the understanding of this automatic color preference is the fact that the words "white" and "black" are often used as racial designations for Caucasian-Americans and African-Americans.

Our work offers significant and novel contributions to the work on color and race in consumer psychology. In three studies, we explore automatic color preference using multiple Implicit Association Tests (IATs; Greenwald, McGhee, & Schwartz, 1998) to tap into the associated automatic processes. First, in a product context, we assess the straightforward prediction that when considering preference for products which are available in both black and white colors (e.g., cars), an automatic white color preference should result in a preference for white versus black-colored products, and we test this across Caucasian-

* Corresponding author at: Department of Marketing, College of Business, Washington State University, Todd Addition 375, PO Box 644730, Pullman, WA 99164-4730, USA.
E-mail address: ioannis.kareklas@wsu.edu (I. Kareklas).

1057-7408/$ -see front matter © 2013 Published by Elsevier Inc. on behalf of Society for Consumer Psychology.
http://dx.doi.org/10.1016/j.jcps.2013.09.005

Americans and African-Americans (Study 1). We also examine the effects of automatic versus explicit color preferences on product and behavioral choices, to understand the extent to which each explains unique portions of variance in behavior (Study 2). Second, in an advertising context, we introduce automatic color preference as an explanatory variable to reconcile past findings in which explicit (i.e., self-report) measures demonstrate that African-Americans and Caucasian-Americans respond more favorably to advertisements featuring in-group spokespeople (Schlinger & Plummer, 1972; Simpson, Snuggs, Christiansen, & Simples, 2000), whereas studies utilizing implicit measures find that only Caucasian-Americans exhibit automatic in-group preferences (Ashburn-Nardo, Knowles, & Monteith, 2003; Brunel, Tietje, & Greenwald, 2004; Nosek, Banaji, & Greenwald, 2002). In Study 3, we assess whether automatic color preference can account for these observed differences in effects. We conclude with our theoretical contributions and practical implications.

Automatic color preference

Color plays a key role in advertising, packaging, and store design (Bellizzi et al., 1983), and has the ability to generate attention (Lee & Barnes, 1989) and influence perceptions and behaviors (Aslam, 2006). Furthermore, when consistently connected with some concepts or experiences, colors can become associated with specific psychological meanings (De Bock, Pandelaere, & Van Kenhove, 2013; Elliot, Maier, Moller, Friedman, & Meinhardt, 2007; Mehta & Zhu, 2009). Nonetheless, psychology research acknowledges that color effects are subtle, and little is known about how color perception impacts affect, cognition, and behavior (Elliot et al., 2007).

Automatic color preference and product preference and choice

Two theories are at the heart of automatic color preference. Early experience theory proposes that young children develop color preferences because of experiences with light and darkness (Williams & Morland, 1976). As diurnal beings, humans require light to interact with their environment, and find darkness to be disorienting and aversive; hence, the preference for white over black (Williams et al., 1975). Alternatively, color symbolism theory suggests that children develop pro-white color preferences through the verbal learning of color associations (Duckitt et al., 1999). In religion, literature, and mass media, white often symbolizes "goodness," whereas black connotes "badness" (Williams, Tucker, & Dunham, 1971). Consequently, children learn to make positive associations with the color white and negative associations with the color black. Everyday language (e.g., black sheep, white knight) reinforces these connotations (Frank & Gilovich, 1988).

Past research documents a pro-white/anti-black color preference across individuals from various racial/ethnic backgrounds. Adams and Osgood (1973) report that adults across 23 cultures evaluated the color white (vs. black) more positively. Further, studies using the Color Meaning Test (Williams et al., 1975) document similar effects in European-Americans (Boswell & Williams, 1975), African-Americans (Williams & Rousseau, 1971), and bi-racial-Americans (Neto & Paiva, 1998). Thus, automatic preference for the color white over black appears to be pan-cultural, learned and reinforced through associations in everyday life.

Additionally, marketing research suggests that consumers make product choices based on meanings they associate with colors, and how product colors fit with their overall color preferences (Madden, Hewett, & Roth, 2000). We anticipate that the automatic processes that result in the learned preference for the color white also would result in automatic preferences for white-colored as compared to black-colored products. We posit:

H1. Regardless of racial background, consumers exhibit automatic preferences for the color white over black (H1a), and automatic product preferences for white over black-colored products (H1b).

Although theory suggests that automatic color and product preferences will impact attitudes and behavior, explicit attitudes and choices are driven by many factors, are more deliberative, and rely more on reasoning (Gibson, 2008). Thus, we expect that explicit choice of white over black products is predicated on the availability of both product colors (e.g., phones), as well as relevant cultural norms, fashions or practical considerations that might mandate a specific color in certain contexts (e.g., wearing black at funerals, white in hot climates). However, we argue that, even when at an aggregate level black products are explicitly chosen over white products, individual level explicit preferences and choices are explained by the strength of one's automatic preference for the color white over black. We posit:

H2. Automatic color preference is related to automatic product preference (H2a), explicit color preference (H2b), and explicit product choice (H2c).

A meta-analysis of 184 samples documents that combining implicit (IAT) and self-report measures increases predictive validity, as each predicts a distinct portion of variance in the criterion variable (Greenwald, Poehlman, Uhlmann, & Banaji, 2009), and in particular, consumption behavior (Maison, Greenwald, & Bruin, 2004). As related to color preference, we argue that accounting for *both* automatic and explicit color preferences improves behavior predictions:

H3. Automatic color preference and explicit color preference each predict a unique portion of variance in behavioral choice (H3a), and taken together, they improve choice prediction (H3b).

Automatic color preference and advertisement preference

In the persuasion context, we draw attention to automatic color preference as it relates to consumers' reactions to advertisements featuring Caucasian-Americans and African-Americans. Consistent with the theory of in-group favoritism (Tajfel, Billig, Bundy, & Flament, 1971), research for over forty years using explicit measures reports that Caucasian-Americans and African-Americans tend to evaluate advertisements featuring

Please cite this article as: Kareklas, I., et al., Judgment is not color blind: The impact of automatic color preference on product and advertising preferences, *Journal of Consumer Psychology* (2013), http://dx.doi.org/10.1016/j.jcps.2013.09.005

in-group members more favorably (Schlinger & Plummer, 1972; Simpson et al., 2000; Whittler, 1991). However, recent studies using implicit measures document that Caucasian-Americans exhibit automatic in-group favoritism, but that African-Americans do not (Brunel et al., 2004; Nosek et al., 2002). To-date, system justification theory (Jost & Banaji, 1994) has been used to explain these differences, specifically arguing that a history of discrimination can lead minorities to internalize negative attitudes toward their in-group (Rudman, Feinberg, & Fairchild, 2002), which are likely non-conscious (Jost & Banaji, 1994), and therefore unearthed by implicit (but not explicit) measures (Greenwald & Banaji, 1995).

We offer an alternative explanation for these inconsistent in-group favoritism findings. We posit that automatic preference for the color white is confounding measures of automatic preference for one's race. Individuals develop pro-white/anti-black color preferences at an early age, and research suggests that color preference contributes to the subsequent development of racial preference (Duckitt et al., 1999). Furthermore, a study with Caucasian respondents documents that automatic preference for the color white is correlated with automatic pro-Caucasian racial attitudes (Smith-McLallen, Johnson, Dovidio, & Pearson, 2006).

We argue that because the terms "white" and "black" are used interchangeably in American culture to denote *both* color and race, automatic color and racial associations are inextricably linked in memory, such that both associations are likely activated when consumers encounter Caucasian-Americans/African-Americans. Hence, we posit that automatic race-based preferences are the result of the combined effect of an across-the-board automatic preference for the color white plus a "unique" automatic preference for one's race. The combination of these effects therefore leads to under-estimated automatic pro-African-American preferences among African-Americans, and over-estimated automatic pro-Caucasian preferences among Caucasian-Americans. However, we propose that by accounting for automatic color preference, we can uncover unique preferences for African-Americans and Caucasian-Americans in favor of members of their own race. We posit:

H4. Automatic color preference is related to automatic racial preference (H4a), and automatic advertisement preference (H4b); the stronger the automatic preference for the color white, the stronger the automatic preference for Caucasian-Americans and advertisements featuring Caucasian-American advertising spokespeople.

H5. After accounting for automatic color preference, both African-Americans and Caucasian-Americans exhibit a unique automatic racial preference (H5a) and a unique automatic advertisement preference (H5b) in favor of members of their own race.

Research studies

Study 1

Study 1 examines automatic color preferences for the color white as compared to the color black, and automatic product preferences for white versus black products, among African-Americans and Caucasian-Americans.

Procedures

A total of 243 respondents recruited from an online panel participated in this study. They completed a color IAT and a product IAT, and they reported their racial background and age. The images for the color IAT included six matched pairs of white/black geometric shapes (adapted from Smith-McLallen et al., 2006) and the images for the product IAT included six matched pairs of white/black-colored products (e.g., shoes, sunglasses, automobiles) (see Appendix A). Each IAT also included six pleasant (e.g., "happiness") and six unpleasant (e.g., "misery") words, which were used to evaluate the favorability of associations. The number of stimuli stems from past research documenting that using a small number of suitable exemplars (versus a large number of weak representations) leads to improved construct validity, and that increasing the number of exemplars has minimal impact on effect magnitude and reliability (Nosek, Greenwald, & Banaji, 2005). We used a gray color (RGB 127 127 127; exactly between black and white in color spectrum) for all IAT screens and stimuli backgrounds to ensure that background color did not confound our results.

We followed the standard experimental protocol for IAT studies (Greenwald, Nosek, & Banaji, 2003). The color and product IATs each consisted of seven blocks, and the order of white and black preference blocks was counterbalanced across respondents and IATs. Blocks 1, 2, and 5 were "practice blocks" so that respondents could get accustomed to the procedure; blocks 3, 4, 6 and 7 were "measurement" blocks, and the response latencies in these blocks served as the basis for calculating respondents' automatic preferences. Within each measurement block, participants completed a mixed classification task (40 trials) in which they were randomly presented one of the pleasant/unpleasant words or one of the black/white stimuli (geometric shapes for the color IAT; product images for the product IAT). Participants were instructed to classify as quickly as possible the valence of the word or the color of the shape/product by striking either the "D" or "K" key on the keyboard. In blocks 3 and 4 pleasant words and one of the colors were classified using the same key, while unpleasant words and the other color were classified using the second key. In blocks 6 and 7, the word valence/color pairing was reversed, such that pleasant words now shared the same key with the color paired with unpleasant words in blocks 3 and 4. The computer recorded participants' response latencies in milliseconds (i.e., the time from the onset of each stimulus until its correct classification).

As an initial step in the analysis, we assessed the error rates of each participant, and consistent with Greenwald et al. (2003) dropped twelve participants whose response latency was lower than 300 ms for more than 10% of trials or who had more than 15% of trials with errors in either IAT. We also dropped twelve participants who did not self-identify as Caucasian-American or African-American. Thus, further analyses included 123 Caucasian-Americans and 96 African-Americans (M_{age} = 39 years).

Please cite this article as: Kareklas, I., et al., Judgment is not color blind: The impact of automatic color preference on product and advertising preferences, *Journal of Consumer Psychology* (2013), http://dx.doi.org/10.1016/j.jcps.2013.09.005

Automatic color and automatic product preferences were calculated based on the response latencies from the measurement blocks using the *D* score algorithm, which minimizes the effect of completing multiple IATs (Greenwald et al., 2003). Specifically, for each respondent, this algorithm computes the standard deviation for blocks 3 and 6 combined latencies, and another for blocks 4 and 7 combined latencies. Then it computes 4 means for the latencies in blocks 3, 4, 6, and 7, computes a mean latency difference score between blocks 3 and 6 and also between blocks 4 and 7, and divides the mean latency difference scores by their respective standard deviations computed in the first step of the algorithm. Finally, the *D* score is computed as the average of these two quotients (Nosek, Greenwald, & Banaji, 2007). *D* was scored so that larger numbers indicated a stronger association between pleasant words and white stimuli (i.e., a positive *D* indicated an automatic preference for the color white/white products; a negative *D* indicated an automatic preference for the color black/black products).

Results

Consistent with H1a, participants have an automatic preference for the color white over black irrespective of race (Mean$D_{combined\ sample}$ = .49; Mean$D_{Caucasian\text{-}American\ sample}$ =.68; Mean$D_{African\text{-}American\ sample}$ = .23) (see Fig. 1). In support of H1b, we observe an automatic preference for white over black-colored products for the total sample (Mean$D_{combined\ sample}$ = .34), and within each racial group (Mean$D_{Caucasian\text{-}American\ sample}$ = .48; Mean$D_{African\text{-}American\ sample}$ = .17). Finally, a regression of participants' product IAT scores on their color IAT scores shows that automatic color preference predicted automatic product preference for the total sample (β = .46), for Caucasian-Americans (β = .28), and for African-Americans (β = .43), thereby supporting H2a (see Table 1).

Study 2

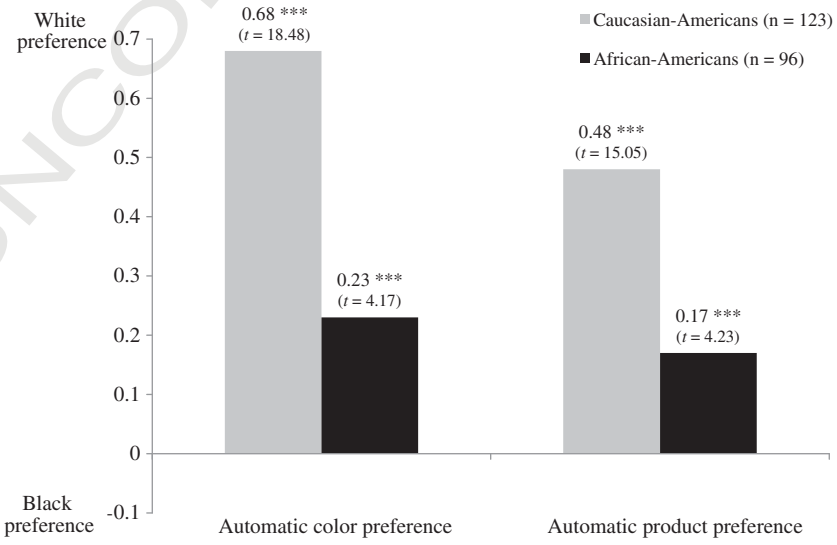
Study 1 documented that individuals, irrespective of race, exhibit automatic preferences for the color white and for white products. Study 2 extends our understanding of the impact of automatic color preference, by (1) examining the relationship between automatic (the color IAT) and explicit (self-report) color preferences, and by (2) investigating the behavioral predictive ability of these two types of measures on actual product choice.

Procedures

Undergraduate students (N = 426; 70.7% Caucasian-American, 2.4% African-American, 18.4% Asian/Asian-American, 3.9% Hispanic, .5% Native-American/Alaska Native, 4.1% other races/ethnicities) participated in a lab study. A white pen and a black pen (otherwise identical) were placed on each study table, and participants selected their preferred pen as "a gift for their participation" via the computer screen (left/right position of white/black-colored pens and screen pictures of pens were counterbalanced).

Explicit attitude toward the colors white and black was the average of seven (7-point) semantic differential items (e.g., "In general, I think the color white (black) is … Good/Bad, Pleasant/Unpleasant, Beautiful/Ugly"; white: α = .88; black: α = .88). We derived a relative explicit preference for the color white as compared to the color black by subtracting the explicit attitude for black from the explicit attitude for white. Finally, participants completed a color and a product IAT (order counterbalanced). Participants received their pen selection at the session's end.

All IAT procedures and calculation of preference measures were identical to Study 1. Thirteen participants were excluded from further analysis based on the exclusion criteria outlined in Study 1, resulting in 413 participants (M_{age} = 21 years).



Note: *** Mean*D* scores > 0, $p < .001$.

Fig. 1. IAT Mean*D* scores (Study 1). Note: ***Mean*D* scores > 0, $p < .001$.

Please cite this article as: Kareklas, I., et al., Judgment is not color blind: The impact of automatic color preference on product and advertising preferences, *Journal of Consumer Psychology* (2013), http://dx.doi.org/10.1016/j.jcps.2013.09.005

Table 1
Effects of automatic color preference (Studies 1 and 3).

Predictor variable: Automatic color preference	Criterion variable: Automatic product preference (Study 1) β	F	df	Automatic racial preference (Study 3) β	F	df	Automatic advertisement preference (Study 3) β	F	df
Combined sample	.46***	59.67	(1, 217)	.37***	52.56	(1, 324)	.30***	31.41	(1, 324)
Caucasian-American sample	.28**	10.16	(1, 121)	.35***	34.89	(1, 243)	.21**	11.14	(1, 243)
African-American sample	.43***	21.18	(1, 94)	.23*	4.30	(1, 79)	.29*	7.04	(1, 79)

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Results

Consistent with H1a and H1b respectively, participants exhibit automatic preferences for the color white over black (Mean$D$ = .48; $t(412) = 25.06$, $p < .001$) and for white over black-colored products (Mean$D$ = .47; $t(412) = 23.63$, $p < .001$). Further, a comparison of each mean with the scale neutral mid-point of 4 documents a positive explicit attitude in favor of both the colors white ($M = 3.12$; $t(412) = 17.40$, $p < .001$) and black ($M = 2.73$; $t(412) = 26.57$, $p < .001$) and the difference between these means is statistically significant ($t(412) = 6.27$, $p < .001$). In support of H2a and H2b, automatic color preference is correlated with automatic product preference ($r = .42$, $p < .001$) (H2a) and with explicit preference for the color white over black ($r = .21$, $p < .001$) (H2b).

Our results indicate that a greater percentage of participants chose the black pen (69.25%) over the white pen (30.75%; $\chi^2 = 61.21$, $p < .001$). We then conducted a series of logistic regression analyses to test the effects of automatic color preference and explicit color preference on pen choice (see Table 2). In separate reduced model analyses we find that both automatic color preference ($B = 1.15$) and explicit color preference ($B = .66$) are significant predictors of pen choice (H2c). Also, when we included automatic and explicit color preferences in the same (full model) logistic regression, we found significant simultaneous effects of automatic color preference ($B = .90$) and explicit color preference ($B = .63$) on pen choice, a result that affirms that these measures explain different portions of the variance in choice (H3a). Further analyses of the differences in −2 log likelihood between the reduced and full models affirm that the full model is a better predictor of choice than the reduced models (both differences, $\chi^2 > 7$, $p < .01$), supporting H3b. Hence, prediction accuracy is improved when automatic and explicit measures are used concurrently.

To summarize, although participants exhibited an automatic preference for the color white over black, we observe a greater percentage of participants choosing the black versus the white pen. Notably, despite this divergence between actual pen choice and automatic color preference, our results indicate that automatic color preference is a significant predictor of individual choice not only by itself, but also after accounting for favorable explicit attitudes toward the colors black and white. In other words, while at the aggregate level black pens were chosen more often than white pens, individual level behavioral choices were proportional to respondents' strength of automatic preference for the color white over black. These results are consistent with past findings that document actual choices are driven by implicit and explicit cognitive processes, as well as social norms and practical considerations (Gibson, 2008), and may be a function of product color familiarity and typicality.

Study 3

Study 3 focuses on automatic color preference in relation to automatic racial preference and automatic preference for advertisements featuring African-American or Caucasian-American spokespeople, to understand the role of automatic color preference in explaining race-based discrepancies in automatic preference for one's race.

Procedures

Study 3 includes three IATs (see Appendix A): a color IAT, a race IAT (six Caucasian-American and six African-American faces; from Smith-McLallen et al., 2006), and an advertisement IAT (12 ads representing combinations of race (African-American, Caucasian-American) by sport (basketball, tennis,

Table 2
Binary logistic regression results (Study 2).

Predictor variable(s)	Criterion variable: Pen choice B	SE	Wald(1)	Exp(B)
Reduced model 1				
Automatic color preference	1.15***	.31	13.97	3.16
	(−2 log likelihood = 494.41)			
Reduced model 2				
Explicit color preference	.66***	.11	36.34	1.94
	(−2 log likelihood = 463.02)			
Full model				
Automatic color preference	.90**	.33	7.58	2.46
Explicit color preference	.63***	.11	31.75	1.87
	(−2 log likelihood = 455.07)			

** $p < .01$.
*** $p < .001$.

Please cite this article as: Kareklas, I., et al., Judgment is not color blind: The impact of automatic color preference on product and advertising preferences, *Journal of Consumer Psychology* (2013), http://dx.doi.org/10.1016/j.jcps.2013.09.005

weightlifting) by brand (Etonic, New Balance); from Brunel et al., 2004). Consistent with Brunel et al. (2004), automatic advertisement preference was based on the combined-classification measurement blocks in which participants were asked to classify words as pleasant or unpleasant and ads as featuring a Caucasian-American or an African-American spokesperson. IAT procedures and analyses were consistent with Study 1.

Of the 403 undergraduate students recruited to participate, 35 were eliminated from further analysis because they did not self-identify as Caucasian-American or African-American, and 42 based on the exclusion criteria outlined in Study 1. Thus, analyses are based on 245 Caucasian-Americans and 81 African-Americans (M_{age} = 22 years).

Results

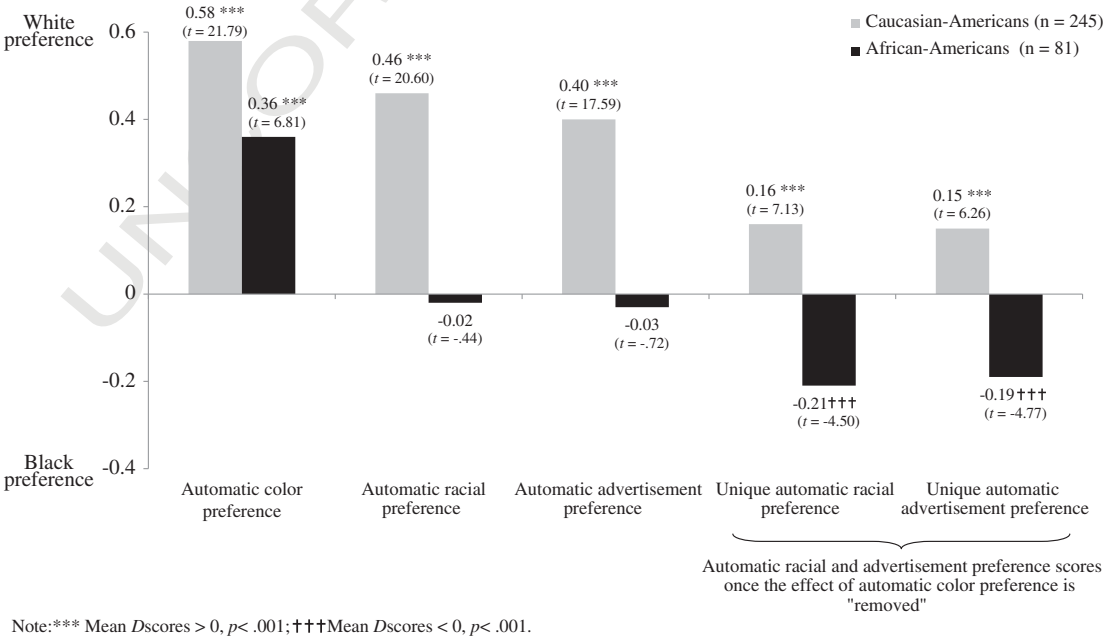
In support of H1a, we find an automatic color preference for the color white over black (Mean$D_{combined\ sample}$ = .53; Mean$D_{Caucasian\text{-}American\ sample}$ = .58; Mean$D_{African\text{-}American\ sample}$ = .36; see Fig. 2). Consistent with past research using implicit measures, Caucasian-Americans exhibit a pro-Caucasian automatic racial preference (Mean$D_{Caucasian\text{-}American\ sample}$ =.46), whereas African-Americans do not exhibit a significant automatic racial preference in favor of their own race (Mean$D_{African\text{-}American\ sample}$ = −.02). Similarly, Caucasian-Americans exhibit a preference for ads featuring Caucasian-American spokespeople (Mean$D_{Caucasian\text{-}American\ sample}$ =.40), whereas African-Americans do not prefer ads featuring African-American spokespeople (Mean$D_{African\text{-}American\ sample}$ = −.03).

To test H4a, we regressed automatic racial preference on automatic color preference; consistent with expectations, we find a significant positive effect (β = .37; see Table 1). Similarly, we regressed automatic advertisement preference on automatic color preference, and consistent with H4b, we find a significant effect (β = .30). Additional analyses indicate that automatic racial preference significantly predicts automatic advertisement preference ($F(1, 324) = 162.12$, β = .58, $p < .001$), and that automatic racial preference mediates the effect of automatic color preference on automatic advertisement preference (Sobel z = 6.09; $p < .001$). These results hold not only for the full sample, but also for Caucasian-Americans and African-Americans.

To test H5, we first regressed automatic racial preference on automatic color preference, and saved each participant's unstandardized regression residual (i.e., portion of automatic racial preference not explained by automatic color preference), which we refer to as *unique automatic racial preference*. Similarly, we regressed automatic advertisement preference on automatic color preference, saving the unstandardized regression residual, which we refer to as *unique automatic advertisement preference*. Consistent with H5a (see Fig. 2), analysis of these residuals reveals a unique automatic racial preference in favor of participants' own race for *both* Caucasian-Americans (Mean = .16) and African-Americans (Mean = −.21). Further, we found a unique automatic advertisement preference for ads depicting spokespeople of their own race (H5b) for Caucasian-Americans (Mean = .15) and African-Americans (Mean = −.19).

Discussion

Our research highlights consumers' automatic color preferences, and provides validating and unique insights regarding their effects on consumer psychology in product and advertising



Note:*** Mean *D*scores > 0, $p < .001$; ††† Mean *D*scores < 0, $p < .001$.

Fig. 2. IAT Mean*D* scores (Study 3). Note: ***Mean*D* scores > 0, $p < .001$; †††Mean*D* scores < 0, $p < .001$.

Please cite this article as: Kareklas, I., et al., Judgment is not color blind: The impact of automatic color preference on product and advertising preferences, *Journal of Consumer Psychology* (2013), http://dx.doi.org/10.1016/j.jcps.2013.09.005

evaluation contexts. Across three studies, we document an automatic preference for the color white over black, and show that this preference predicts preferences for white over black-colored products (Studies 1 and 2) and for advertisements featuring Caucasian-American versus African-American spokespeople (Study 3). Importantly, we demonstrate that automatic preference for the color white is a predictor of choice even when black-colored products are chosen by a majority of individuals, and that choice prediction is improved when using automatic and explicit color preference measures in tandem (Study 2). Our work helps to reconcile disparate advertising and psychology literature findings when using implicit versus explicit measures with African-American participants. Importantly, our studies draw attention to the need to disentangle the terms "white" and "black" as designation of colors versus racial groups.

Theoretical and managerial implications

Our research makes three important theoretical contributions. First, we provide an increased understanding of color effects in consumer psychology. Our findings affirm consistent automatic color preference effects across multiple studies and consumer groups. Thus, the automatic effects of the colors white and black are largely shared and impact attitudes and behaviors in a predictable manner (Elliot et al., 2007).

Second, we offer a theoretically grounded explanation related to automatic color preference for past inconsistent findings regarding preferences for members of one's race, and empirically document that automatic color preference is intrinsically embedded in automatic racial and advertisement preferences. After accounting for automatic color preference, both African-Americans and Caucasian-Americans exhibit comparable preferences in favor of members from their respective race, consistent with in-group favoritism theory (Tajfel et al., 1971). This indicates that past research documenting a lack of automatic in-group favoritism among African-Americans is due, in part, to automatic pro-white color preferences masking in-group preferences. Our explanation based on color preference shares some similarities with the underlying learning mechanisms advanced in system justification theory (Jost & Banaji, 1994), as we have suggested that the socialization of color symbolism may lead individuals of both races to internalize positive associations with the color white and negative associations with the color black.

Third and relatedly, our results are supportive of color symbolism theory (Duckitt et al., 1999) as the underlying explanation of automatic color preference. Although individuals of both races should have similar early experiences with light and darkness, we find that Caucasian-Americans exhibit a stronger automatic preference for the color white than African-Americans (see Figs. 1 and 2). We speculate that the weaker automatic pro-white color preference among African-Americans could be the result of the joint exposure/learning of positive American cultural associations with the color white (e.g., "white knight") and unique subcultural references such as "the darker the flesh, the deeper the roots," thereby weakening the automatic preference for the color white. Therefore, early experience theory (Williams & Morland, 1976) cannot be the sole driver of pro-white color preference.

Marketing managers who are designing or advertising white and black products or developing advertisements with Caucasian-Americans and African-Americans must be attuned to consumers' automatic color preference. Our results underscore how consumers' non-conscious associations related to the words black and white might activate or reinforce racial associations. Using the terms "Caucasian-Americans" and "African-Americans" when referring to racial groups and avoiding color-based racial labels is important, because co-mingling of meanings when using the words white and black as both color and racial designations can lead to misleading conclusions and measurement problems, and can reinforce racial prejudices given that consumers tend to exhibit automatic pro-white color preferences.

Future research

Our research provides the impetus for several streams of work. First, our work focused on the automatic preference for white versus black products, in categories where both are available and equally desirable. Consistent with our findings, white/white-pearl has been the dominant color for vehicles in North America since 2007 (DuPont, 2011). However, in other countries other colors are preferred, as colors may carry different meanings and lead to varying responses depending on social and cultural contexts (Elliot et al., 2007). Extending research on the automatic preferences of other colors is likely to yield additional insights into consumption practices and choices; for example, Elliot et al. (2007) showed that red connotes danger and adversely impacts performance, whereas green is linked to approach behavior and positively affects performance.

Additional work might investigate dynamic changes in color preference. In contemporary fashion, the color black is often associated with style, elegance, and trendiness; it would be interesting to understand how the repeated exposure to these overt cultural and contextual meaning shifts might weaken the automatic preference for white over time. Assessment of the generalizability of our findings to other cultures where the color white might have negative connotations (e.g., used as funeral color), or where the terms white and black are not comingled with racial designations is warranted. Finding weaker automatic white-color preferences in cultures where white has negative connotations would lend further support to color symbolism theory as the basis for automatic color preference. In contrast, finding comparable automatic white-color preferences in these cultures would lend support to early experience theory.

Second, our color preference studies focused on an array of products (e.g., cars, shoes, pens), brands, and sports; yet, opportunities exist to examine automatic color effects in more versus less constrained decision contexts. For example, we know that explicit responses are controllable and require cognitive

Please cite this article as: Kareklas, I., et al., Judgment is not color blind: The impact of automatic color preference on product and advertising preferences, *Journal of Consumer Psychology* (2013), http://dx.doi.org/10.1016/j.jcps.2013.09.005

resources, whereas implicit measures are characterized by reduced controllability and high efficiency of processing (Nosek, 2007). Thus, we would expect the predictive ability of explicit color preference to decrease, and the predictive ability of explicit color preference to increase, when cognitive resources are limited, for example during impulse purchase decisions (Hofmann, Rauch, & Gawronski, 2007).

Third, further exploration of the interactive effects of using a predominant white/black background in advertisements or product displays could provide useful insights. Building on our findings and research on the auto-motive model of motivation theory (Bargh, 1990), we expect that using white or black as a background color might act as a prime and influence motivations below consciousness to approach or avoid objects. We expect that at an individual level, the impact of this non-conscious process will be proportional to the strength of automatic color preference.

Fourth, research documents that racial identification moderates preference for ads featuring in-group models (Whittler & Spira, 2002). However, extant studies have relied exclusively on explicit measures, which might lead to response biases in socially sensitive research contexts (Ashburn-Nardo et al., 2003). Using a racial identification IAT by incorporating pictures of African-Americans or Caucasian-Americans as racial stimuli, and pronouns to represent *self* (e.g., "me," "us") and *other* (e.g., "you," "them") as evaluative stimuli might offer interesting insights, while circumventing response biases.

To conclude, our work establishes the importance of automatic color preference in consumer psychology, and many opportunities exist to address provocative questions, grounded in the interactive effects of automatic preference related to colors, different-race models, and targeted groups based on race. By drawing upon theories of automatic color preference, research on color and psychological functioning (Elliot et al., 2007), and in-group favoritism (Tajfel et al., 1971), additional contributions will broaden our understanding of the effects of color on the attitudes and behaviors of different racial groups in the consumption domain.

Uncited reference Q7

Williams, 1969

Appendix A. Examples of stimuli used in Studies 1, 2, and 3

Note: Stimuli were presented at a resolution of approximately 300 × 300 pixels on gray background (RGB code: 127 127 127). An equal number of women and men in similar poses from each racial group were depicted in the race and advertisement IATs.

Color IAT (Studies 1, 2 & 3)	Product IAT (Studies 1 & 2)	Pen Choice (Study 2)	Race IAT (Study 3)	Advertisement IAT (Study 3)
				
				

References

Adams, F. M., & Osgood, C. E. (1973). A cross-cultural study of the affective meanings of color. *Journal of Cross-Cultural Psychology*, *4*(2), 135–156.

Ashburn-Nardo, L., Knowles, M. L., & Monteith, M. J. (2003). Black Americans' implicit racial associations and their implications for intergroup judgment. *Social Cognition*, *21*(1), 61–87.

Aslam, M. M. (2006). Are you selling the right colour? A cross-cultural review of colour as a marketing cue. *Journal of Marketing Communications*, *12*(1), 15–30.

Bargh, J. A. (1990). Auto-motives: Preconscious determinants of social interaction. In E. T. Higgins, & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition*, *Vol. 2*. (pp. 99–130)New York: Guilford.

Bellizzi, J. A., Crowley, A. E., & Hasty, R. W. (1983). The effects of color in store design. *Journal of Retailing*, *59*(1), 21–45.

Boswell, D. A., & Williams, J. E. (1975). Correlates of race and color bias among preschool children. *Psychological Reports*, *36*(1), 147–154.

Brunel, F. F., Tietje, B. C., & Greenwald, A. G. (2004). Is the Implicit Association Test a valid and valuable measure of implicit consumer social cognition? *Journal of Consumer Psychology*, *14*(4), 385–404.

De Bock, T., Pandelaere, M., & Van Kenhove, P. (2013). When colors backfire: The impact of color cues on moral judgment. *Journal of Consumer Psychology*, *23*(3), 341–348.

Duckitt, J., Wall, C., & Pokroy, B. (1999). Color bias and racial preference in White South African preschool children. *Journal of Genetic Psychology*, *160*(2), 143–154.

DuPont (2011). DuPont global automotive color popularity report. from. http://www2.dupont.com/Automotive/en_US/news_events/article20111117.html

Elliot, A. J., Maier, M. A., Moller, A. C., Friedman, R., & Meinhardt, J. (2007). Color and psychological functioning: The effect of red on performance attainment. *Journal of Experimental Psychology*, *136*(1), 154–168.

Frank, M. G., & Gilovich, T. (1988). The dark side of self- and social perception: Black uniforms and aggression in professional sports. *Journal of Personality and Social Psychology*, *54*(1), 74–85.

Gibson, B. (2008). Can evaluative conditioning change attitudes toward mature brands? New evidence from the Implicit Association Test. *Journal of Consumer Research*, *35*(1), 178–188.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, *102*(1), 4–27.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, *74*(6), 1464–1480.

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*(2), 197–216.

Greenwald, A. G., Poehlman, T. A., Uhlmann, E. L., & Banaji, M. R. (2009). Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity. *Journal of Personality and Social Psychology*, *97*(1), 17–41.

Hofmann, W., Rauch, W., & Gawronski, B. (2007). And deplete us not into temptation: Automatic attitudes, dietary restraint, and self-regulatory resources as determinants of eating behavior. *Journal of Experimental Social Psychology*, *43*, 497–504.

Jost, J. T., & Banaji, M. R. (1994). The role of stereotyping in system-justification and the production of false consciousness. *British Journal of Social Psychology*, *33*(1), 1–27.

Lee, S., & Barnes, J. H. (1989). Using color preferences in magazine advertising. *Journal of Advertising Research*, *29*(6), 25–30.

Longshore, D. (1979). Color connotations and racial attitudes. *Journal of Black Studies*, *10*(2), 183–197.

Madden, T. J., Hewett, K., & Roth, M. S. (2000). Managing images in different cultures: A cross-national study of color meanings and preferences. *Journal of International Marketing*, *8*(4), 90–107.

Maison, D., Greenwald, A. G., & Bruin, R. H. (2004). Predictive validity of the Implicit Association Test in studies of brands, consumer attitudes, and behavior. *Journal of Consumer Psychology*, *14*(4), 405–415.

Mead, M., & Baldwin, J. (1971). *A rap on race.* New York: J.B. Lippincott.

Mehta, R., & Zhu, R. J. (2009). Blue or red? Exploring the effect of color on cognitive task performances. *Science*, *323*(5918), 1226–1229.

Neto, F., & Paiva, L. (1998). Color and racial attitudes in white, black and biracial children. *Social Behavior and Personality*, *26*(3), 233–244.

Nosek, B. A. (2007). Implicit–explicit relations. *Current Directions in Psychological Science*, *16*, 65–69.

Nosek, B. A., Banaji, M., & Greenwald, A. G. (2002). Harvesting implicit group attitudes and beliefs from a demonstration web site. *Group Dynamics: Theory, Research, and Practice*, *6*(1), 101–115.

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2005). Understanding and using the Implicit Association Test: II. Method variables and construct validity. *Personality and Social Psychology Bulletin*, *31*(2), 166–180.

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The Implicit Association Test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Social psychology and the unconscious: The automaticity of higher mental processes* (pp. 265–292). : Psychology Press.

Rudman, L. A., Feinberg, J., & Fairchild, K. (2002). Minority members' implicit attitudes: Automatic ingroup bias as a function of group status. *Social Cognition*, *20*(4), 294–320.

Schlinger, M. J., & Plummer, J. T. (1972). Advertising in black and white. *Journal of Marketing Research*, *9*(2), 149–153.

Simpson, E. M., Snuggs, T., Christiansen, T., & Simples, K. E. (2000). Race, homophily, and purchase intentions and the Black consumer. *Psychology & Marketing*, *17*(10), 877–889.

Smith-McLallen, A., Johnson, B. T., Dovidio, J. F., & Pearson, A. R. (2006). Black and white: The role of color bias in implicit race bias. *Social Cognition*, *24*(1), 46–73.

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, *1*(2), 149–178.

Whittler, T. E. (1991). The effects of actors' race in commercial advertising: Review and extension. *Journal of Advertising*, *20*(1), 54–60.

Whittler, T. E., & Spira, J. S. (2002). Model's race: A peripheral cue in advertising messages? *Journal of Consumer Psychology*, *12*(4), 291–301.

Williams, J. E. (1969). Individual differences in color–name connotations as related to measures of racial attitude. *Perceptual and Motor Skills*, *29*(2), 383–386.

Williams, J. E., Boswell, D. A., & Best, D. L. (1975). Evaluative responses of preschool children to the colors white and black. *Child Development*, *46*(2), 501–508.

Williams, J. E., & Morland, J. K. (1976). *Race, color, and the young child.* Chapel Hill: University of North Carolina Press.

Williams, J. E., & Rousseau, C. A. (1971). Evaluation and identification responses of Negro preschoolers to the colors black and white. *Perceptual and Motor Skills*, *33*(2), 587–599.

Williams, J. E., Tucker, R. D., & Dunham, F. Y. (1971). Changes in the connotations of color names among Negroes and Caucasians: 1963–1969. *Journal of Personality and Social Psychology*, *19*(2), 222–228.

Please cite this article as: Kareklas, I., et al., Judgment is not color blind: The impact of automatic color preference on product and advertising preferences, *Journal of Consumer Psychology* (2013), http://dx.doi.org/10.1016/j.jcps.2013.09.005