Reports

The independent effects of skin tone and facial features on Whites' affective reactions to Blacks

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ABSTRACT

Research on skin tone and Afrocentric features provides evidence that people use phenotypes (visible physical characteristics) to make inferences about the degree to which stereotypes about the racial group apply to the individual (i.e., to make impressions of others). However, skin tone and Afrocentric features have been confounded in prior research on this topic. The present study examines whether facial features (lip thickness, nose width) have effects on Whites' affective reactions to Black targets, above and beyond the well-documented skin tone effect by experimentally crossing variation in facial features and skin tone. The results showed that both skin tone and facial features independently affected how negatively, as opposed to positively, Whites felt toward Blacks using both implicit and explicit measures. The findings that Whites reacted more negatively toward Blacks with darker skin tone and more prototypical facial features than toward Blacks with lighter skin tone and less prototypical facial features on the explicit measure may indicate that Whites are unaware of the negative effects that Blacks' phenotypes can have on their racial attitudes. The present study demonstrated that subtle facial features, in addition to salient skin tone, also play an important role when predicting Whites' feelings about Blacks. One implication is that it is important to raise people's awareness about the effects that Blacks' phenotypes can have on their attitudes.

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Introduction

The process of interracial impression formation often starts with categorization of a target into a racial group based on visible physical characteristics, known as phenotypes (Brewer, 1988; Fiske, Lin, & Neuberg, 1999). This is because individuals in the same racial group often share similar phenotypes and people have mental representations of how individuals in certain racial groups should look (Kunda, 1999). Once a target is categorized into a specific racial group, people may form their impressions of that person based on their attitudes toward the racial group (Brewer, 1988; Fiske et al., 1999).

However, even within the same racial groups there is variation in phenotypes. Research of skin tone has consistently shown that darker-skinned Blacks are perceived, evaluated, and treated more negatively than lighter-skinned Blacks by both Whites and Blacks (Anderson & Cromwell, 1977; Averhart & Bigler, 1997; Dixon & Maddox, 2005; Hall, 1992, 2003, 2005; Maddox & Chase, 2004; Maddox & Gray, 2002; Wade, Romano, & Blue, 2004). Research of Afrocentric features has also shown that facial features, such as fuller lips, wider nose, and coarse hair, in addition to darker skin, negatively

influence Whites' reactions to Blacks (Blair, 2006; Blair, Chapleau, & Judd, 2005; Blair, Judd, & Fallman, 2004; Blair, Judd, Sadler, & Jenkins, 2002; Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006; Eberhardt, Goff, Purdie, & Davies, 2004; Livingston & Brewer, 2002). However, in the prior research, skin tone and facial features have been confounded. The present study aims to examine the independent effects of these phenotypes by experimentally crossing variation in facial features and skin tone.

The skin tone effect

Skin tone (i.e., lightness/darkness of skin color) strongly influences how Blacks are perceived and treated by others. For example, Maddox and Gray (2002) asked White and Black participants to report cultural beliefs about Blacks with different skin tone. Participants listed a greater number of negative than positive attributes for darker-skinned Blacks, whereas they listed a greater number of positive than negative attributes for lighter-skinned Blacks. As another example, Wade et al. (2004) had White participants review job application materials ostensibly completed by Black applicants. Participants were more willing to accept lighter-skinned Black applicants than darker-skinned counterparts, regardless of applicant gender.

Differential treatment of Blacks based on their skin tone is further reflected in Blacks' self-reports of experiences with discrimination. Klonoff and Landrine (2000) found that dark-skinned Blacks reported experiencing discrimination 11 times more often and appraised their

experiences with discrimination as more stressful, as compared to light-skinned Blacks. These studies provide strong evidence that people perceive and react more negatively to dark-skinned Blacks than to light-skinned Blacks.

The Afrocentric features effect

Although skin tone is often considered the most salient phenotype that defines race in the US (Brown, Ward, Lightbourn, & Jackson, 1999; Hall, 1998), facial features also play a role in racial categorization (Feldman, 2010; King, 1981; Phinney, 1996). Blacks vary on a constellation of phenotypes, including nose and lip width, eye color and hair type, as well as skin tone. Afrocentric features refer to all these phenotypes combined (Blair et al., 2002; Livingston & Brewer, 2002).

People often use Afrocentric features when making inferences about individual Blacks. Blair et al. (2005, 2002) have demonstrated that White participants rated Black faces with stronger Afrocentric features as being more likely to commit Black stereotypical behaviors. This effect appears to be robust and efficient because it occurred even when the task is made difficult by introducing cognitive load (Blair, Judd, & Fallman, 2004) or by changing the orientation of faces (Blair, 2006).

Additionally, Blacks with stronger Afrocentric features are evaluated (Livingston & Brewer, 2002) and treated (Eberhardt et al., 2006) more negatively than those with weaker Afrocentric features. For example, Blair, Judd, and Chapleau (2004) found that inmates with stronger Afrocentric features received harsher sentences than inmates with weaker Afrocentric features, regardless of inmate race. Thus, research has shown that Blacks with stronger Afrocentric features are perceived, evaluated, and treated more negatively than Blacks with weaker Afrocentric features.

Disentangling the effects of skin tone and facial features

Research on Afrocentric features appears to suggest that facial features, in addition to skin tone, can have robust effects on Whites' reactions to Blacks. However, skin tone and facial features have been confounded in this prior research. Thus, it is unclear whether effects that have been attributed to Afrocentric features are driven by facial features, skin tone, or both. A common way of determining the degree of Afrocentric features has been to ask participants to provide ratings of the Afrocentricity of a set of faces. In defining "Afrocentricity," past research has typically included skin tone, along with facial features (Blair et al., 2002; Livingston & Brewer, 2002). Although participants are usually told to attend to all available phenotypes when making judgments, whether participants actually follow (or the degree to which they can follow) these instructions is not tested. Because skin tone likely catches participants' eyes before other phenotypes, participants may rate Afrocentricity solely or largely by skin tone.

Some may argue that the effect of skin tone and facial features should not be separated because these phenotypes naturally covary. However, we argue otherwise for several reasons. First, if the effects of Afrocentric features reported previously are due to skin tone, then researchers are simply reinventing the wheel and calling skin tone "Afrocentric features." More importantly, skin tone and facial features do not covary perfectly. Our pilot study has shown that objectively calculated skin tone and subjectively rated Afrocentric features are only moderately correlated ($r = -.42$). Thus, it is reasonable to expect dark-skinned Blacks with less prototypical facial features or light-skinned Blacks with more prototypical facial features.

Furthermore, there is relatively strong evidence in cognitive psychology showing that skin pigmentation (which includes skin tone) and face shape (which includes facial features) have different effects on face perception and recognition (Russell, Biederman, Nederhouser, & Sinha, 2007; Russell & Sinha, 2007; Russell, Sinha, Biederman, & Nederhouser, 2006). Several other studies have shown that interracial face perception/recognition is often less holistic than intra-racial

perception/recognition (Michel, Caldara, & Rossion, 2006; Michel, Rossion, Han, Chung, & Caldara, 2006), suggesting that people may use multiple phenotypes independently when processing other-race faces. Indeed, skin tone and facial features were found to have different neural responses in interracial face perception (Balas & Nelson, 2010; Brebner, Krigolson, Handy, Quadflieg, & Turk, 2011).

Finally, there are debates over which phenotypes play more important roles when defining race. Some researchers argue that people use skin tone over facial features (Brown et al., 1999), some researchers argue that people use facial features over skin tone (Deregowski, Ellis, & Shepherd, 1975; Gitter & Satow, 1969; Sorce, 1979), and others argue that people use both independently (Stepanova & Strube, 2009). These debates concern which phenotypes are used for racial categorizations. However, because the same phenotypes have been used to make inferences about individuals' attributes within the same racial groups, these debates should also be applied to impression formation.

Stepanova and Strube (2012) took the first step in providing evidence that skin tone and facial features have independent effects on impression formation. These researchers created six avatars that were based on the same initial face but that varied in their skin tone (dark versus light) and facial features (high Afrocentric, low Afrocentric, Eurocentric). By factorially combining these two variables, they showed that both influence people's affective reactions to Blacks and that the effects were additive, not interactive.

The current study

The present study represents a critical next step in examining whether facial features influence how Whites react to Blacks above and beyond the skin tone effect. Stepanova and Strube's (2012) work suggests that both factors are important, but their work has some key limitations specifically concerning the nature of their target faces. As mentioned, they created six target faces that manipulated skin tone and facial features starting from a single computer generated image. Having only a single artificial base face limits the generalizability of their findings, and perhaps more importantly may have provided participants sufficient information to speculate on the purpose of the studies. For example, when participants saw two faces that were identical except for skin tone, some might have guessed that they were supposed to react to these faces differently. In contrast, the present study used a large number of pictures of authentic faces as base images, which increases generalizability of results and reduces demand characteristics. In addition, this study employed both implicit and explicit measures to assess Whites' affective reactions to Blacks' skin tone and facial features. Finally, the current study was designed to capture the direction of changes in affective reactions by distinguishing between negative and positive evaluations of Black targets.

In this study, faces with fuller lips and wider nose are referred as having "more prototypical facial features," and faces with thinner lips and narrower nose are referred as having "less prototypical facial features." To separate the effects of facial features from skin tone without jeopardizing the ecological validity of target faces, we experimentally manipulated Black targets' lips and nose while keeping skin tone constant, and created four target groups: dark-skinned/more prototypical facial features (DM); dark-skinned/less prototypical facial features (DL); light-skinned/more prototypical facial features (LM); and light-skinned/less prototypical facial features (LL).

Creation of target stimuli

We created four target groups that systematically differed in skin tone and facial features using four steps. In Step 1, we created a pool of 120 pictures of Black men with neutral facial expressions, collected from university athletic websites and the Productive Aging Lab Face Database (Minear & Park, 2004). All pictures were in a standard head-and-shoulder format, with no visible accessories, and were edited

using Adobe PhotoShop CS3 to have a solid gray background and a plain black t-shirt. Then, face width, face length, nose width, and lip thickness were measured for each face. Next, the ratios of nose width (nose width÷face width) and lip thickness (lip thickness÷face length) were computed. Skin tone was also assessed for each face by averaging the luminosity value for each pixel across a given face. Additionally, 14 White participants categorized each face into Black, White, or "Racially ambiguous," and 190 White participants rated the pictures on attractiveness. We ensured that the final set of pictures were all unambiguously "Black" with the same degree of attractiveness.

In Step 2, we created four target groups (DM, DL, LM, LL). First, we selected the 20 most dark-skinned and 20 most light-skinned pictures based on luminosity. Next, we manipulated the lips and nose of the 40 faces to create more and less prototypical versions of each face. To create a face that was more prototypical, the nose and lips from a given face were digitally altered to equal the nose and lip ratios found at 1 SD above the mean. To create a face that was less prototypical, the nose and lips of a given face were altered to reflect the nose and lip ratios found at 1 SD below the mean. Thus, for each of the 20 dark-skinned faces we created a more and less prototypical version; similarly, for each of the 20 light-skinned faces we created a more and less prototypical version.

In Step 3, we tested whether the manipulation of facial features was successful. We digitally transformed the 80 pictures from Step 2 into outline pictures (i.e., no skin tone) and asked 58 participants to look at them one by one and indicate how prototypical each of the young men in the pictures was in terms of "African Americanness." Participants were told that judgments of African American prototypicality entails facial features (e.g., lip thickness, nose width), hair texture, and so on. These instructions were similar to the ones in Livingston and Brewer's (2002) study, except that "skin tone" was excluded from the instructions. Participants were also asked to rate the "naturalness" of the outline pictures. Specifically, they were told "the pictures had been transformed into outlined pictures from their original colored pictures, and that some parts of the face in a small number of pictures have been digitally altered." Pictures that were perceived to be unnatural were excluded from the pool.

In Step 4, we selected 32 more prototypical and 32 less prototypical versions of faces (16 dark-skinned and 16 light-skinned) whose facial features had been successfully manipulated, yielding a final set of 64 pictures. Analysis revealed that the selection of dark- vs. light-skinned pictures based on luminosity was successful; pictures in the dark-skin-tone condition had significantly lower luminosity ($M=.23$, $SD=.03$) than those in the light-skin-tone condition ($M=.49$, $SD=.05$), $t(30)=-18.23$, $p<.001$, $d=6.31$. These two sets of pictures did not differ in attractiveness ($M=.23$, $SD=.03$ and $M=.23$, $SD=.03$ for the dark- and light-skin-tone condition, respectively), $t(30)=-.03$, $p=.35$. Additionally, faces that were manipulated to have fuller lips and a wider nose were rated as more prototypical facial features ($M=3.91$, $SD=.61$) than the faces that were manipulated to have thinner lips and a narrower nose ($M=3.24$, $SD=.67$), even when there was no skin tone information, $t(57)=13.10$, $p<.001$, $d=1.05$. Thus, the manipulation of facial features independent of skin tone was successful, allowing us to assess whether facial features, independent from skin tone, influence how Whites react to Blacks. Finally, the 64 pictures were divided into two sets because participants could not be exposed to both more and less prototypical versions of the same face. See Fig. 1 for examples of the actual stimuli used in the study.

Methods

Participants

Participants were 196 self-identified White undergraduates who received partial course credit for their participation (due to a computer malfunction, age and gender were not recorded).[1] Ten participants (5.2%) were excluded from the analyses (nine who mentioned "skin color/skin tone" when asked about the purpose of the study, one who did not pay attention during the task), resulting in 186 analyzable cases.

Procedures

Up to six participants reported to each laboratory session. Participants were informed that the study examined memory and judgment skills and told that their task was to complete a number of short computer tasks. Participants first completed a sequential priming task, which assessed automatic affective reactions to Black targets. Then, they completed a measure of self-reported liking toward the targets. Participants were randomly assigned to one of the two stimuli sets, each of which consisted of 40 target faces (eight from each of the four target groups plus eight control White faces).

Measures

Automatic affective reactions

A Sequential Priming Task (SPT; see Fazio, Jackson, Dunton, & Williams, 1995) was used to assess participants' automatic affective reactions to the targets. In the current study, there were four target (DM, DL, LM, LL) and one control (White men; WM) groups. Faster latencies to negative words following a particular picture (i.e., prime), relative to a no-prime baseline latency, indicate more negative affective reactions to that prime, and faster latencies to positive words following a particular prime indicate more positive affective reactions to that prime.

The task consisted of four phases, including a baseline phase, two filler phases, and the key experimental phase. In the baseline phase task, participants were instructed to judge whether a word presented on the computer screen was good or bad as quickly and accurately as possible. Words were eight positive words (beauty, joy, love, paradise, romance, smile, success, vacation) and eight negative words (cockroach, despair, disgust, garbage, pest, poison, sewage, vomit). The purpose of this phase was to obtain baseline latency for the words that would then be used as target words in the fourth phase. First, a fixation point "*********" appeared on the screen for 315 ms. Then, one of the 16 words was randomly presented on the screen until participants responded. The next trial started with a 2.5 s inter-trial interval. Response latency for each word was recorded in milliseconds. Participants completed two blocks of trials. Latencies from the two trials were averaged within each word and served as the baseline latencies.

The two filler tasks provided a cover story for why participants were presented with primes and why they needed to attend to those faces in the experimental phase of the study (see Fazio et al., 1995 for more information). Finally, the experimental task involved the actual priming procedure. The instructions and procedures were the same as the baseline phase with two exceptions. First, the fixation point was replaced by a prime picture from one of the four target and one control groups. Second, participants were told to attend to the faces because there would be a subsequent face-recognition task (which they did not complete).

Explicit liking

Participants were asked to look at each of the same target pictures they saw during the SPT (except control White faces[2]) and indicate
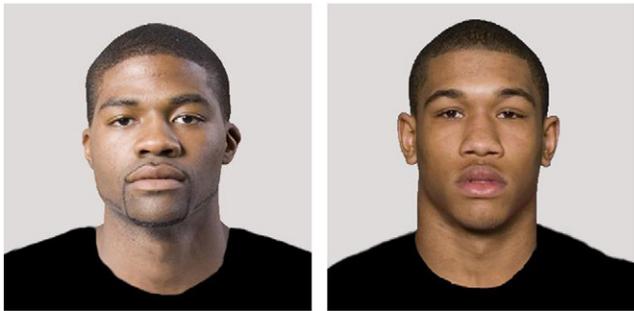
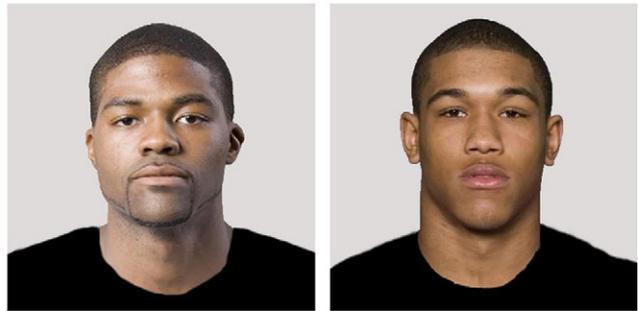Dark-skinned/More prototypical facial features (DM)   Dark-skinned/Less prototypical facial features (DL)

Light-skinned/More prototypical facial features (LM)   Light-skinned/Less prototypical facial features (LL)

Fig. 1. Examples of the actual stimuli that were used in the study. Four faces with more prototypical facial features were taken from one set, and four faces with less prototypical facial features were taken from another set. Thus, no participant was exposed to both more and less prototypical versions of the same face. The entire target stimuli used in the study are available upon request to the corresponding author.

how much they thought they would like the person. The scale ranged from 0 (I would DISLIKE this person very much) to 5 (I would LIKE this person very much).

Computing facilitation scores

Facilitation scores were computed separately for positive and negative words instead of computing difference scores because positive and negative affect are often considered as separate constructs (Diener & Emmons, 1984; Goldstein & Strube, 1994; Warr, Barter, & Brownbridge, 1983; Watson, Clark, & Tellegen, 1988). Additionally, separate analysis of positive and negative words allows us to examine the direction of the change in attitudes (e.g., increase in negativity vs. decrease in positivity).

First, incorrect trials and response latencies <300 ms and >2.5 SDs above the individual's mean were deleted. Then the log-transformed latency for any given word following a given prime was subtracted from the log-transformed baseline latency for that word to arrive at a facilitation score. Thus, positive values indicate that responses to the word are facilitated compared with baseline, and negative values indicate that responses to the word are slowed compared with baseline. Next, mean facilitation scores for positive and negative words were computed for each picture (each picture was followed by 2 positive and 2 negative words). Then, mean facilitation scores for positive words were averaged across the eight pictures within the four target and one control groups. Mean facilitation scores for negative words were also averaged across the eight pictures within the five groups. Thus, 10 facilitation scores were computed for each participant. Higher facilitation scores for negative words suggest more automatic negative feelings toward preceding target groups. Higher facilitation scores for positive words suggest more automatic positive feelings toward preceding target groups.

Results

Automatic negative affective reactions

The means and standard deviations for each target group in both raw and log-transformed scores are presented in Table 1. A three-factor mixed model ANOVA, treating skin tone (dark, light) and facial features (more prototypical, less prototypical) as within-participants factors and stimuli set (set 1, set 2) as a between-participants factor, was computed on the facilitation scores for negative words. The main effect of skin tone was significant, $F(1, 184) = 6.65$, $MSE = .01$, $p = .01$, $d = .07$, such that participants responded faster to negative words following dark-skinned Blacks ($M = 37.76$, $SD = 70.11$) than to light-skinned Blacks ($M = 32.64$, $SD = 74.34$). The main effect of facial features was also significant, $F(1, 184) = 4.15$, $MSE = .002$, $p < .05$, $d = .06$, such that participants responded faster to negative words following Blacks with more prototypical facial features ($M = 37.23$, $SD = 71.54$) that Blacks with less prototypical facial features ($M = 33.17$, $SD = 72.90$). The interaction between skin tone and facial features was not significant, $F(1, 184) = .04$, $MSE = .002$, $p = .85$.

Table 1
Means and standard deviations of facilitation scores for the negative words as a function of Black Americans' skin tone and facial features.

		Dark skin tone		Light skin tone		White
		Facial feature prototypicality		Facial feature prototypicality		
		High	Low	High	Low	
Raw score (ms)	M	39.75	35.77	34.70	30.57	25.48
	(SD)	(69.24)	(70.97)	(73.84)	(74.83)	(72.12)
Log transformed score	M	.082	.074	.072	.065	.058
	(SD)	(.106)	(.107)	(.113)	(.112)	(.108)

There were no main effects or interactions with stimuli set. These results suggest that there are independent effects of facial features and skin tone and that the effects are additive.

Automatic positive affective reactions

Table 2 presents the means and standard deviations for each target group. A three-factor mixed model ANOVA revealed that none of the main effects of skin tone [$F(1, 184) = 2.60$, $MSE = .002$, $p = .11$], facial features [$F(1, 184) = .25$, $MSE = .001$, $p = .62$], or prime set [$F(1, 184) = .40$, $MSE = .04$, $p = .53$] was significant. Likewise, the interaction between skin tone and facial features was not significant, $F(1, 184) = 2.15$, $MSE = .003$, $p = .14$, and there were no interactions with stimuli set. Thus, there is no evidence that automatic positive affective reactions are affected by skin tone or facial features.

Black vs. White targets

A follow-up analysis was conducted to examine whether automatic affective reactions to Black targets are different from reactions to White targets. Facilitation scores for Black targets were averaged across the four target groups. A two-factor mixed model ANOVA on facilitation scores for negative words, treating target race as within-participants factor and stimuli set as between-participants factor, revealed that the main effect of target race was significant, $F(1, 184) = 11.78$, $MSE = .002$, $p < .001$, $d = .14$. Participants responded faster to negative words following Blacks ($M = 35.20$, $SD = 66.87$) than Whites ($M = 25.48$, $SD = 72.12$), indicating that they reacted more negatively toward Blacks. There was no main effect of stimuli set, $F(1, 184) = .10$, $MSE = .02$, $p = .75$. The same analysis was conducted on facilitation scores for positive words and revealed no significant main effects of target race [$F(1, 184) = .02$, $MSE = .002$, $p = .89$] or stimuli set [$F(1, 184) = .48$, $MSE = .02$, $p = .49$]. These results indicate that negativity toward Blacks reflects increased negativity rather than decreased positivity.

Explicit liking

The means and standard deviations for each target group are presented in Table 3. A three-factor mixed model ANOVA revealed that the main effect of skin tone was significant, $F(1, 184) = 36.68$, $MSE = .08$, $p < .001$, $d = .18$. Participants thought that they would like lighter-skinned Blacks ($M = 3.12$, $SD = .73$) more than dark-skinned Blacks ($M = 2.99$, $SD = .70$). The main effect of facial features was also significant, $F(1, 184) = 13.56$, $MSE = .06$, $p < .001$, $d = .10$. Participants thought they would like Blacks with less prototypical facial features ($M = 3.09$, $SD = .71$) more than those with more prototypical facial features ($M = 3.02$, $SD = .72$). The interaction between skin tone and facial features was not significant, $F(1, 184) = .97$, $MSE = .07$, $p = .33$, and again there were no effects of stimuli set. Note that we could not examine whether these mean differences reflect increased negativity or decreased positivity toward Blacks, because we did not assess explicit attitudes towards the White control group. However, the overall

Table 3
Means and standard deviations of White Americans' explicit liking toward Black Americans as a function of skin tone and facial features.

	Dark skin tone		Light skin tone	
	Facial features prototypicality		Facial features prototypicality	
	High	Low	High	Low
M	2.97	3.01	3.03	3.16
SD	.70	.70	.74	.71

pattern of results for explicit liking was consistent with that for automatic affective reactions.

Discussion

This study examined whether facial features, above and beyond skin tone, influence how Whites react affectively to Blacks using a large number of authentic target pictures and both implicit and explicit measures. The results showed that Whites reacted more negatively toward darker-skinned Blacks than toward lighter-skinned Blacks. The results also showed that Whites reacted more negatively toward Blacks with thicker lips and a wider nose (more prototypical facial features) than those with thinner lips and a narrower nose (less prototypical facial features). These results were found with not only an explicit measure of liking but also an implicit measure, suggesting that Whites can detect and react to such subtle differences in facial features in a very limited time (i.e., 315 ms). More importantly, the effects of skin tone and facial features were additive for both implicitly and explicitly measured attitudes. Thus, the present study demonstrated that the independent effects of skin tone and facial features reported by Stepanova and Strube (2012) can be conceptually replicated with more naturally varying target faces and different affective measures. Because skin tone and facial features do not always covary, the findings highlight the importance of looking at them separately.

Interestingly, there was no significant difference in how positively Whites reacted to Blacks as a function of skin tone or facial features. These results suggest that the previously reported findings that Blacks with darker skin and stronger Afrocentric features were perceived and treated more negatively (e.g., Blair, 2006; Maddox & Chase, 2004) may be attributed to increased negative perceptions of such individuals, rather than decreased positive perceptions of them or increased positive perceptions of Blacks with lighter skin and weaker Afrocentric features.

The present study also provides an important insight into Whites' awareness about the negative effects that Blacks' phenotypes can have on their attitudes. Because blatant, "old-fashioned" racism has become socially unacceptable and explicit measures are sensitive to social desirability concerns (Crandall, Eshleman, & O'Brien, 2002; Dowden & Robinson, 1993; Gaertner & Dovidio, 1986), one would expect that Whites would be motivated to control their responses to all Black targets at least on explicit measures. We argue that the skin tone and facial features differences found for the explicit measure may reflect a lack of awareness on the part of White perceivers about the impact that Blacks' phenotypes has on their affective reactions. Awareness is one of the important first steps in reducing prejudice and discrimination (see Monteith & Mark, 2005 for review). The findings from the present study could be used for informing and educating people about the factors that automatically influence their attitudes and behaviors toward Blacks.

Limitations and future directions

Although the current study provides important insights into the relationship between Blacks' phenotypes and Whites' affective

Table 2
Means and standard deviations of facilitation scores for the positive words as a function of Black Americans' skin tone and facial features.

		Dark skin tone		Light skin tone		White
		Facial feature prototypicality		Facial feature prototypicality		
		High	Low	High	Low	
Raw Score (msec)	M	26.21	20.36	17.93	19.90	21.27
	(SD)	(63.39)	(66.39)	(69.20)	(67.40)	(68.51)
Log Transformed Score	M	.059	.052	.048	.052	.052
	(SD)	(.106)	(.108)	(.111)	(.110)	(.113)

reactions, it is not without limitations. According to social dominance theory, arbitrary-set social hierarchy mainly concerns the control of subordinate men by coalitions of dominant men (e.g., Pratto, Sidanius, & Levin, 2006; Sidanius & Pratto, 1999). Thus, the nature of negative racial attitudes may change depending on gender of the perceivers. In this study, due to a programming oversight, we did not measure participants' gender. Thus, we could not evaluate whether White men and women responded differently to Black men. Relatedly, future studies should also examine the role of target gender. Existing studies have exclusively focused on Black men as targets, and to date no Afrocentric features research has used Black women as targets. Gender differences have been reported in skin tone research (Coard, Breland, & Raskin, 2001; Hill, 2002; Ross, 1997; Thompson & Keith, 2001; Wade & Bielitz, 2005; Wade et al., 2004), thus the effects of facial features also may be different for Black men and women. Additionally, as already stated above, social dominance theory predicts target gender differences in racial bias.

Another limitation is that we cannot know with certainty that the strength of the manipulation for facial features was equivalent to the magnitude of the skin tone difference. Our explicit attitude results clearly suggest that skin tone had a stronger impact than facial features, but this may either reflect the relative importance of skin tone or methodological limitations in the manipulation. Facial features were manipulated to reflect 1 *SD* above and below the mean, so that the more-prototypical-facial-features and less-prototypical-facial-features conditions were exactly 2 *SD*s apart. In contrast, the selection of skin tone conditions was based on darkest vs. lightest skin tones in the original picture pool. Indeed, the average luminosity in the dark-skin-tone condition was −1.30 and that for the light-skin-tone condition was 1.64, suggesting that the two conditions were about 3 *SD*s apart. In future research, it will be important to equate the strength of the skin tone and facial features manipulations.

It is also important to examine the independent effects of skin tone and facial features from Black perceivers' perspectives. How people perceive and evaluate individuals from different social groups is often different from how people perceive and evaluate individuals from their own group. Thus, how Blacks feel about fellow ingroup members with different levels of skin tone and facial features may be different from how Whites feel about Black targets.

Finally, future research should assess skin tone and facial features at more than two levels (i.e., dark-vs.-light, more-vs.-less). Given that previous studies, along with this study, have always employed 2×2 or 2×3 designs, the nature of the skin tone and facial features effects on Whites' affective reactions Blacks is still unclear (e.g., linear vs. curvilinear). One way to address this is to simply have White participants react to actual Black faces (with no manipulation), and then correlate their reactions to objectively assessed luminosity and lip and nose ratios.

Conclusion

The present study demonstrated that there are independent, additive effects of skin tone and facial features on Whites' affective reactions to Blacks using both implicit and explicit measures. Specifically, skin tone and facial features affect how negatively, as opposed to positively, Whites feel toward Blacks. Thus, subtle facial features are informative and important when predicting White individuals' feelings about Blacks. Because Whites reacted more negatively to Blacks with darker skin and more prototypical facial features, as compared to Blacks with lighter skin and less prototypical facial features, even on the explicit measure, they are likely to be unaware of the negative effects that Blacks' phenotypes can have on their racial attitudes.

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