The Generalization of Implicit Racial Bias to Young Black Boys: Automatic Stereotyping or Automatic Prejudice?

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Abstract

Although children typically elicit benevolence and care from adults, these protections are not afforded equally to children of all races: Implicit racial biases commonly directed toward Black adults appear to generalize to young Black children. In two experiments, we tested whether such effects reflect biases in semantic associations (i.e., automatic stereotyping), evaluative associations (i.e., automatic prejudice), or both. White participants categorized objects and words that varied in racial stereotypicality and valence after brief presentations of male faces that varied in race (Black, White) and age (adults, children). Results revealed consistent support for a *general-stereotyping* account: Seeing Black male faces, regardless of age, facilitated the identification of both negative and positive stereotypic stimuli. We also found some support for a *prejudice* account, as these same faces facilitated the identification of negative stimuli more generally. Process-dissociation-procedure analyses further revealed that these effects were driven primarily by automatic (i.e., unintentional) racial bias.

Keywords: implicit bias; intersectionality; prejudice; process dissociation; stereotyping

The Generalization of Implicit Racial Bias to Young Black Boys: Automatic Stereotyping or Automatic Prejudice?

A hallmark of youth is the notion of childlike innocence. Children tend to be viewed as kind and harmless, typically eliciting benevolence and care from adults (McDougall, 1908). These positive affordances of youth are so strong that they are sometimes granted to baby-faced adults (Montepare & Zebrowitz, 1998). But are such protections extended equally to children of all races, including children from racial groups that are associated with characteristics that contradict notions of harmlessness? Accumulating evidence suggests they are not: Racial biases commonly directed toward Black adults are also directed toward young Black children. Our aim here was to gain a better understanding of the nature of these racial biases.

Pervasive cultural stereotypes link Black Americans with violence and criminality (Devine, 1989), and recent findings suggest that Black youth may be viewed through the lens of these threat-related associations. For example, negative racial stereotypes are more likely to be applied to Black than White adolescents and children (Small et al., 2012). Black adolescents are also judged as more culpable and receive harsher punishments than same-age White adolescents for identical criminal offenses (Goff et al., 2014). Moving beyond explicit judgments, Todd et al. (2016) found that 5-year-old Black boys are more likely than same-age White boys to be *implicitly* associated with threat: White participants identified guns more easily after seeing Black than White faces, and this racial bias was comparable after adult and child faces. These and other findings (e.g., Okonofua & Eberhardt, 2105; Rattan et al., 2012) suggest that reactions to Black youth seem to align with negative threat-based associations, much like reactions to Black adults often do. But because this prior work has focused almost exclusively on *negative* characteristics associated with Black Americans, it is unclear whether racial biases toward children reflect biases in semantic associations (i.e., stereotyping), evaluative associations (i.e., prejudice), or both. We addressed this question as it pertains to *implicit* bias toward young Black boys relative to young White boys.

The conceptual distinction between stereotyping and prejudice provides a useful framework for understanding the operation of implicit racial bias. Stereotypes, which refer to semantic knowledge (e.g., traits) associated with a group, reflect the cognitive component of intergroup bias. Prejudice, in contrast, refers to evaluations and emotional responses toward a group; it reflects the affective component of intergroup bias (Fiske, 1998). Both sources of bias may arise automatically, and they typically operate in concert to influence intergroup judgment and behavior. Importantly, however, implicit stereotypes (semantic associations) and implicit prejudice (evaluative associations) have distinct (but interacting) neural underpinnings and, at times, have independent effects on judgment and behavior (Amodio, 2008). For example, Amodio and Devine (2006) found that implicit stereotyping uniquely predicted *instrumental* outcomes (e.g., performance expectations), whereas implicit prejudice uniquely predicted *consummatory* outcomes (e.g., interpersonal distance) during interracial interactions.

Because these different sources of bias predict different types of discriminatory behavior, it is important to understand whether racial bias toward young boys is more aptly characterized as stereotyping, prejudice, or some combination of the two. Pinpointing the source of such biases may also provide insight into how best to combat them. For example, implicit biases stemming from stereotypes may best be managed by interventions targeting semantic associations (e.g., Blair et al., 2001), whereas biases borne out of prejudice may best be managed by interventions targeting evaluative associations (e.g., Kawakami et al., 2007).

We considered three potential hypotheses, each of which has received some support in prior work on implicit racial bias toward adults. The *general-stereotyping* hypothesis predicts that encountering Black boys, relative to encountering White boys, activates all semantic content (negative and positive) associated with Black Americans (Kawakami et al., 1998). Alternatively, the *negative-stereotyping* hypothesis predicts that exposure to Black boys, relative to exposure to White boys, activates negative, but not positive, semantic content associated with Black Americans (Wittenbrink et al., 1997). Finally, the *prejudice* hypothesis predicts that seeing Black boys, relative to seeing White boys, activates globally negative associations, regardless of stereotypicality (Fazio et al., 1995). We tested these hypotheses in two experiments. Below, we report how we determined our sample sizes, all data exclusions, manipulations, and measures.

Experiment 1

Experiment 1 used a sequential-priming task wherein participants categorized negative and positive objects that were consistent with (guns, sports equipment) or irrelevant to (insects, flowers) stereotypes of Black Americans after briefly-presented faces of Black and White men and boys (cf. Judd et al., 2004). Our outcomes of interest were response times (RTs) and error rates, which are commonly used as indicators of automatic processing on sequential-priming tasks (Wentura & Degner, 2010). Because neither metric provides a process-pure index of automatic processing, however, we also used Jacoby's (1991) process-dissociation-procedure (PDP), which assumes that both automatic and controlled responses contribute to task performance. Prior research has successfully used PDP analyses to disentangle the unique contributions of automatic and controlled processes on similar sequential-priming tasks (e.g., Amodio et al., 2004; Payne, 2001; Todd et al., 2016).

Based on prior work (Todd et al., 2016), we predicted that any observed racial bias would be comparable across prime age. The general-stereotyping hypothesis further predicts race-biased identification of Black-stereotypic objects, regardless of valence, whereas the negative-stereotyping hypothesis predicts race-biased identification of negative, but not positive, Black-stereotypic objects. Finally, the prejudice hypothesis predicts race-biased identification of negative objects, regardless of stereotypicality.

Method

We based our target sample size on prior research (Todd et al., 2016). Although this prior work used samples of roughly 60 participants, we set a target sample of about 120 participants. Data were collected until this target number was surpassed. White undergraduates (N=146) participated for course credit. We excluded data from 1 participant who pressed the same key on every trial. We also excluded data from 3 participants with below-chance task performance; retaining their data produced nearly identical results. These exclusions left a final sample of 143 (85 women, 50 men, 9 unreported).

Participants completed a sequential-priming task wherein two images flashed in quick succession (Payne, 2001). They were told to ignore the first (prime) image and to quickly categorize the second (target) image by pressing one of two response keys (key assignments were counter-balanced across participants). The primes were 12 photos of young boys (6 Black, 6 White) from LoBue and Thrasher (2015) and 12 photos of men (6 Black, 6 White) from Ma et al. (2015). We selected these photos using the following criteria: The faces had to be easily categorized by age and race, have a neutral expression, and have no idiosyncrasies (e.g., scars).[1]

[1] Pilot testing revealed that adult faces were rated as more threatening and less trustworthy than child faces; however, there were no significant differences involving race. White faces were also rated as marginally more attractive than Black faces, but there were no significant differences involving age (for more information, see the Supplemental Materials).

The task comprised two blocks of trials (block order was counter-balanced across participants[2]). In the *negative* block, participants categorized negative targets—6 gun images (Black-stereotypic) from Payne (2001) and 6 insect images (non-stereotypic) from online sources—as guns or insects. In the *positive* block, participants categorized positive targets—6 sports equipment (e.g., basketball, football) images (Black-stereotypic) and 6 flower images (non-stereotypic) from online sources—as sports equipment or flowers.

Each trial began with a fixation cross (500 ms), then a face prime (200 ms), a target object (200 ms), and finally a pattern mask (on screen until participants responded). If participants did not respond within 500 ms, a message ("Please respond faster!") appeared for 1 s. Eight practice trials preceded each block of 288 randomly-ordered experimental trials.

Results

We report the results most pertinent to our hypotheses (for additional results, see the Supplemental Materials). Table 1 displays descriptive statistics for all prime-target combinations.

RTs. Following Payne (2001), we excluded trials with errors (14.1%) and RTs<100 ms (3.5%). We also excluded trials with RTs>2.5 *SD* from the grand mean in each trial block (<1%) and log-transformed the remaining RTs; however, we report raw RTs for interpretive ease.

Supporting the general-stereotyping hypothesis, a 2 (Prime Age) × 2 (Prime Race) × 2 (Target Valence) × 2 (Target Stereotypicality) ANOVA revealed a Prime Race × Target Stereotypicality interaction, $F(1, 142)=34.84$, $p<.001$, $\eta_p^2=.20$. Participants identified stereotypic stimuli more quickly, $t(142)=3.62$, $p<.001$, $g_{av}=0.14$, and non-stereotypic stimuli marginally more slowly, $t(142)=1.80$, $p=.074$, $g_{av}=0.10$, after Black than White primes. The Prime Age ×

[2] Preliminary analyses revealed several moderating effects of block order in both experiments (see the Supplemental Materials); however, they did not meaningfully alter the general conclusions in either experiment.

Prime Race × Target Stereotypicality interaction was not significant (*F*=1.38, *p*=.24, η_p^2=.01), indicating comparable racial stereotyping across prime age.

Contrary to the prejudice hypothesis, the Prime Race × Target Valence interaction was not significant (*F*<1, *p*=.99, η_p^2<.01). Contrary also to the negative-stereotyping hypothesis, the Prime Race × Target Valence × Target Stereotypicality interaction was not significant (*F*<1, *p*=.67, η_p^2<.01). The 4-way interaction also failed to reach significance (*F*<1, *p*=.99, η_p^2<.01), indicating comparable negative and positive racial stereotyping across prime age.

Finally, in a more focused test of the negative-stereotyping hypothesis that included gun and sports-equipment trials only, a 2 (Prime Race) × 2 (Target Valence) ANOVA yielded a Prime Race main effect, *F*(1, 142)=35.92, *p*<.001, η_p^2=.20, but no moderation by Target Valence (*F*<1, *p*=.85, η_p^2<.01). These results provide no support for the negative-stereotyping hypothesis.

Error rates. For the error-rate analyses, we excluded trials with RTs<100 ms and RTs exceeding the response deadline. Supporting the general-stereotyping hypothesis, there was a Prime Race × Target Stereotypicality interaction, *F*(1, 142)=58.64, *p*<.001, η_p^2=.29. Participants misidentified non-stereotypic stimuli more often, *t*(142)=5.10, *p*<.001, g_{av}=0.17, and stereotypic stimuli less often, *t*(142)=3.56, *p*<.001, g_{av}=0.14, after Black than White primes. The Prime Age × Prime Race × Target Stereotypicality interaction was not significant (*F*<1, *p*=.43, η_p^2<.01), indicating comparable racial stereotyping across prime age.

Contrary to both the prejudice hypothesis and the negative-stereotyping hypothesis, neither the Prime Race × Target Valence interaction nor the Prime Race × Target Valence × Target Stereotypicality interaction was significant (*F*s<1, *p*s>.56, η_p^2s<.01). The 4-way interaction also failed to reach significance, *F*(1, 142)=2.36, *p*=.127, η_p^2=.02, indicating comparable negative and positive racial stereotyping across prime age.

Finally, a more focused test of the negative-stereotyping hypothesis that was analogous to the one on RTs revealed a Prime Race main effect, $F(1, 148)=33.46$, $p<.001$, $\eta_p^2=.19$, but no moderation by Target Valence ($F<1$, $p=.61$, $\eta_p^2<.01$). These results again provide no support for the negative-stereotyping hypothesis.

PDP estimates. We next conducted PDP analyses to estimate the unique contributions of automatic and controlled processing on task performance. The PDP approach assumes that the respective contributions of automatic and controlled processes can be dissociated by using tasks that place these processes both in concert and in opposition (Jacoby, 1991). For example, when a gun appears after a Black face, both automatic racial bias and accurately identifying the object lead to the same “gun” response (i.e., congruent trials). In contrast, when an insect appears after a Black face, automatic bias favors a “gun” response but accurately identifying the object favors an “insect” response (i.e., incongruent trials). The critical equations for calculating estimates of controlled (*C*) and automatic (*A*) processing are as follows (for the full set of equations, see Payne, 2005):

$$C=P(\text{correct}|\text{congruent trials})–P(\text{incorrect}|\text{incongruent trials})$$

$$A=P(\text{incorrect}|\text{incongruent trials})/(1–C)$$

Thus, *C* reflects the ability to accurately distinguish the target objects, independent of response biases, whereas *A* reflects the unintentional biasing influence of the primes when control fails. For each participant, we computed estimates of *C* and *A*, separately for Black and White primes of each age and separately for target objects of each valence. In cases of perfect performance ($C=1$), *A* is undefined; thus, we applied an adjustment commonly used in signal-detection analyses (see Snodgrass & Corwin, 1988, for details). Furthermore, because negative *C* estimates violate assumptions of PDP (Jacoby, 1991), we replaced such instances with a value of 0; however, retaining the original (negative) *C* estimates produced nearly identical results.

A 2 (Prime Age) × 2 (Prime Race) × 2 (Target Valence) ANOVA on the automatic estimates yielded a Prime Race main effect, $F(1, 142)=47.70$, $p<.001$, $\eta_p^2=.25$, but no moderation by Target Valence or Prime Age (Fs<1, ps>.49, η_p^2s<.01). A marginal 3-way interaction, $F(1, 142)=3.34$, $p=.070$, $\eta_p^2=.02$, indicated that automatic racial bias was comparable across prime age for negative targets but was slightly weaker after child than adult primes for positive targets. There were no significant effects involving prime race on controlled processing (Fs<1.13, ps>.28, η_p^2s<.01).

Experiment 2

In Experiment 1, we found evidence supporting both negative and positive implicit racial stereotyping toward men and young boys, as predicted by the general-stereotyping hypothesis. We found no support for the negative-stereotyping hypothesis, regardless of prime age: Identification of stereotypic objects was facilitated by Black male faces equally for negative and positive stereotypic objects. Nor did we find support for the prejudice hypothesis: The facilitated identification of negative objects by Black male faces was no greater than the facilitated identification of positive objects by these same faces.

The sequential-priming task used in Experiment 1 was well-suited for testing the general-stereotyping and negative-stereotyping hypotheses. Because this task required conceptual judgments (e.g., categorizing targets as guns or insects), however, it may be better equipped for assessing the activation of semantic associations than the activation of evaluative associations (Judd et al., 2004). Indeed, some evidence suggests that evaluative race bias is weaker when tasks require conceptual rather than evaluative judgments (e.g., categorizing targets as pleasant or unpleasant; Wittenbrink et al., 2001).

We addressed this limitation in Experiment 2 by using a sequential-priming task that assessed evaluative race bias and racial stereotyping in separate trial blocks (cf. Amodio & Devine, 2006). In an evaluation block, participants categorized positive and negative words that were unrelated to racial stereotypes. In a stereotyping block, they categorized words reflecting racial stereotypes about athleticism and (un)intelligence. As before, we anticipated that any observed racial biases would be comparable across prime age. The general-stereotyping hypothesis further predicts race-biased categorization of words associated with negative and positive Black stereotypes on the stereotyping block, whereas the negative-stereotyping hypothesis predicts stronger race-biased categorization of words associated with negative versus positive Black stereotypes on the stereotyping block. Finally, the prejudice hypothesis predicts stronger race-biased categorization of negative versus positive words on the evaluation block.

Method

Aiming to collect as much data as possible by the end of the semester, we obtained data from 91 White undergraduates, who participated for course credit. Two participants' data were lost to computer malfunctions. We also excluded data from 7 participants with below-chance task performance; retaining their data did not meaningfully alter the results, though the otherwise significant Prime Race × Target Word interaction on stereotyping RTs and evaluation RTs became marginally significant (*p*s=.058 and .085, respectively). These exclusions left a final sample of 82 (45 women, 32 men, 5 unreported).

Participants completed a sequential-priming task with two counter-balanced trial blocks. This time they categorized words while ignoring the same face primes from Experiment 1. In an *evaluation* block, participants categorized 12 positive (e.g., *love*) and 12 negative (e.g., *cancer*) words (Gawronski et al., 2008), all irrelevant to racial stereotypes, as ‘pleasant’ or ‘unpleasant.’ In a *stereotyping* block, participants categorized 12 athleticism-related (e.g., *basketball*) and 12 intelligence-related (e.g., *educated*) words (Amodio & Devine, 2006) as ‘physical’ or ‘mental.’ These words reflect common stereotypes of Blacks as athletic and unintelligent (Devine & Elliot, 1995). Because these words were all relatively positive, they could not be categorized based on valence; however, this task is sensitive to both positive (response facilitation for Black-physical pairings) and negative racial stereotypes (response inhibition for Black-mental pairings).

Each trial began with a fixation cross (500 ms), then a face prime (200 ms), and finally a target word (on screen until participants responded). We increased the response deadline to 1 s to account for the greater difficulty of word categorization relative to object categorization (Kiefer, 2001). Eight practice trials preceded each block of 288 randomly-ordered experimental trials.

Results

We report results separately for the stereotyping and evaluation blocks. Table 2 displays descriptive statistics for all prime-target combinations.

RTs. As before, we excluded trials with errors (15.0%) and RTs<100 ms (3.9%). We also excluded trials with RTs>2.5 *SD* from the grand mean in each trial block (1.4%) and log-transformed the remaining RTs; however, we report raw RTs for interpretive ease.

Stereotyping. Supporting the general-stereotyping hypothesis, a 2 (Prime Age) × 2 (Prime Race) × 2 (Target Word) ANOVA yielded a Prime Race × Target Word interaction, $F(1, 81)=6.23$, $p=.015$, $\eta_p^2=.07$. Participants categorized physical words more quickly, $t(81)=2.19$, $p=.048$, $g_{av}=0.09$, and mental words non-significantly more slowly, $t(81)=1.64$, $p=.105$, $g_{av}=0.07$, after Black than White primes. The 3-way interaction was marginally significant, $F(1, 81)=3.34$, *p*=.071, η_p^2=.04; however, the pattern of means suggests that, if anything, racial stereotyping was slightly stronger after child than adult primes.

We also conducted a more focused test of the negative-stereotyping hypothesis by directly comparing the magnitude of positive racial stereotyping (response facilitation for Black-physical pairings: White-physical trials minus Black-physical trials) and negative racial stereotyping (response inhibition for Black-mental pairings: Black-mental trials minus White-mental trials). A paired-samples *t*-test revealed no difference in the magnitude of positive and negative racial stereotyping (t<1, p=.76, g_{av}=0.05); however, the pattern of means suggests that, if anything, positive stereotyping was directionally stronger than negative stereotyping.

Evaluation. Supporting the prejudice hypothesis, there was a Prime Race × Target Word interaction, $F(1, 81)$=6.94, p=.006, η_p^2=.09. Participants categorized negative words non-significantly more quickly, $t(81)$=1.65, p=.104, g_{av}=0.06, and positive words more slowly, $t(81)$=2.43, p=.017, g_{av}=0.08, after Black than White primes. The 3-way interaction was not significant, $F(1, 81)$=2.63, p=.109, η_p^2=.03, but, as with the stereotyping RTs, the pattern of means suggests that racial stereotyping was directionally stronger after child than adult primes.

Error rates. For the error-rate analyses, we excluded trials with RTs<100 ms and RTs exceeding the response deadline, as in Experiment 1.

Stereotyping. In line with the general-stereotyping hypothesis, there was a marginal Prime Race × Target Word interaction, $F(1, 81)$=3.51, p=.065, η_p^2=.04. Participants tended to miscategorize mental words more often, $t(81)$=1.38, p=.173, g_{av}=0.08, and physical words less often, $t(81)$=1.70, p=.093, g_{av}=0.10, after Black than White primes. The 3-way interaction was not significant (F<1, p=.66, η_p^2<.01), indicating comparable (marginal) racial stereotyping across prime age. Additionally, a more focused test of the negative-stereotyping hypothesis that was analogous to the one above revealed that positive and negative racial stereotyping were comparable in magnitude (t<1, p=.92, g_{av}=0.01).

Evaluation. Supporting the prejudice hypothesis, there was a Prime Race × Target Word interaction, F(1, 81)=4.68, p=.033, η_p^2=.06. Participants tended to miscategorize pleasant words more often, t(81)=1.65, p=.103, g_{av}=0.13, and unpleasant words less often, t(81)=1.79, p=.077, g_{av}=0.10, after Black than White primes. The 3-way interaction was not significant (F<1, p=.74, η_p^2<.01), again indicating comparable evaluative race bias across prime age.

PDP estimates. Using the same critical equations described in Experiment 1, we computed analogous estimates of automatic and controlled processing, separately for Black and White primes of each age and separately for the stereotyping block and the evaluation block. We applied an adjustment in cases of perfect performance and replaced negative C estimates with a value of 0; retaining the original (negative) values produced nearly identical results.

Stereotyping. A 2 (Prime Age) × 2 (Prime Race) ANOVA revealed greater automatic estimates after Black than White primes, F(1, 81)=5.00, p=.024, η_p^2=.06, but no moderation by Prime Age (F<1, p=.39, η_p^2<.01). Automatic racial stereotyping was comparable across prime age. Although the Prime Race main effect on control estimates was not significant (F<1, p=.94, η_p^2<.01), there was a marginal Prime Age × Prime Race interaction, F(1, 81)=2.92, p=.091, η_p^2=.04. Controlled processing on the stereotyping block was directionally stronger after Black than White adult primes and directionally weaker after Black than White child primes.

Evaluation. An identical ANOVA revealed greater automatic estimates after Black than White primes, F(1, 81)=5.08, p=.027, η_p^2=.06, but no moderation by Prime Age (F<1, p=.36, η_p^2=.01). Automatic evaluative race bias was comparable across prime age. There were no significant effects involving prime race on controlled processing (Fs<1.84, ps>.18, η_p^2s<.03).

Discussion

We examined whether implicit racial bias toward young boys (Todd et al., 2016) reflects stereotyping, prejudice, or both. In Experiment 1, briefly-presented Black male faces—whether of adults or children—readied the identification of negative (guns) and positive (sports equipment) Black-stereotypic objects. These same Black male faces did not preferentially facilitate the identification of negative more than positive Black-stereotypic objects, nor did they facilitate the identification of negative objects (insects) more generally. Experiment 1's results support the general-stereotyping hypothesis but not the negative-stereotyping or prejudice hypotheses. Granted, the sequential-priming task used in Experiment 1 did not provide an ideal test of the prejudice hypothesis due to its reliance on conceptual judgments. We addressed this limitation in Experiment 2 with a sequential-priming task that was better suited for testing the prejudice hypothesis. Not only did Black male faces ease the categorization of Black-stereotypic words, but they also eased the categorization of negative words more generally. However, these faces did not preferentially ease the categorization of words associated with negative more than positive Black stereotypes. Experiment 2's results, therefore, support the general-stereotyping and prejudice hypotheses but not the negative-stereotyping hypothesis. Collectively, then, our findings provide uniform support for the general-stereotyping hypothesis, some support for the prejudice hypothesis, and no support for the negative-stereotyping hypothesis.

PDP analyses, which estimate the unique contributions of automatic and controlled processing on task performance, further indicated that these effects were driven primarily by automatic (i.e., unintentional) racial biases. There were no significant main effects of prime race and only one marginal effect involving prime race on estimates of controlled processing. That automatic racial biases dominated task performance here accords with prior PDP findings using similar tasks (e.g., Amodio et al., 2004; Payne, 2001, 2005; Todd et al., 2016).

Notably, we found little evidence indicating that racial bias was weaker after child than adult primes (Todd et al., 2016). Indeed, in several instances, the pattern of racial bias was directionally *stronger* after child than adult primes. To provide a more precise (and higher-powered) estimate of the magnitude of racial bias after adult and child primes, we conducted an internal meta-analysis with a random-effects model (Borenstein et al., 2009), using the RT, error rate, and PDP-automatic estimate data from both experiments. For the RTs and error rates, we created indices of racial bias (Kubota & Ito, 2014). For example, the RT metric in Experiment 1 was calculated as follows: (White prime–Black-stereotypic trials minus Black prime–Black-stereotypic trials) + (Black prime–non-stereotypic trials minus White prime–non-stereotypic trials). This analysis revealed small-to-medium-sized racial biases after both adult primes (g=0.30, 95% CI: [0.07, 0.52]) and child primes (g=0.32, 95% CI: [0.11, 0.53]), but no significant difference across prime age (g=-0.001, 95% CI: [-0.09, 0.09], Z<1, p=.99). These meta-analytic results indicate that the racial biases directed toward Black boys relative to White boys are on par with those directed toward Black men relative to White men.

These findings complement prior research documenting negative racial biases toward youth. Importantly, we extend this prior work by suggesting that not only do negative racial stereotypes and evaluations generalize to young boys, but positive racial stereotypes do as well. This latter finding is notable because even positive stereotypes can have negative consequences (Czopp et al., 2015). For example, Black students who excel in positively-stereotyped domains (e.g., athletics) may be actively discouraged from pursuing opportunities in other domains (e.g., academics; Czopp, 2010). One implication of our findings is that young Black boys may be just as susceptible as Black men to these and other detrimental consequences of positive stereotypes.

We acknowledge several limitations of this work, each of which suggests directions for future research. First, we used convenience samples of White undergraduates. It will be important for future work to examine whether our findings generalize to participants of different races and ethnicities. Another limitation is that we used sequential-priming tasks with a response-interference mechanism (Gawronski et al., 2011). Because identical manipulations can produce different effects on tasks that do versus do not rely on response interference (Deutsch & Gawronski, 2009), future research should examine whether our results replicate with tasks that do not rely on response interference (e.g., Payne et al., 2005).

The current work suggests several additional future research directions. First, although we are confident that participants extracted age information from the briefly-presented face primes (see the supplemental experiment in Todd et al., 2016), it is possible that increasing the salience of prime age might attenuate racial biases. Future research could examine this possibility by using full-body prime images (Correll et al., 2002). Alternatively, future studies could direct attention to prime age, for instance, by having participants remember the number of adult and child faces presented in the task (Gawronski et al., 2010).

Second, we focused on whether implicit biases commonly directed toward Black men relative to White men generalize to Black boys relative to White boys. Future studies could expand the scope of this work by investigating whether stereotyping and evaluative biases directed toward men of other racial groups (e.g., Asians) generalize to boys from those groups. Similarly, future research could examine whether the generalization of implicit bias from men to young boys emerges when using a comparison category other than White males.

Third, our findings add to an emerging literature on social cognition at the intersection of race and other social categories (Freeman & Johnson, 2016; Kang & Bodenhausen, 2015). An intersectional approach suggests that people with specific combinations of intersecting identities may be less likely than Black males to elicit negative implicit biases. Future research could examine whether the implicit biases reported here generalize to Black women and girls (Crenshaw et al., 2015; Plant et al., 2011) and to older Black adults (Kang & Chasteen, 2009).

Finally, although we interpret our collective findings as evidence for comparable implicit racial bias across prime age, some of our results point to the presence of implicit age bias (see Supplemental Materials). For instance, in Experiment 1, participants identified Black-stereotypic objects more easily, and non-stereotypic objects less easily, after adult than child primes. That prime race did not moderate these effects could be interpreted as reflecting comparable age bias after Black and White primes. However, because these age biases were inconsistent across experiments, nor were our experiments specifically designed to examine age stereotyping per se, future research will be needed to determine if age biases are comparable across prime race.

In sum, the current research contributes important insights about the nature of implicit racial biases toward young boys. Our results indicate that these biases emerge both in negative and positive semantic associations and in more globally negative evaluative associations. Importantly, though, whether biased associations result in biased downstream behaviors is not inevitable (Bodenhausen et al., 2009). It remains for future work to determine if and when people try to control (and indeed succeed in controlling) these biases toward young Black boys, and whether such efforts differ from efforts to control biases toward Black men.

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Table 1

Mean Response Times, Error Rates, and PDP Estimates by Condition (Experiment 1)

	Prime type			
	Adult primes		Child primes	
Variable	Black primes	White primes	Black primes	White primes
Response time (ms)				
Negative targets				
Guns	263.7 (45.4)	268.4 (46.7)	273.2 (49.6)	278.4 (48.0)
Insects	285.3 (42.4)	284.2 (53.4)	284.0 (42.9)	278.9 (44.0)
Positive targets				
Sports equipment	272.8 (41.5)	274.8 (38.8)	274.6 (41.1)	281.1 (40.0)
Flowers	276.1 (38.7)	271.6 (40.6)	271.4 (41.7)	266.5 (38.0)
Error rate (%)				
Negative targets				
Guns	13.2 (12.8)	14.8 (13.4)	15.3 (13.2)	17.2 (14.1)
Insects	15.0 (12.5)	13.0 (11.8)	13.9 (12.9)	11.7 (12.8)
Positive targets				
Sports equipment	12.2 (11.0)	13.8 (11.8)	12.9 (10.7)	14.4 (12.3)
Flowers	16.2 (12.6)	13.6 (12.5)	14.7 (11.7)	13.9 (12.7)
PDP estimate				
Negative targets				
Automatic	.54 (.19)	.48 (.20)	.47 (.20)	.39 (.19)
Control	.71 (.21)	.71 (.21)	.70 (.22)	.71 (.22)
Positive targets				
Automatic	.58 (.19)	.48 (.21)	.53 (.18)	.48 (.20)
Control	.71 (.20)	.72 (.21)	.72 (.19)	.71 (.21)

Note. Values in parentheses are standard deviations. PDP = process dissociation procedure.

Table 2

Mean Response Times, Error Rates, and PDP Estimates by Condition (Experiment 2)

	Prime type			
	Adult primes		Child primes	
Variable	Black primes	White primes	Black primes	White primes
Response time (ms)				
Stereotyping block				
Physical	566.1 (80.6)	576.2 (83.1)	573.1 (86.8)	581.6 (78.8)
Mental	593.4 (88.6)	594.4 (87.9)	598.8 (80.5)	581.3 (85.8)
Evaluation block				
Negative	571.4 (83.2)	573.4 (72.6)	568.5 (74.7)	576.6 (76.7)
Positive	574.1 (76.3)	571.7 (75.2)	570.7 (75.4)	560.8 (81.1)
Error rate (%)				
Stereotyping block				
Physical	18.5 (11.6)	20.6 (12.8)	20.1 (12.7)	20.4 (12.0)
Mental	18.4 (13.8)	17.8 (14.8)	18.3 (14.3)	16.7 (13.5)
Evaluation block				
Negative	9.8 (9.9)	11.4 (10.4)	10.7 (10.0)	11.0 (10.5)
Positive	12.2 (11.3)	11.2 (11.7)	12.4 (12.2)	10.6 (10.5)
PDP estimate				
Stereotyping block				
Automatic	.49 (.17)	.44 (.20)	.45 (.19)	.43 (.20)
Control	.63 (.21)	.61 (.23)	.61 (.22)	.63 (.21)
Evaluation block				
Automatic	.54 (.20)	.47 (.22)	.53 (.20)	.49 (.20)
Control	.77 (.18)	.76 (.20)	.76 (.19)	.77 (.18)

Note. Values in parentheses are standard deviations. PDP = process dissociation procedure.

Supplemental Material

Pilot Testing of Faces Primes

We recruited 100 participants from Amazon's Mechanical Turk to rate each of the 24 face primes we used in both experiments—6 of each combination of age (adult, child) and race (Black, White)—on the following attributes: *threatening*, *trustworthy*, *attractive*, *typical*, and *unusual* (1 = *not at all*, 7 = *extremely*). We computed mean ratings for each face on each attribute and submitted these ratings to 2 (Age) × 2 (Race) ANOVAs.

These analyses revealed that adult faces were rated as less trustworthy ($p = .018$) and more threatening ($p < .001$) than child faces; however, there were no significant differences in trustworthy or threatening ratings based on race (ps > .54) or on the interaction between age and race (ps > .29). White faces were rated as being marginally more attractive than Black faces ($p = .10$); however, there were no significant differences based on race ($p = .15$) or the interaction between age and race ($p = .74$). Finally, the faces did not differ in unusual or typical ratings based on age (ps > .42), race (ps > .19), or their interaction (ps > .42).

Additional Analyses

In the main text, we reported results that were most pertinent for testing our focal hypotheses. Here, we report additional significant results from those same analyses and from several other analyses.

Experiment 1

RTs. Aside from the significant Prime Race × Target Stereotypicality interaction reported in the main text, there was also a significant Target Stereotypicality main effect, $F(1, 142) = 10.45$, $p = .002$, $\eta_p^2 = .07$, that was moderated by Target Valence, $F(1, 142) = 64.59$, $p < .001$, $\eta_p^2 = .31$. Overall, participants identified negative Black-stereotypic objects more quickly than negative non-stereotypic objects (guns vs. insects), but they identified positive Black-stereotypic objects more slowly than positive non-stereotypic objects (sports objects vs. flowers). Additionally, a significant Prime Age × Target Valence interaction, $F(1, 142) = 4.15$, $p = .043$, $\eta_p^2 = .03$, indicated that participants identified negative objects more quickly after adult than child primes, whereas they identified positive objects equally quickly after adult and child primes. Finally, a significant Prime Age × Target Stereotypicality interaction, $F(1, 142) = 42.57$, $p < .001$, $\eta_p^2 = .23$, indicated that participants identified Black-stereotypic objects more quickly and non-stereotypic objects more slowly after adult primes than after child primes.

We also conducted a preliminary analysis on RTs that included the order of trial blocks (negative block first vs. positive block first) as a between-subjects factor. This analysis revealed that Block Order did not moderate the critical Prime Race × Target Stereotypicality interaction ($F < 1$, $p = .84$, $\eta_p^2 < .01$), nor were there any other higher-order interactions involving Block Order and Prime Race.

Error rates. Aside from the significant Prime Race × Target Stereotypicality interaction reported in the main text, there were also a Target Valence × Target Stereotypicality interaction, $F(1, 142) = 8.37$, $p = .004$, $\eta_p^2 = .06$, a Prime Age × Target Stereotypicality interaction, $F(1, 142) = 26.35$, $p < .001$, $\eta_p^2 = .16$, and a Prime Age × Target Valence × Target Stereotypicality interaction, $F(1, 142) = 5.09$, $p = .026$, $\eta_p^2 = .04$. After adult primes, participants identified positive Black-stereotypic objects more accurately than positive non-stereotypic objects, whereas they were equally accurate in identifying negative Black-stereotypic objects and negative non-stereotypic objects. After child primes, participants identified negative Black-stereotypic objects less accurately than negative non-stereotypic objects, but they identified positive Black-stereotypic objects and positive non-stereotypic objects with comparable accuracy.

A preliminary analysis on error rates that included Block Order revealed that this variable did not moderate the critical Prime Race × Target Stereotypicality interaction ($F < 1$, $p = .54$, $\eta_p^2 < .01$), nor were there any significant higher-order interactions involving Block Order and Prime Race.

PDP estimates. Aside from the significant Prime Race main effect and the marginal 3-way interaction on the automatic estimates reported in the main text, there were also main effects of Prime Age, $F(1, 142) = 26.45$, $p < .001$, $\eta_p^2 = .16$, and Target Valence, $F(1, 136) = 12.81$, $p < .001$, $\eta_p^2 = .08$, as well as a Prime Age × Target Valence interaction, $F(1, 142) = 8.68$, $p = .004$, $\eta_p^2 = .06$. Automatic estimates were higher after adult than child primes for negative targets and directionally higher (albeit less so) for positive targets. There were no significant effects on the control estimates.

A preliminary analysis on automatic estimates that included Block Order revealed that this variable did not moderate the critical Prime Race main effect ($F < 1$, $p = .41$, $\eta_p^2 < .01$). There was, however, a significant Block Order × Prime Age × Prime Race interaction, $F(1, 142) = 4.26$, $p = .041$, $\eta_p^2 = .03$. Decomposing this interaction revealed that, when the positive block came first, there was a marginal Prime Age × Prime Race interaction, $F(1, 71) = 3.93$, $p = .051$, $\eta_p^2 = .05$. The pattern of this interaction indicated that automatic racial bias was slightly more pronounced after adult than child primes. This 2-way interaction was not significant when the negative block came first ($F < 1$, $p = .34$, $\eta_p^2 = .01$).

Experiment 2

Stereotyping block.

RTs. Aside from the significant Prime Race × Target Word interaction reported in the main text, there was also a Target Word main effect, $F(1, 81) = 11.39$, $p = .001$, $\eta_p^2 = .12$.

Participants categorized physical words more quickly than mental words. There was also a Prime Age × Prime Race interaction, $F(1, 81) = 7.93$, $p = .006$, $\eta_p^2 = .09$. Participants responded more quickly after Black than White adult primes, whereas they responded non-significantly more quickly after White than Black child primes.

As in Experiment 1, we also conducted a preliminary analysis on RTs that included the order of trial blocks (stereotyping block first vs. evaluation block first) as a between-subjects factor. This analysis revealed that Block did not moderate the critical Prime Race × Target Word interaction ($F < 1$, $p = .90$, $\eta_p^2 < .01$), nor were there any significant higher-order interactions involving Block Order and Prime Race.

Error rates. Aside from the marginally significant Prime Race × Target Word interaction reported in the main text, there were no other significant effects.

A preliminary analysis on error rates that included Block Order revealed that this variable did not moderate the critical Prime Race × Target Word interaction ($F = 1.40$, $p = .24$, $\eta_p^2 = .02$), nor were there any significant higher-order interactions involving Block Order and Prime Race.

PDP estimates. Aside from the significant Prime Race main effect reported in the main text, there were no other significant effects on the automatic estimates. There were no significant effects on the control estimates.

A preliminary analysis on automatic estimates that included Block Order revealed that this variable did not moderate the critical Prime Race main effect, $F(1, 81) = 2.19$, $p = .142$, $\eta_p^2 = .03$, nor was the Block Order × Prime Age × Prime Race interaction significant ($F = 1.54$, $p = .22$, $\eta_p^2 = .02$).

Evaluation block.

RTs. Aside from the significant Prime Race × Target Word interaction reported in the main text, there was also a significant Prime Age main effect, $F(1, 81) = 3.98$, $p = .049$, $\eta_p^2 = .05$. Participants responded more quickly after child than adult primes.

A preliminary analysis on RTs that included Block Order revealed that this variable did not moderate the critical Prime Race × Target Word interaction ($F = 1.50$, $p = .22$, $\eta_p^2 = .02$), nor were there any significant higher-order interactions involving Block Order and Prime Race.

Error rates. Aside from the significant Prime Race × Target Word interaction reported in the main text, there were no other significant effects.

A preliminary analysis on error rates that included Block Order revealed that this variable did not moderate the critical Prime Race × Target Word interaction ($F < 1$, $p = .59$, $\eta_p^2 < .01$), nor were there any significant higher-order interactions involving Block Order and Prime Race.

PDP estimates. Aside from the significant Prime Race main effect reported in the main text, there were no other significant effects on the automatic estimates. There were no significant effects on the control estimates.

A preliminary analysis on automatic estimates that included Block Order revealed that this variable did not moderate the critical Prime Race main effect ($F < 1$, $p = .35$, $\eta_p^2 = .01$). However, there was a significant Block Order × Prime Age × Prime Race interaction, $F(1, 81) = 4.98$, $p = .028$, $\eta_p^2 = .06$. Decomposing this 3-way interaction revealed that, when the evaluation block came first, there was a significant Prime Age × Prime Race interaction, $F(1, 40) = 4.99$, $p = .031$, $\eta_p^2 = .11$. The pattern of this 2-way interaction indicated that automatic racial bias was stronger after adult than child primes. This 2-way interaction was not significant when the stereotyping block came first ($F < 1$, $p = .37$, $\eta_p^2 = .02$).