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Facial Structure Is Indicative of Explicit Support for Prejudicial Beliefs

Eric Hehman, Jordan B. Leitner, Matthew P. Deegan, and Samuel L. Gaertner
University of Delaware

Abstract

We present three studies examining whether male facial width-to-height ratio (fWHR) is correlated with racial prejudice and whether observers are sensitive to fWHR when assessing prejudice in other people. Our results indicate that males with a greater fWHR are more likely to explicitly endorse racially prejudicial beliefs, though fWHR was unrelated to implicit bias. Participants evaluated targets with a greater fWHR as more likely to be prejudiced and accurately evaluated the degree to which targets reported prejudicial attitudes. Finally, compared with majority-group members, racial-minority participants reported greater motivation to accurately evaluate prejudice. This motivation mediated the relationship between minority- or majority-group membership and the accuracy of evaluations of prejudice, which indicates that motivation augments sensitivity to fWHR. Together, the results of these three studies demonstrate that fWHR is a reliable indicator of explicitly endorsed racial prejudice and that observers can use fWHR to accurately assess another person's explicit prejudice.

Keywords

face perception, bizygomatic width, intergroup dynamics, prejudice, impression formation

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Recent research has revealed that individuals are surprisingly accurate at inferring diverse characteristics from faces; for example, when presented with target faces, they can accurately infer the targets' reproductive fitness (Rhodes et al., 2001), religion (Rule, Garrett, & Ambady, 2010), criminal tendencies (Valla, Ceci, & Williams, 2011), upper-body strength (Sell et al., 2009), and sexual orientation (Rule, Ambady, Adams, & Macrae, 2008). Various facial characteristics and cultural cues convey these attributes, but the present research focused on males' facial width-to-height ratio (fWHR) and how it relates to racial prejudice.

fWHR and Testosterone

The fWHR is calculated as a face's bizygomatic width (i.e., the distance between the left and right zygions, or cheekbones) divided by the upper facial height (i.e., the distance between the upper lip and the midbrow). This ratio is independent of body weight, and some evidence indicates that male and female fWHRs diverge at puberty (Weston, Friday, & Lio, 2007), though the relationship between gender and fWHR may vary by ethnicity (Özener, 2012). Cranial growth in human males is related to the amount of testosterone present during adolescence (Verdonck, Gaethofs, Carels, & de Zegher, 1999), and testosterone levels are associated with ratings of facial masculinity (Pound, Penton-Voak, & Surridge, 2009); these findings are evidence that fWHR is a visible manifestation of testosterone exposure.

Accordingly, recent work has suggested that fWHR is associated with testosterone-related behaviors. For example, males with a greater fWHR were more likely to steal points (Carré & McCormick, 2008) and exploit other players (Stirrat & Perrett, 2010) during a computerized game, and hockey players with a greater fWHR spent more time in the penalty box (Carré & McCormick, 2008). These findings have led researchers to speculate that a greater fWHR is indicative of increased aggression and may make men appear more physically imposing, thereby reducing the likelihood that they will experience retribution for their aggressive actions (Stirrat & Perrett, 2010).

Recent reviews, however, have called into question the idea that aggression is the most accurate expression of testosterone levels, as testosterone also influences a wide variety of nonaggressive behaviors (Eisenegger, Haushofer, & Fehr, 2011). In addition, animal models have shown that testosterone has a

Corresponding Author:
Eric Hehman, Department of Psychological and Brain Sciences, Dartmouth College, 6207 Moore Hall, Hanover, NH 03755
E-mail: eric.hehman@dartmouth.edu

greater effect on social displays of aggression, such as territorial and dominance aggression, than nonsocial displays of aggression, such as predatory and antipredatory aggression (Wingfield, Lynn, & Soma, 2001). Consequently, it may be more accurate to say that testosterone promotes the search for and maintenance of social dominance (Eisenegger et al., 2011). Therefore, to the extent that a greater fWHR is associated with increased testosterone, fWHR may be a physical manifestation of dominance motives in males and may be best described as an inclination toward interpersonal social dominance and related behaviors.

One behavior related to social dominance is decreased social conformity. Higher-status males (Fard, 2010) and males whose testosterone-related mating motives have been primed (Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006) are less likely to conform to group norms, and nonconformity can be interpreted as a behavioral display of dominance (Kenrick, Neuberg, Griskevicius, Becker, & Schaller, 2010). Furthermore, neurological findings have shown that high testosterone levels are associated with reduced activity in the orbitofrontal cortex, an area used in impulse control and inhibition (Mehta & Beer, 2009). Thus, inasmuch as fWHR reflects social-dominance motives, a greater fWHR may correspond with decreased inhibition and conformity to social norms.

fWHR in Intergroup Settings

This characterization of testosterone, dominance, and fWHR leads to several novel hypotheses. First, a greater fWHR might be associated with decreased inhibition of expressing prejudice. In modern society, it is unacceptable to express negative sentiments toward minority groups, and researchers typically encounter difficulties when measuring self-reported attitudes sensitive to social desirability (Dienstbier, 1970). However, males with a greater fWHR might be more likely to report prejudicial beliefs, should they exist, because these males are less inhibited than other people by societal pressures to appear nonprejudiced.

Additionally, males with a greater fWHR might be perceived by other people as more likely to be prejudiced. Previous work has demonstrated that observers are sensitive to fWHR and rate targets with a greater fWHR as less trustworthy (Stirrat & Perrett, 2010) and more aggressive (Carré, McCormick, & Mondloch, 2009). Moreover, an additional study indicated that these perceptions were specifically due to fWHR, rather than other facial characteristics (e.g., brow ridge, chin; Carré, Morrissey, Mondloch, & McCormick, 2010). To the extent that fWHR is indicative of an individual's capacity for dominance, people may want to avoid males with a high fWHR in potentially competitive contexts. Previous work has examined perceptions of fWHR exclusively within own-race contexts; participants evaluated and interacted with targets who were members of their racial in-group. However, in intergroup contexts, males with a greater fWHR might be evaluated as more likely to be competitive or more likely to be prejudiced. Note that this perception might be largely accurate, in view of testosterone's associations with decreased inhibition and increased social-dominance motivations (Eisenegger et al., 2011; Mehta & Beer, 2009).

The Current Research

Building on this theoretical framework, we expected males with a greater fWHR to report more prejudice as a result of decreased susceptibility to societal pressure to appear nonprejudiced. Accordingly, we also hypothesized that males with a greater fWHR would report less external motivation to appear nonprejudiced. Furthermore, we speculated that observers would expect males with a greater fWHR to behave more aggressively and dominantly. Thus, we hypothesized that in intergroup contexts, observers would evaluate males with greater fWHR as more likely to be prejudiced. These predictions suggest that observers may be able to accurately evaluate the degree of prejudice self-reported by targets simply by viewing static images of the targets' faces.

We tested these predictions in three studies. In Study 1, we examined whether targets' fWHR was associated with their self-reported racial prejudice and their external motivation to appear nonprejudiced. In Study 2, we assessed whether participants were sensitive to fWHR when evaluating targets' degree of prejudice and whether these evaluations were accurate. Finally, in Study 3, we compared the ability of minority- and majority-group members to evaluate targets' prejudicial beliefs and examined how participants' motivation affected the accuracy of their evaluations.

Study 1: fWHR and Measures of Bias

In Study 1, participants completed a variety of measures and posed for photos of their faces; the fWHRs of the faces in the photos were measured. We hypothesized that males with a greater fWHR would admit to more racial prejudice. To test this prediction, we asked participants to complete measures of explicit and implicit racial bias. Explicit biases are self-reported, consciously endorsed beliefs. In the current work, we assessed explicit biases with the Attitudes Toward Blacks Scale (Brigham, 1993) because of its frequent use in prejudice research. This scale has been used to demonstrate relationships between explicit racial bias and behaviors ranging from verbal bias during intergroup interactions (Dovidio, Kawakami, & Gaertner, 2002) to political support for U.S. president Barack Obama (Hehman, Gaertner, & Dovidio, 2010). Implicit biases, in contrast, influence behaviors that are less under conscious control, such as nonverbal gestures or facial expressions during interracial interactions (Dovidio et al., 2002). Such behaviors are thought to be generated by learned, automatic associations between a valence (e.g., good) and one category (e.g., Whites) rather than another (e.g., Blacks; Gaertner & McLaughlin, 1983).

We examined the relationships between fWHR and both explicit and implicit bias to gain insight into the psychological mechanisms driving the potential relationship between fWHR and prejudice. On the basis of the notion that males with a greater fWHR feel less societal pressure to appear nonprejudiced, and thus are more likely to report explicit bias should they endorse such attitudes, we hypothesized that a greater fWHR would be related to more explicit bias. However, we did not anticipate finding a relationship between fWHR and implicit bias because implicit bias is largely unaffected by motivations to appear nonprejudiced (Greenwald, Nosek, & Banaji, 2003).

We also postulated that decreased inhibition (Mehta & Beer, 2009) and decreased susceptibility to pressures to adhere to societal norms (Fard, 2010) might explain why males with a greater fWHR express more prejudice. To assess these mechanisms in the intergroup domain, we asked participants to report their external motivations to appear nonprejudiced (Plant & Devine, 1998).

Method

Participants were 70 White males who had completed the Attitudes Toward Blacks Scale (Brigham, 1993) and the External Motivation to Respond Without Prejudice Scale (EMS; Plant & Devine, 1998) in pretesting 2 weeks prior to the study. The Attitudes Toward Blacks Scale is an explicit-bias measure that includes 20 questions (e.g., "If a Black were put in charge of me, I would not mind taking advice and direction from him or her," "I would rather not have Blacks live in the same apartment building I live in"; the second example was reverse-scored). Ratings were made on a scale from 1, *strongly disagree*, to 5, *strongly agree* ($\alpha = .81$). The EMS consists of 5 items (e.g., "If I acted prejudiced toward Black people, I would be concerned that others would be angry with me," "I try to act nonprejudiced toward Black people because of pressure from others"). Ratings were made on a scale from 1, *strongly disagree*, to 9, *strongly agree* ($\alpha = .82$).

Implicit bias was measured during the experimental session using an Implicit Association Test, which was scored as recommended by Greenwald et al. (2003). For this test, stimuli consisting of six White faces, six Black faces, six "good" adjectives (e.g., *rainbow*, *joy*), and six "bad" adjectives (e.g., *cancer*, *vomit*) were presented in random order. By virtue of their assignment to response keys, stimuli were paired into either stereotype-incongruent associations (African American faces and good adjectives, European American faces and bad adjectives) or stereotype-congruent associations (African American faces and bad adjectives, European American faces and good adjectives). Thus, in some trial blocks, participants were instructed to press one key on a response pad when a Black face or negative word was presented and another key when a White face or positive word was presented. In other blocks, the associations were reversed; participants were asked to press one key for Black faces and positive words and another key for White faces and negative words. The order of presentation of these blocks was counterbalanced. Higher scores indicate greater in-group bias.

After participants completed the Implicit Association Test, they were instructed to maintain a neutral expression and look directly at a camera while a White experimenter took a photo of their face. Three coders, who were blind to our hypotheses, measured the fWHR of each photographed face, following the procedure used in previous studies (Carré & McCormick, 2008; Carré et al., 2009; Stirrat & Perrett, 2010). Specifically, the bizygomatic width (i.e., left zygion to right zygion) of the face was divided by the upper facial height (i.e., the distance from the upper lip to the midbrow) to determine fWHR (Fig. 1). Measured fWHRs were highly consistent across coders ($\alpha = .87$), and the three measurements for each photo were averaged.

Results

We evaluated the relationships between our variables of interest by deriving coefficients from 5,000 bootstrap estimates to create bias-corrected confidence intervals (CIs). Our primary hypothesis was that higher fWHR would be associated with increased explicit racial prejudice. We therefore regressed fWHR on implicit- and explicit-bias scores simultaneously. Participants with greater fWHRs did report significantly more explicit racially prejudiced beliefs, $b = 0.024$, 95% CI = [0.010, 0.050], partial $r(67) = .211$. However, fWHR was not related to implicit bias, $b = -0.017$, 95% CI = [−0.120, 0.050], partial $r(67) = -.038$.

Our secondary hypothesis was that males with a greater fWHR would be less inhibited by societal pressure to conform and thus would report less external motivation to respond without prejudice. Support for this hypothesis was demonstrated by a negative correlation between fWHR and EMS score, $r(55) = -.295$, 95% CI = [−5.690, −.330].[1] Males with a greater fWHR reported lower levels of external motivation to appear nonprejudiced. Taken together, these results indicate

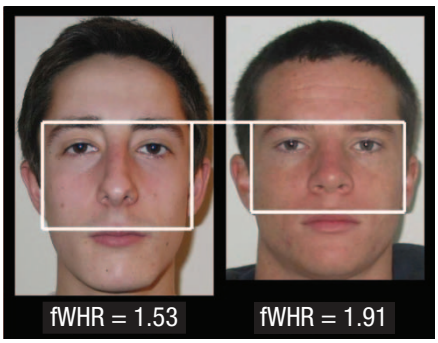

Fig. 1. Photos of participants in Study 1. The example on the left shows a person with a low facial width-to-height ratio (fWHR), and the example on the right shows a person with a high fWHR. The white rectangles indicate the measurements taken to calculate fWHR (i.e., left zygion to right zygion, upper lip to midbrow).

that, perhaps because of decreased susceptibility to societal pressures to appear nonprejudiced, males with a greater fWHR were more likely to admit that they harbored prejudicial beliefs but were not more likely to be implicitly biased against Blacks. EMS scores were not related to explicit bias, a matter we return to in the General Discussion.

Study 2: fWHR and Evaluations of Prejudice

Study 1 demonstrated that fWHR was associated with participants' explicitly reported biases but not with their implicit biases. Although this relationship is academically intriguing, fWHR would play a limited role in intergroup interactions if it were not a perceptible signal of prejudicial beliefs. Therefore, our two subsequent studies focused on how other people perceived and utilized a target's fWHR to evaluate the target's degree of prejudice. Drawing from previous work demonstrating observers' sensitivity to fWHR when making context-dependent evaluations (Carré et al., 2009; Stirrat & Perrett, 2010), we hypothesized that participants would use a target's fWHR as a proxy for the target's degree of prejudice, such that a greater fWHR would result in an evaluation of greater prejudice. To examine whether fWHR facilitates accurate evaluations of explicit racial prejudice, we asked participants in Study 2 to view the photos of the participants in Study 1 (the targets) and estimate their bias; we then compared these estimates with the self-reported bias of the targets.

Method

Target selection. The 70 White male participants in Study 1 were divided into quartiles according to their explicit racial prejudice. Five targets were randomly selected from each quartile (high, moderately high, moderately low, and low), for a total of 20 targets.

Participants and procedure. Participants were 102 White undergraduates (28 males, 74 females), who received partial course credit in exchange for their participation. They viewed the photos of the 20 targets in random order and evaluated the targets' degree of prejudice by answering the question, "How racist do you think this person is?" using a 6-point scale (1 = *not at all*, 6 = *extremely*). To encourage honest rather than strategic responses, we told participants that targets were randomly selected from a large database and that every target had an equal likelihood of scoring low or high on prejudice. Participants who reported knowing any targets (n = 1) were removed from analysis.

Results

Data were analyzed using hierarchical linear modeling. Because participants made repeated evaluations of 20 targets, data were interdependent within participants. Hierarchical linear modeling accounts for such shared variance and generates parameter estimates less biased than those from an analysis of variance; coefficients can be interpreted similarly to unstandardized beta weights. Participants were treated as random, with multiple target evaluations nested within participants. In one model, we examined the relationship between participants' evaluations of the targets' prejudice and the targets' fWHR, and in a second model, we examined the relationship between participants' evaluations of the targets' prejudice and the targets' self-reported prejudice. Interactions were decomposed using techniques specified by Preacher, Curran, and Bauer (2006).

As we predicted, participants evaluated targets with wider, shorter faces (those with greater fWHRs) as more prejudiced (γ_{10} = 1.92, SE = 0.20, $p < .001$); thus, participants were sensitive to fWHR when evaluating targets' prejudice[2] (Fig. 2). Additionally, participants' evaluations of targets' prejudice were related to the targets' self-reported prejudice (γ_{10} = 0.38, SE = 0.04, $p < .001$). In other words, participants were able to accurately estimate a target's self-reported prejudicial beliefs simply by looking at a static image of the target's face.

Study 3: fWHR and Motivated Evaluations of Prejudice

Study 2 suggested that White, majority-group members are sensitive to fWHR when evaluating a target's degree of bias. However, there are several reasons to believe that minority-group members might be more accurate than majority-group members at such a task, and we examined this possibility in Study 3.

Individuals devote attentional resources to stimuli that can affect their fate (Neuberg & Fiske, 1987; Van Bavel, Packer, &

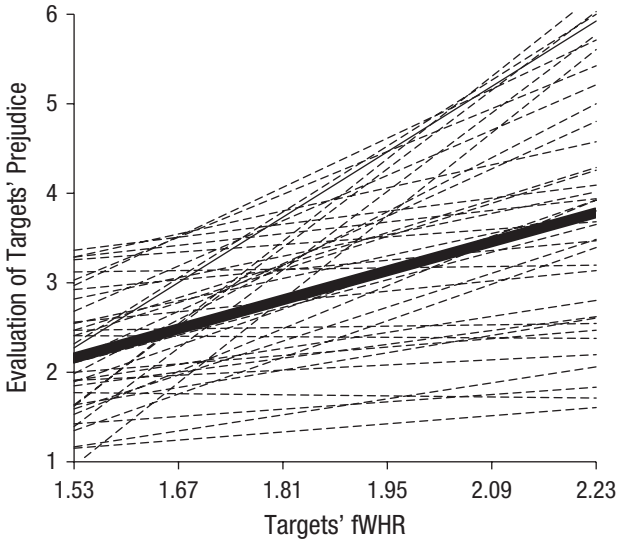

Fig. 2. Results from Study 2: evaluations of targets' prejudice as a function of the targets' facial width-to-height ratio (fWHR). Dashed lines indicate results for individual participants. The solid line indicates the mean relationship across all participants.

Cunningham, 2011). Just as snakes and spiders capture attention (Öhman, Flykt, & Esteves, 2001), so do individuals in positions of power (Shriver & Hugenberg, 2010). In another study, women who rated themselves as less dominant were more sensitive to fWHR when evaluating the trustworthiness of males (Stirrat & Perrett, 2010). Majority-group members have the power to influence the outcomes of minority individuals more frequently than minority-group members can influence the outcomes of majority-group individuals. It would therefore be advantageous for minority individuals to avoid contact with majority-group members who might negatively influence their outcomes through racial or ethnic discrimination.

Furthermore, perceptual sensitivity can increase or decrease as a function of the context. For instance, in a previous study, participants who were subjected to an experience of social rejection were more accurate at judging whether smiles were real or fake, compared with participants who were not subjected to such an experience (Bernstein, Young, Brown, Sacco, & Claypool, 2008). Given that minorities are more at risk for having important outcomes determined by their race or ethnicity, they may be more sensitive than majority-group members to the potential prejudice of other people. In Study 3, we therefore directly compared majority- and minority-group members' ability to accurately detect prejudice. To examine motivation as a possible mechanism underlying the ability to evaluate targets' prejudice, we measured how motivated participants were to be accurate. We expected that minority-group members would outperform majority-group members in evaluating a target's prejudice, and that motivation would mediate the relationship between group membership and accuracy.

Finally, previous research has found that assessments of warmth, competence (Fiske, Cuddy, & Glick, 2007; Todorov, Mandisodza, Goren, & Hall, 2005), and attractiveness (Lorenzo, Biesanz, & Human, 2010) are important in impression formation, and we believed it would be valuable to determine whether fWHR influenced evaluations of prejudice even when we controlled for these other factors. Therefore, participants in Study 3 also evaluated targets along the dimensions of friendliness (i.e., warmth), intelligence (i.e., competence), and attractiveness.

Method

Participants and design. Participants were 47 undergraduates (21 males, 26 females; 28 White, 19 non-White[3]), who participated in exchange for partial course credit. This study had a two-level (group membership: majority, minority), between-subjects design. Participants evaluated the same photos of faces used in Study 2 with one exception, as a target requested that his photo be removed from the database. This target's photo was replaced by another photo randomly selected from the same explicit-bias quartile.

Procedure. The procedure was identical to that used in Study 2 with the following exceptions: Participants evaluated, in the following order, how prejudiced,[4] attractive, friendly, and intelligent each target appeared. Participants were informed that these four dimensions were independent. After evaluating all targets, participants responded to two measures of motivation: "How hard were you trying to be accurate on this task?" (scale from 1, *not hard at all*, to 7, *extremely hard*) and "How interested are you in knowing the true prejudice level of each target?" (scale from 1, *not interested at all*, to 7, *extremely interested*). Responses to these items were correlated, $r(43) = .393$, 95% CI = [.070, .560], and averaged to create a single motivation factor. As in Study 2, participants who reported knowing any targets ($n = 2$; 1 minority- and 1 majority-group member) were removed from analysis.

Results

Targets with greater fWHRs were again evaluated as more prejudiced ($\gamma_{10} = 2.31$, $SE = 0.30$, $p < .001$), a result that replicated the findings of Study 2. Also as in Study 2, participants' evaluations of prejudice were related to targets' explicit endorsement of racial prejudice ($\gamma_{10} = 0.38$, $SE = 0.06$, $p < .001$). Even when evaluations of other important impression-formation variables—warmth, competence, and attractiveness[5]—were controlled for, the relationship between targets' fWHR and participants' prejudice evaluations ($\gamma_{10} = 1.22$, $SE = 0.23$, $p < .001$) and the relationship between targets' explicit prejudice and participants' prejudice evaluations ($\gamma_{10} = 0.15$, $SE = 0.05$, $p = .004$) remained significant. These results indicate that fWHR contributed accurate information regarding targets' personality characteristics above and beyond the information obtained from these other meaningful impression-formation variables.

We next examined whether minority- and majority-group members differed in their accuracy in detecting targets' explicit prejudice. Group membership did not significantly moderate accuracy ($\gamma_{11} = 0.17$, $SE = 0.13$, $p = .189$). However, an analysis of variance revealed that minority-group members reported greater motivation to be accurate ($M = 5.86$, $SD = 1.04$), compared with majority-group members ($M = 5.11$, $SD = 1.29$), $F(1, 43) = 4.24$, $p = .046$, $d = 0.64$. Accordingly, we examined whether self-reported motivation to be accurate moderated accuracy. Indeed, motivation moderated the relationship between targets' bias and participants' evaluations of targets' prejudice ($\gamma_{11} = 0.08$, $SE = 0.03$, $p = .007$); participants who were more motivated to be accurate were actually more accurate (Fig. 3). Furthermore, Monte Carlo estimates of the indirect effect (Preacher & Selig, 2012) indicated that motivation to be accurate mediated the relationship between minority- or majority-group membership and accuracy, $b = 0.10$, 95% CI = [0.014, 0.226].

General Discussion

Together, these three studies offer several insights about fWHR and prejudice. Study 1 showed that fWHR is a reliable

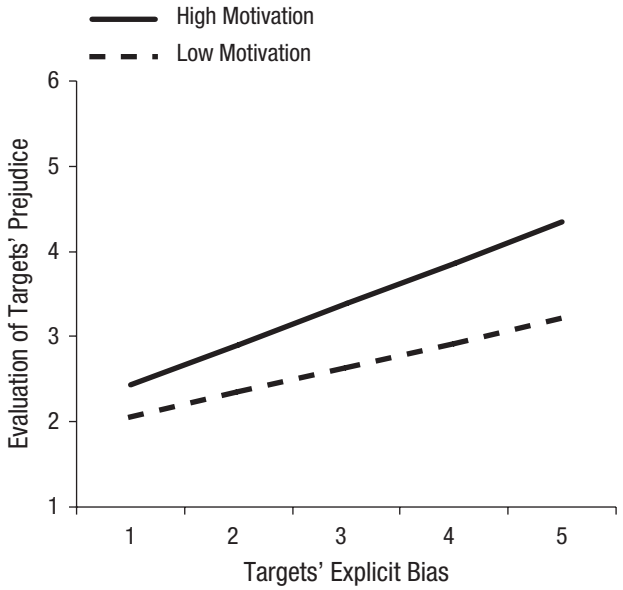

Fig. 3. Results from Study 3: participants' mean rating of targets' prejudice as a function of the targets' explicit bias. Results are shown for participants with high motivation to be accurate (1 *SD* above the mean) and low motivation to be accurate (1 *SD* below the mean). A slope closer to 1 indicates greater accuracy.

indicator of explicitly endorsed racial prejudice but not of implicit prejudice. Studies 2 and 3 showed that targets with greater fWHRs are evaluated as more prejudiced and that observers can accurately evaluate a target's level of endorsed prejudice. Participants were able to accurately evaluate a target's degree of self-reported prejudice simply by looking at a static photograph of the target's face. Finally, Study 3 demonstrated that increased motivation to accurately assess another person's degree of prejudice augments this accuracy. Furthermore, results of Study 3 were consistent with the idea that individuals allocate attentional resources to stimuli that can influence their outcomes (Neuberg & Fiske, 1987; Shriver & Hugenberg, 2010; Van Bavel et al., 2011): Minority individuals, whose outcomes are more likely to be influenced by their race or ethnicity, were more motivated to accurately assess targets' prejudice than were majority-group members. This greater motivation, in turn, was associated with increased accuracy.

It is important to emphasize that the relationship between targets' fWHR and their explicit racial prejudice was relatively small, and it would be erroneous to conclude that testosterone or social dominance equates to racial prejudice. We believe that the consciously endorsed, self-reported nature of explicit prejudice is integral to our results. Dominant, high-testosterone males are less likely than other people to conform (Fard, 2010; Griskevicius et al., 2006), and higher levels of testosterone are associated with decreased inhibition (Mehta & Beer, 2009). When self-reporting on issues sensitive to social desirability, many participants consciously tailor their responses (Dienstbier, 1970). However, males with a greater fWHR may be less inhibited, which would increase their willingness to report any existing racial prejudices. The negative relationship between fWHR and EMS score supports this interpretation. Notably, EMS scores were not related to explicit bias, a finding consistent with Plant and Devine's (2009) conclusion that the EMS predicts an individual's motivation to regulate prejudice better than it predicts an individual's prejudicial attitudes. Given our interests regarding reduced inhibition in prejudice-related domains, we focused on EMS scores, but future work might implement additional attitudinal and behavioral measures to more completely capture the nuances of the relationship between fWHR and explicit prejudice.

Participants were consistently sensitive to fWHR when evaluating a target's degree of prejudice, a finding consistent with research demonstrating that males with a greater fWHR are evaluated more negatively on multiple dimensions (Carré et al., 2009; Stirrat & Perrett, 2010). Notably, participants used fWHR as a proxy for prejudice even though fWHR accounted for only about 4% of the variance in explicit prejudice. This result demonstrates that observers are sensitive to fWHR when forming impressions, even though fWHR is a less-than-perfect predictor of social behavior.

A remaining question is why individuals are sensitive to fWHR when evaluating prejudice. From an evolutionary perspective, it may have been advantageous to identify dominant, high-testosterone males (both in-group and out-group members) because more-dominant males would be more likely to hold leadership positions in one's own group and to behave aggressively. In previous work, researchers have speculated that men with more masculine facial features may have greater access to important resources because they are perceived as physically dominant (Swaddle & Reierson, 2002). Thus, a common underlying construct driving these perceptual effects may be a wariness regarding dominant, high-testosterone males. We speculate that individuals may be sensitive to fWHR when making any evaluations in which dominance may play a role, though further research is needed.

Although the current research indicates that fWHR plays a role in the accurate evaluation of explicitly endorsed racial prejudice, we conducted our studies in controlled settings, and it is unknown what role fWHR plays in intergroup interactions. Previous work found that even a short video clip of a target's subtle nonverbal behaviors during an interracial interaction can be used as a reliable indicator of both self-reported and implicit racial prejudice (Ambady, 2010; Richeson & Shelton, 2005). Another study showed that majority-group members remain unaware of their nonverbal behaviors, and their effects, during interracial interactions (Dovidio et al., 2002). Similarly, interracial interactions could be subtly affected by fWHR, and future work should explore this possibility.

In sum, we have presented evidence of a relationship between physiognomy and an individual's explicitly endorsed racial prejudice. This relationship is notable because racial bias has a well-documented association with important behavioral outcomes (Dovidio et al., 2002; Hehman et al., 2010). The

three studies presented here add to the growing literature regarding the accurate assessment of personality characteristics on the basis of physiognomic measurements, and further highlight the critical role of biology in determining personality characteristics that have broad societal implications.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Notes

1. Because of procedural constraints imposed during pretesting at our university, only 57 of the 70 participants completed the EMS. However, we have no reason to believe the results would have differed if the 13 other participants had been included.
2. This result replicates pilot work indicating that minority participants ($N = 50$) were sensitive to fWHR when forming evaluations of targets. Participants evaluated the targets' degree of prejudice as higher when the targets had higher fWHRs ($\gamma_{10} = 1.25$, $SE = 0.28$, $p < .001$).
3. Minority participants included 9 Hispanics, 7 Blacks, and 3 individuals who self-identified as biracial. Relationships between evaluations of targets' prejudice, targets' fWHR, and targets' self-reported explicit prejudice did not significantly vary among the three minority subgroups.
4. Though targets had specifically reported their attitudes regarding Blacks, participants were unaware of this nuance and were told only to evaluate the targets' (unspecified) racial prejudice.
5. In both models, targets evaluated as more prejudiced were evaluated as less competent ($\gamma_{20} = -0.19$, $p < .01$) and less warm ($\gamma_{30} = -0.42$, $p < .001$), but prejudice evaluations were unrelated to attractiveness.

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