Differentially dangerous? Phenotypic racial stereotypicality increases implicit bias among ingroup and outgroup members

Kimberly Barsamian Kahn,¹ and Paul G. Davies²

Abstract
This article investigates whether within-group differences in perceived phenotypic racial stereotypicality can exacerbate implicit racial stereotyping for Blacks among both ingroup and outgroup members. Two studies with non-Black (Study 1) and Black (Study 2) participants confirmed that high stereotypical (HS) Black targets (i.e., those with darker skin, broader noses and fuller lips) elicited stronger implicit bias in split-second “shoot/don’t shoot” situations than low stereotypical (LS) Black targets or White targets. Specifically, a lower shooting criterion was adopted for HS Black targets, indicating a greater willingness to shoot HS Black targets, resulting in more pronounced bias. Results suggest that the perceived phenotypic racial stereotypicality of Black targets can increase the accessibility of stereotypes linking Blacks with danger, which intensifies racial bias. Further, the article provides the first empirical evidence that stereotypicality biases operate at implicit levels among Blacks when evaluating ingroup members. The implications for stereotypicality research and policing are discussed.

Keywords
racial bias, shooter bias, stereotypes, stereotypicality, within-group variation

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Trust between the races is often tentative. It can wither without a sustaining effort … It can be blown asunder by the news of a police shooting of an unarmed Black or Latino youth. (Obama, 2006, p. 238)

Stereotypes are not equally applied to all group members. While categorization models of stereotyping focus on stereotyping between racial groups (Bodenhausen & Macrae, 1998; Fiske & Neuberg, 1990; Fiske & Taylor, 1991), within-group differences in stereotyping can occur on top of category differences, providing an additional route through which bias may operate. Within-group stereotyping

¹ Department of Psychology, University of California, Los Angeles
² Department of Psychology, University of British Columbia

Corresponding author:
Kimberly Barsamian Kahn, Department of Psychology, University of California, Los Angeles, 1285 Franz Hall, Los Angeles, CA 90095-1563, USA.
[Email: kimkahn@ucla.edu]
often stems from within-group differences in perceived phenotypic racial stereotypicality, or how strongly individuals are perceived to exhibit, display or project the physical features typical of their group. For example, within the same racial group, the most physically stereotypic group members – those deemed to be highly representative of the category – are subjected to greater levels of stereotyping than low stereotypical members. Research has shown that the more stereotypically “Black” that an individual physically appears (i.e., Blacks who possess features such as dark skin, broad nose, and full lips), the more that individual is the target of Black racial stereotypes (Blair, Judd, & Chapleau, 2004; Blair, Judd, & Fallman, 2004; Blair, Judd, Sadler, & Jenkins, 2002; Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006; Eberhardt, Goff, Purdie, & Davies, 2004; Livingston & Brewer, 2002; Maddox, 2004).

High stereotypical Blacks have been shown to receive greater amounts of stereotyping across a variety of domains and situations. For example, Blacks with more stereotypical physical features are thought to possess more stereotypical personality traits (e.g., musical, aggressive) and less counter-stereotypical traits (e.g., intelligent) compared to Blacks with less stereotypical features (Blair et al., 2002, 2004b). Even when relevant diagnostic information is available, perceived stereotypical physical features predict the amount of stereotyping applied to the target (Blair, Chapleau, & Judd, 2005). Within the criminal justice domain, perceived Black stereotypicality influences perceptions of criminality by the police (Eberhardt et al., 2004) and actual criminal sentencing (Blair et al., 2004a), including the likelihood of receiving the death penalty (Eberhardt et al., 2006).

**Stereotypes and shooter bias**

Previous research using a “shoot/don’t shoot” videogame has confirmed that racial stereotypes linking Blacks to danger are responsible – at least partially – for racial bias in decisions to shoot (for review, see Correll, Park, Judd, & Wittenbrink, 2007). In these split-second decision-making situations, participants mistakenly shoot unarmed Blacks more often than unarmed Whites, and mistakenly refrain from shooting armed Whites more often than armed Blacks. This racially biased pattern of responding is termed “shooter bias”, and reflects implicit racial stereotyping (Correll, Park, Judd, & Wittenbrink, 2002; see also Payne, 2001; Greenwald, Oaks, & Hoffman, 2003). It is the accessibility of cultural stereotypes associating Blacks with danger that is believed to cause shooter bias. To illustrate, when potentially threatening targets conform to cultural stereotypes (i.e., armed Blacks, unarmed Whites), participants tend to make correct decisions, but when those cultural stereotypes are reversed (i.e., unarmed Blacks, armed Whites) participants’ decision-making ability is impaired (Correll et al., 2002, 2007). Similarly, increasing the accessibility or awareness of racial stereotypes magnifies shooter bias (Correll et al., 2007).

The current studies examine the possibility that perceived phenotypic racial stereotypicality increases implicit racial stereotyping among both racial outgroup (Study 1, among non-Black evaluators) as well as ingroup members (Study 2, among Black evaluators). Specifically, using the shooter task to assess implicit stereotyping and bias, we measure the effect of the perceived phenotypic racial stereotypicality of potentially hostile Black targets on decisions to shoot.

Most phenotypic stereotypicality research has focused on untimed explicit and deliberate judgements (e.g., Eberhardt et al., 2004, 2006). In contrast, the shooter task involves spontaneous split-second decisions that are very difficult to consciously override. Evidence suggests that the shooter task, like other race-based weapon-identification tasks (e.g., Payne, 2001), activates racial stereotypes and reflects implicit stereotyping (e.g., Judd, Blair, & Chapleau, 2004; Payne, 2006; Wittenbrink, Judd, & Park, 2001; see also Glaser & Knowles, 2008; Mendoza, Gollwitzer, & Amodio, 2010). The limited work that has been done on phenotypic stereotypicality’s influence on implicit attitudes has relied exclusively on implicit association test (IAT) categorization or priming tasks (e.g., Livingston & Brewer, 2002; Uhlmann, Dasgupta, Elgueta, Greenwald, & Swanson, 2002). The shooter task provides an alternative way to measure implicit stereotyping,
involving more realistic situations with potentially more consequential implications.

**Study 1**

In Study 1, we assess whether perceived phenotypic racial stereotypicality increases implicit racial stereotyping and bias among outgroup members: that is, whether non-Black participants display biased decision-making when evaluating Black targets. Specifically, we hypothesize that targets’ phenotypic stereotypicality will lead to within-group implicit stereotyping differences in the shooter task. Because shooter bias is based on the knowledge of cultural stereotypes linking Blacks with danger, it is hypothesized that high stereotypical (HS) Black targets will be subjected to greater levels of shooter bias than low stereotypical (LS) Black targets or White targets. Specifically, the stronger race–danger association for HS Black targets should lead participants to adopt a lower shooting criterion, or level at which an individual decides to shoot, for HS Black targets compared to LS targets or White targets. This lower decision threshold is expected to increase the frequency of false alarms (shooting an unarmed target) and decrease the frequency of misses (choosing not to shoot an armed target) directed at HS Black targets, culminating in increased levels of implicit stereotyping and overall patterns of shooter bias.

**Design**

A 2 (object type: gun vs. neutral object) × 3 (Black stereotypicality: high vs. low vs. White) within-subjects design was used for the experiment.

**Method**

**Participants**

Forty-three undergraduate students (13 males) at a large university participated for partial course credit. Twenty-five identified as Asian or Asian American, nine as White, four as Latino, four as other (non-Black), and one as Indian. Four participants (three Asian, one White) were excluded due to recognizing a target, having non-normal vision, or guessing the stereotypicality hypothesis.

**Materials**

**Videogame** A “shoot/don’t” shoot videogame (similar to the videogame used by Correll et al., 2002) using DirectRT software was created in which target stereotypicality (HS Black, LS Black, White) and object types (gun, neutral) were manipulated. The videogame began with nine practice trials with an Asian target followed by 144 experimental trials. The 144 experimental trials broke down to the following: 72 Black target trials (36 HS, 36 LS) and 72 White trials. There were six Black (three HS, three LS) and six White targets. Therefore, as in the original shooter bias game by Correll et al. (2002), there was an equal amount of each target race in the game, as participants saw half of the trials with Black targets and half with White targets. Within each group of Black and White target trials, there were 18 gun trials (two types of guns) and 18 neutral object trials (two types of neutral objects: nine wallet and nine cell phone). Targets struck three different poses with each object (object to the side, object by the waist, and object pointed straight ahead). Each trial consisted of a blank background that appeared on the screen for a randomly determined amount of 1–3 seconds, followed by a target photograph that was presented for a maximum of 630ms. The 630ms response window was established by Correll et al. (2002) to be limited enough to observe shooter bias in error rates. The photograph was always presented in the center of the blank screen. However, because of the various positions of the objects held by the targets, the object appeared in different places each time, meaning that participants could not focus only on one point of the screen. Further, it was chosen to display the target photographs on blank screens instead of against various backgrounds. In doing so, we isolated the role of racial phenotype apart from any effect that background setting might have on implicit attitudes and shooter bias (see Wittenbrink et al., 2001).

During the 630ms response window, the participant decided to shoot or not to shoot the presented target by pressing one of two labeled keys.
on the computer keyboard. If participants did not respond in the time allowed, a screen appeared saying, “Too Slow! Please respond faster.” Participants did not receive any other feedback on whether their decisions were correct or incorrect. Because of the fast-paced nature of the game and trials, participants were not biased or distracted by their feedback and remained focused on the task throughout the entirety of the game.

**Targets** To manipulate target stereotypicality, photographs were taken of Black and White male targets from the waist up. Targets had neutral facial expressions and wore grey sweatshirts. Using Photoshop, HS and LS Black targets were created from photos of Black individuals of average stereotypicality. The HS versions received darker skin tone, a broader nose, and thicker lips than the original photograph, while the LS versions received lighter skin tone, a narrower nose, and thinner lips than the original photograph. Because they originated from the same photos, subtle cues between the HS and LS targets (e.g., facial expression, body posture) were identical (see Figure 1 for example targets employed in the “shoot/don’t shoot” videogame).

**Target pretesting** Twenty-three non-Black pretesting participants used seven-point Likert scales to rate the targets on perceived phenotypic racial stereotypicality. HS Black targets were viewed as more stereotypically Black ($M = 5.95$) than the LS Black targets ($M = 4.17$, $t(22) = 5.27, p < .001$), and the LS Black targets were viewed as more stereotypically Black than the White targets ($M = 1.0, t(22) = 13.19, p < .001$). Moreover, White targets were rated as significantly more stereotypically White ($M = 6.08$) than LS Black targets ($M = 2.26, t(22) = 13.73, p < .001$), and LS Black targets were perceived as more stereotypically White than the HS Black targets ($M = 1.0, t(22) = 5.52, p < .001$). When asked to classify each target into a racial group (Black, White, Asian, Latino), 100 percent of participants categorized White targets as White, 91 percent categorized LS Black targets as Black (none categorized them as White), and 100 percent categorized the HS Black targets as Black. There were no significant differences in attractiveness ratings between the HS Black, LS Black, and White targets (all $t$s ns). Finally, participants believed the HS Black and LS Black targets (derived from the same photographs) to be different people when playing the “shoot/don’t shoot” videogame.

**Procedure**

Participants were seated in front of a personal computer (PC) by a White research assistant. Each participant was given instructions and played the videogame, lasting 15 minutes. Lastly, participants completed a questionnaire that included demographics and a probe for suspicion.

**Results**

Following the guidelines outlined by Correll and colleagues (2002), error rates served as the
measurement of shooter bias. Errors were defined as incorrectly deciding to shoot an unarmed suspect or not shoot an armed suspect. Error rate scores were defined as the number of errors divided by the number of valid trials. Timeouts (i.e., when the participant did not respond in the 630ms window) were considered invalid trials. Error rate patterns across stereotype consistent trials (Black/gun, White/neutral object conditions), versus stereotype inconsistent (Black/neutral object, White/gun) were compared. As in Correll et al.’s (2002) original studies of shooter bias, this discrepancy in error rates between Black and White targets, in line with racial stereotypes regarding threat and danger, represents the measurement of shooter bias.

Error rates were analyzed using a within-subject Analysis of Variance (ANOVA), revealing an object × stereotypicality interaction ($F(2, 76) = 8.28, p < .001, \eta^2 = .18$) (see Figure 2 which graphs the means as error rate percentages).

Replicating the original shooter bias effect and aligned with racial stereotypes, simple effects tests indicated that HS Blacks were more likely to be mistakenly shot ($M = .113, SD = .13$) when holding a non-threatening object than Whites ($M = .076, SD = .12, F(1, 76) = 5.13, p < .05$), whereas Whites were more likely to be mistakenly not shot ($M = .133, SD = .14$) when carrying a dangerous weapon than HS Blacks ($M = .081, SD = .11, F(1, 76) = 10.60, p < .01$). That is, HS Blacks were more likely to erroneously receive a response in accordance with threatening stereotypes: being shot more often when unarmed, and being not shot less often when compared to White targets.

While these error rate differences between HS Blacks and Whites replicate the original shooter bias findings, the main hypothesis for the current study predicts that HS Blacks and LS Blacks will experience differential levels of implicit stereotyping, such that HS Blacks should induce more errors in the no-gun condition and fewer errors in the gun condition. As hypothesized regarding these within-group differences in implicit stereotyping, HS Black targets elicited more shooter bias than LS Black targets by prompting these differential error responses. In the neutral object condition, HS Black targets were mistakenly shot more often than LS Black targets ($M = .079, SD = .11, F(1, 76) = 4.60, p < .05$), indicating a biased response toward danger and threat compared to LS Black targets. In the gun condition, LS Black targets were significantly more likely than HS Blacks to prompt an incorrect “don’t shoot” response ($M = .112, SD = .13, F(1, 76) = 4.11, p < .05$), signifying that LS Blacks were perceived to be less threatening than HS Blacks. Continuing on, responses toward armed LS Black targets compared to White armed targets trended toward significance ($F(1, 76) = 1.75, p < .2$), indicating they were somewhat less likely to be incorrectly not shot compared to White targets. Differences between LS Black and White targets in the neutral object condition were not significant ($F(1, 76) < 1, ns$).

Figure 2. Study 1 error rates by target race and object type.

Note: Error rates are graphed as overall percentages of trials that an incorrect response was made. In the gun condition, error rates represent incorrectly deciding to ‘not shoot’ an armed target. In the neutral object condition, error rates represent incorrectly deciding to ‘shoot’ an unarmed target.
Signal detection analyses

Replicating past shooter bias work (see Correll et al., 2002), signal detection analyses\(^2\) (Green & Swets, 1966; MacMillan & Creelman, 1991) were employed to analyze the cause of the biased response patterns. By categorizing errors into false alarms (shooting an unarmed target) or misses (not shooting an armed target), signal detection compares the sensitivity to object type \(d'\), i.e., participants ability to distinguish between guns and neutral objects for each target) and the threshold at which shooting decisions occur \(\theta\), i.e., the point at which decisions to shoot are made. Mimicking past shooter bias findings (e.g., Correll et al., 2002), no differences were found in sensitivity to object \(d'\) as a function of target race (HS Black: \(M = 2.89, SD = .92\); LS Black: \(M = 2.91, SD = .98\); White: \(M = 2.83, SD = .88\); \(F(2, 76) < 1, \text{ all simple effects } F_{s} < 1, \text{ no differences}\)), indicating that participants’ ability to distinguish guns from non-guns is not compromised by the target race. That is, participants’ accuracy at differentiating guns from neutral objects is the same for both White and Black targets, and did not cause the biased error rate responses.

We next tested the threshold or decision criterion \(\theta\) at which decisions to shoot are made. The decision criterion \(\theta\) represents the threshold in a distribution at which an individual decides to shoot a threatening target. Again mimicking the original Correll et al. findings, these analyses revealed that the threshold \(\theta\), or decision criterion, at which people decide to shoot a target varied by target race \(F(2, 76) = 8.08, p < .001, \text{ partial } \eta^2 = .17\). Simple effects tests indicate that participants set a lower threshold for deciding to shoot HS Black targets \((M = .08, SD = .29)\) compared to both LS Black \((M = .10, SD = .22)\), \(F(1, 76) = 8.32, p < .001\), and White \((M = .16, SD = .33)\), \(F(1, 76) = 14.79, p < .001\) targets. Essentially, HS Black targets needed to be less threatening to be shot compared to LS Black targets or White targets. This lower threshold and disposition to shoot HS Black targets leads to more errors in the neutral object condition (i.e., “false alarms”), and less errors in the gun condition (i.e., “misses”), producing the shooter bias error patterns.

Discussion

The results of Study 1 indicate that perceived phenotypic racial stereotypicality impacts implicit stereotyping among outgroup members. That is, perceived phenotypic stereotypicality affected the amount of shooter bias racial outgroup members directed at high stereotypical Black targets. Due to their greater association with stereotypes linking Blacks with danger, HS Black targets were mistakenly shot more often than LS Black targets or White targets, and were mistakenly not shot less often than LS Black or White targets. Further, participants adopted a lower decision criterion for HS Black targets, signifying that there was a greater willingness to pull the trigger and shoot HS Black targets. This stereotypically-biased response pattern indicates that phenotypic racial stereotypicality for Blacks can produce within-group stereotyping on implicit and less controllable tasks.

Study 2

Within the stereotypicality and skin tone bias literature, the majority of research has focused on Whites’ or other outgroup members’ perceptions of HS versus LS Blacks. Significantly less experimental research has focused on stereotypical biases among one’s own ingroup. That is, would Blacks make stereotypicality-biased responses against other Blacks?

Prior research on perceived stereotypicality within the Black community has employed solely explicit and untimed evaluations such as memory tasks and picture matching (e.g., Averhart & Bigler, 1997; Maddox & Gray, 2002). It suggests that a similar stereotypicality bias exists within their own racial group, such that HS Blacks are stereotyped to a greater degree than LS Blacks. Similar to Whites, Blacks cognitively encode skin tone differences and are aware of the different skin tone-based Black stereotypes (Maddox & Gray, 2002). In addition to this awareness of stereotypes based on skin tone, Blacks describe darker-skinned Blacks in more stereotypic terms than lighter-skinned Blacks, including perceptions of criminality and aggression (Maddox & Gray, 2002; see also Maddox & Chase, 2004). Further, evidence from
the developmental literature suggests that Black children have a better memory for stereotypic-consistent information regarding Blacks’ skin tone (Averhart & Bigler, 1997).

While limited experimental research suggests that Blacks display within-group stereotyping based on perceived phenotypic stereotypicality, research has not assessed whether such biases extend to implicit measures of stereotyping. Study 2 tests whether phenotypic stereotypicality will affect implicit stereotyping against members of one’s own ingroup – that is, among Black participants. Using Black participants, we will investigate whether Blacks display stereotypicality biases against Black targets in the shooter paradigm, which represents a fast-paced, less controllable and more implicit measure of unintended stereotyping and discrimination (e.g., Glaser & Knowles, 2008; Judd et al., 2004; Mendoza et al., 2010; Payne, 2006; Wittenbrink et al., 2001). Because shooter bias is based on the knowledge of cultural stereotypes, Black participants have been shown to display similar levels of between-group shooter bias against Black targets as White participants (Correll et al., 2002). Due to their awareness of cultural stereotypes based on skin tone (Maddox & Gray, 2002), we predict that perceived stereotypicality will influence shooter bias also for Black participants. That is, among Black participants, we expect that racial stereotypes linking Blacks with danger will be more strongly associated with, and applied to, HS compared to LS Blacks, and thus Black participants will exhibit more shooter bias against HS Black targets. We further predict that, as in Study 1, a lower threshold will be adopted for HS Black targets, indicating a greater willingness to shoot these targets, resulting in the biased response patterns.

Method
Participants
Forty-five Black undergraduate students (14 males) at a large university participated for partial course credit. Three participants were excluded for recognizing a target or having non-normal vision.

Design
As in Study 1, a 2 (object type: gun vs. neutral object) × 3 (Black stereotypicality: high vs. low vs. White) within-subjects design was employed.

Materials
Videogame The shooter bias game was identical to Study 1. After nine practice trials with Asian targets, each of the 144 experimental trials began with a blank background that appeared on the screen for anywhere between 1 and 3 seconds, after which a target photograph was displayed. Displayed targets held either a neutral object or a gun. Participants had a maximum of 630ms to shoot or not shoot the presented target by pressing the designated keys. Participants that took longer than the 630ms response window received a message indicating that the response was too slow. Participants received no other feedback on their responses.

Procedure
The procedure was identical to the Study 1 protocol. Participants were given instructions by a White research assistant and played the videogame on a PC. Upon completion, participants completed a questionnaire that included demographics and a probe for suspicion.

Results
Replicating the results of Study 1, a within-subject Analysis of Variance (ANOVA) on error rates revealed a significant object type × target stereotypicality interaction \( F(2, 82) = 4.86, p < .01, \) partial \( \eta^2 = .11 \) (see Figure 3).

Simple effects tests were used to break down the interaction. First we replicated the basic shooter bias effect between HS Black and White targets. Fewer errors were made with armed HS Blacks \( (M=1.01, SD=.11) \) than armed Whites \( (M = .147, SD = .13) \), \( F(1, 82) = 7.50, p < .01 \) and, although non-significant, HS Blacks were trending in the direction of being mistakenly shot more
often when holding a neutral object ($M = .115, SD = .13$), than unarmed Whites ($M = .094, SD = .09, F(1, 82) = 1.7, p < .2$). These results are consistent with the basic shooter bias effect, such that Black targets were seen as more dangerous than White targets, leading to less errors in the armed condition and more errors in the unarmed condition.

Next we tested the main experimental hypothesis, that perceived phenotypic racial stereotypicality would impact shooting decisions for Black targets such that a greater amount of shooter bias would be directed at HS compared to LS Black targets. Confirming our hypotheses, simple effects tests demonstrated that in the neutral object condition, HS Blacks were mistakenly shot more often than LS Blacks ($M = .082, SD = .10, F(1, 82) = 3.91, p < .05$). Similarly, in the gun condition, LS Blacks were mistakenly not shot ($M = .129, SD = .11$) more often than HS Blacks ($F(1, 82) = 4.1, p < .05$). These results indicate that HS Blacks were seen as more dangerous than LS Blacks, receiving more implicit stereotyping that biased responses in stereotype-consistent ways (i.e., fewer errors in the gun condition, and more errors in the neutral object condition). No differences were seen between LS Black and White targets ($F(1, 82) < 1, ns$).

**Signal detection analyses**

Signal detection analyses also mirrored Study 1. We calculated the sensitivity to object type ($d'$) and the threshold at which shooting decisions occur ($\theta$) in order to determine the source of the error rates. That is, were the errors caused by differences in the ability to detect the type of object for Black and White targets ($d'$), or due to differences in willingness to shoot Black and White targets ($\theta$)? As in Study 1, no differences emerged in object accuracy by race, or $d'$ ($F(2, 82) < 1, ns$, all simple effects test $F$s $< 1$, $ns$). This statistic indicates that participants were equally accurate in differentiating threatening versus non-threatening objects for HS Black, LS Black, and White targets. Conversely, significant differences were found regarding the threshold ($\theta$), or decision criterion, at which people decide to shoot a target. The threshold varied depending on target race ($F(2, 82) = 4.19, p < .01$). Specifically, a lower threshold for shooting was adopted for HS Black targets ($M = -.02, SD = .25$) compared to both LS Black ($M = .12, SD = .26, F(1, 82) = 7.08, p < .001$), and White ($M = .11, SD = .29, F(1, 82) = 5.45, p < .01$) targets. No differences emerged between LS Black and White targets ($F < 1, ns$). As in Study 1, these results indicate that participants set a lower threshold to shoot HS Black targets compared to LS Black or White targets, which produced more errors in the neutral object condition (“false alarms”) compared to the gun condition (“misses”).

**Discussion**

Black participants displayed stereotypicality-based implicit biases against members of their racial
ingroup. Making split-second decisions on whether to shoot a target, Black participants exhibited greater shooter bias against HS Blacks than LS Blacks or Whites. That is, they were more likely to mistakenly shoot unarmed HS Blacks compared to unarmed LS Blacks, and mistakenly not shoot armed LS Blacks more often than armed HS Blacks. Further, as in Study 1, signal detection analyses indicated that a lower decision criterion was adopted for HS Black targets, which produced increased shooter bias against these targets. Because HS Blacks were implicitly stereotyped as dangerous to a greater extent than LS Blacks, participants biased their responses toward shooting HS Blacks. The results of the current study provide the first evidence that perceived stereotypicality biases among Blacks may operate against their own group members at less controllable, unintended and implicit, as well as explicit, levels.

Conclusion

Perceived phenotypic racial stereotypicality biases individuals’ implicit judgments in stereotype-consistent ways. Among both outgroup (Study 1) and ingroup (Study 2) members, high levels of perceived phenotypic racial stereotypicality lead to increased implicit stereotyping of Black targets. While most phenotypic racial stereotypicality research has focused on explicit perceptions and untimed evaluations (e.g., Eberhardt et al., 2004, 2006), our studies provide evidence that phenotypic Black stereotypicality can bias even quick decisions. The short response window in the shooter task lends further evidence that these stereotypicality biases are efficient and can operate without extensive cognitive resources (Blair, 2006; Blair et al., 2004b). Despite the response window of approximately half a second, participants were sensitive to, and used, these within-race physical variation cues to influence their decision criterions and ultimate decisions.

The current studies demonstrate that more prototypical members of the category are more likely to be the target of implicit stereotyping and elicit shooter bias. While HS Blacks received the most implicit stereotyping in the shooter game, LS Black targets received weak or little bias, often showing no significant differences when compared to White targets. This pattern in the current data suggests that shooter bias might be limited to high stereotypical Black targets, a more defined group than the initial findings suggested. However, we are cautious in this interpretation. With increased power, some of the differences between LS Black and White targets may be significant, as many trended in the predicted directions. Further, stereotypicality research consistently shows that low stereotypical Blacks are still the targets of stereotyping, prejudice and bias (e.g., Maddox, 2004). Therefore, to suggest that low stereotypical group members are immune to shooter bias seems premature. Nonetheless, it appears that highly stereotypical group members are at greater risk for shooter bias and implicit stereotyping in general.

The results of both studies also highlight how different racial groups exhibit phenotypic stereotypicality biases, as both Black and non-Black participants displayed similar patterns of increased bias against highly stereotypical targets across studies. In Study 1, a diverse group of racial outgroup members, including a large number of Asian and Asian American participants, showed the broad impact of both within-group stereotyping based on phenotypicality and the shooter bias effect. In fact, almost the entirety of shooter bias work has been based on Black and White participants, and the current study extends this effect to include Asians. Further, because Blacks are aware of the cultural stereotypes regarding their racial group and danger, it follows that they differentially associate it among members of their own racial group. However, until the current study, the only evidence for this bias among Black evaluators against their ingroup has involved explicit evaluations. That it is also reflected in implicit evaluations enhances our understanding of the depth of these within group biases.

While consistent in pattern, the influence of perceived phenotypic stereotypicality may be a bit weaker for ingroup members. Comparing the magnitude of shooter bias across studies, in Study 1 with racial outgroup members, the overall partial eta square was .18, while it was reduced to .11 in
Study 2. Further, the differences between high and low stereotypical Blacks were also somewhat weaker in Study 2 (neutral object partial $\eta^2 = .10$; gun: partial $\eta^2 = .09$) compared to Study 1 (neutral object partial $\eta^2 = .13$; gun: partial $\eta^2 = .10$). This pattern is consistent with research demonstrating that the Black–weapon stereotype is weaker, but still present, among Blacks than members of other racial groups (Nosek et al., 2007). It also suggests that there might be group-specific moderators of the effect for Black participants, such as individuals’ level of phenotypic stereotypicality or ethnic identification.

Racial stereotypes linking Blacks with danger play a central role in the biased response patterns related to shooter bias. However, the specific level or way in which stereotypes have their effects still needs to be determined. Specifically, our results could have arisen due to differences in levels of stereotype activation or stereotype application. In line with most phenotypicality research, we suggest that racial stereotypes were differentially applied to HS and LS Blacks. That is, both HS and LS Blacks activated racial stereotypes, but they were more strongly associated with HS, compared to LS, Blacks. However, it is also possible that LS Blacks were perceived to be far enough away from the central racial category that they did not activate racial stereotypes at all or activated them to a lesser extent. Dixon and Maddox (2005) suggest that dark-skinned Blacks may reach a threshold in which racial stereotypes are activated and applied, while light-skinned Blacks may fall short of such levels. Although consistently viewed as Black by participants in the current studies, LS Black targets may not make the Black stereotype salient enough to impact shooting behavior and implicit levels. Future research could disentangle more carefully the specific ways in which racial stereotypes lead to the biased response patterns.

Research on shooter bias and race-based weapon misidentification effects is still in its early stages, and more work addressing moderating conditions and mediational mechanisms is required. Other operationalizations of stereotypicality, beyond phenotypicality, may affect shooter bias and implicit stereotyping. In the current studies, target stereotypicality involved still photographs of Black targets high and low in Black stereotypicality, with differences centered on skin tone and facial features. In a video simulation with live-action targets, stereotypicality effects may extend into areas such as motion or speech patterns (see Ko, Judd, & Blair, 2006), such that targets with more stereotypically “Black” voices or walking gaits may elicit stronger bias. These live-action factors would likely interact with the stereotypicality features examined in the present research. These phenotypicality effects should be examined for other racial groups as well. Similar stereotypicality biases may also play a role for Latinos or other racial groups, and the impact of Black phenotypicality may even extend beyond the Black racial group. Although the current study limited the examination to phenotypic stereotypicality among Black targets, some evidence suggests that Whites with Afrocentric, or stereotypically Black, facial features are also susceptible to negative stereotyping (e.g., Blair et al., 2002, 2004b), and therefore may be more likely to receive shooter bias. Further, another critical factor that needs to be examined is the environmental context in which the shooting decisions occur, as currently the environmental contexts employed in most “shoot/don’t shoot” games are neutral or non-existent. Stereotypically “Black” (e.g., a church) or “threatening” (e.g., a ghetto) environmental contexts have been shown to influence implicit stereotyping (e.g., Wittenbrink et al., 2001). Thus, similar bias reductions and amplifications may be found in the shooter paradigm with environmental contexts that prime race or impart threatening cues.

The implications of the current studies for policing and society are significant. As so eloquently described by the opening quote, perhaps nothing incites racial tension and inspires distrust as much as police shootings of innocent and unarmed minorities. Suspect stereotypicality, in addition to racial category, is a critical dimension to consider when investigating these shooting decisions. Research with police officers as participants has found shooter bias in error rates (Plant...
As described, our study suggests that highly stereotypical Blacks may drive the shooter bias phenomenon. Consequently, intervention work with the police may be well served by focusing on HS Black targets as a means of reducing the effects of racial bias. Through continued research, we can understand better the shooter bias effect and, more importantly, learn the most productive strategies to counteract it.

Notes
1. Because of the time pressure induced by the short 630ms response window, no significant effects were hypothesized nor found for reaction times. As Correll et al. (2002, 2007) noted, the 630ms response window pushes the respondents into errors, leaving little variance in response times.
2. An alternative analysis strategy that also would be appropriate is the process dissociation approach (Payne, 2008). This approach distinguishes between automatic and intentional uses in memory. We chose to use signal detection analyses for the current data because it replicates the original shooter bias work by Correll et al., and therefore allows for comparisons with the original findings.

References


Biographical notes

KIMBERLY BARSAMIAN KAHN is a PhD candidate in Social Psychology at the University of California, Los Angeles. Her research interests examine how stereotypes impact behaviors and judgments from both the targets’ and perceivers’ perspectives. Specifically, she investigates the phenomena of shooter bias, phenotypic stereotypicality biases, and stereotype threat.

PAUL G. DAVIES is a Professor at the University of British Columbia, Canada, which he joined in 2007. After completing his PhD in Psychology at the University of Waterloo, he accepted a post-doctoral fellowship at Stanford University. In 2003, he became an Assistant Professor at University of California, Los Angeles. He has more than 20 publications in the area of stereotypes, prejudice, and discrimination.