

## Implicit Racial Biases in Preschool Children and Adults From Asia and Africa

Miao K. Qian

*Hangzhou Normal University and University of Toronto*

Gail D. Heyman

*University of California,  
San Diego and Zhejiang Normal University*

Paul C. Quinn

*University of Delaware*

Francoise A. Messi

*University of Yaoundé I*

Genyue Fu

*Hangzhou Normal University*

Kang Lee

*University of Toronto and University of California,  
San Diego and Zhejiang Normal University*

This research used an Implicit Racial Bias Test to investigate implicit racial biases among 3- to 5-year-olds and adult participants in China ( $N = 213$ ) and Cameroon ( $N = 257$ ). In both cultures, participants displayed high levels of racial biases that remained stable between 3 and 5 years of age. Unlike adults, young children's implicit racial biases were unaffected by the social status of the other-race groups. Also, unlike adults, young children displayed overt explicit racial biases, and these biases were dissociated from their implicit biases. The results provide strong evidence for the early emergence of implicit racial biases and point to the need to reduce them in early childhood.

Extensive research has investigated racial biases in adults (Baron & Banaji, 2006; Dunham, Baron, & Banaji, 2006, 2007; Dunham, Chen, & Banaji, 2013; Nosek, Banaji, & Greenwald, 2002; Nosek, Hawkins, & Frazier, 2011). This research has revealed that many adults, though not displaying overt racial prejudices, nonetheless show robust implicit racial biases. When left unchecked, these biases can have serious negative consequences at both individual and societal levels (Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Hardin & Banaji, 2013; Williams, Neighbors, & Jackson, 2003; see Pascoe & Smart Richman, 2009, for a review). For example, there are serious consequences for the justice system, for equity of educational opportunities, and for public health (Green et al., 2007).

At what point in development do implicit racial biases first emerge? Almost all the research on this topic has focused on individuals over 6 years of age. This work has demonstrated that implicit racial biases are robust starting at this age (Baron & Banaji, 2006; Dunham, Newheiser, Hoosain, Merrill, & Olson, 2014; Dunham et al., 2006, 2007; Rutland, Cameron, Milne, & McGeorge, 2005). Moreover, the limited research that has been done on younger children suggests that these biases may emerge at an age substantially earlier than 6 years (Anzures, Quinn, Pascalis, Slater, & Lee, 2013; Dunham et al., 2013; Quinn et al., 2013; Xiao et al., 2015). For example, infants as young as 3 months prefer to look at own-race faces over other-race faces (Anzures et al., 2013). Dunham et al. (2013) and Xiao et al. (2015) found that preschoolers categorized racially ambiguous faces with a happy expression as own race and the same faces with an angry expression as other race. However, it is entirely unclear whether children younger than 6 years of

---

This research is supported by grants from the National Institutes of Health (R01 HD046526), the Natural Science and Engineering Research Council of Canada, and the National Science Foundation of China (31371041 and 31470993).

Correspondence concerning this article should be addressed to Kang Lee, Dr. Eric Jackman Institute of Child Study, University of Toronto, 45 Walmer Road, Toronto, ON, Canada M5R 2X2 or Genyue Fu, Department of Psychology, Hangzhou Normal University, No. 58 Haishu Road, Hangzhou, 311121 PR China. Electronic mail may be sent to fugy@zjnu.cn or kang.lee@utoronto.ca.

© 2015 The Authors

Child Development © 2015 Society for Research in Child Development, Inc.  
All rights reserved. 0009-3920/2016/8701-0023

DOI: 10.1111/cdev.12442

age, like older children, have implicit racial biases whereby they would associate positive attributes with own-race faces and negative attributes with other-race faces.

Documenting whether or not implicit racial biases are in place before 6 years of age is important because the preschool period is formative in the development of intergroup attitudes (Bigler & Liben, 2007). Additionally, attempts at reducing racial biases in older children are often ineffective (Aboud, 2013; Bigler, 2013) and may be more effective and longer lasting if they are implemented earlier rather than later in childhood (Killen, Rutland, & Ruck, 2011; Xiao et al., 2015).

The primary goal of this study was to examine implicit racial biases among children from 3 to 5 years of age using a new measure, which we refer to as the Implicit Racial Bias Test (IRBT). This test is based the principles of the Implicit Association Test (IAT). The IAT assesses how quickly positive and negative attributes are associated with own versus other races (Greenwald, McGhee, & Schwartz, 1998; Greenwald, Nosek, & Banaji, 2003). The IRBT also measures positive and negative associations with own- versus other races, but does so by directly looking at associations between faces of different races and positive versus negative attributes that are represented by smiling or frowning faces. The logic is that if participants differ in their response times to smiles versus frowns for different races, then this outcome provides evidence of bias. The primary advantage of this method over the IAT for young children is reduced cognitive demand. This is because children only have to learn one set of associations at a time and can respond with intuitively labeled buttons on a touch screen (Figure 1). In addition, our inclusion of only pictorial stimuli elim-

inated the need for participants to read any of the test materials (Cvencek, Greenwald, & Meltzoff, 2011; Cvencek, Meltzoff, & Greenwald, 2011; Thomas, Burton Smith, & Ball, 2007). The adaptations are similar to what other researchers have done to examine other kinds of implicit association in young children, such as the association between gender and mathematics (Cvencek, Meltzoff, et al., 2011) and between positive words and thin body shape (Thomas et al., 2007).

A second major goal of the present research was to examine how implicit racial biases change over the course of early development and how they compare to adult levels. To date, the evidence suggests that implicit biases are stable after 6 years of age (Baron, 2015; Baron & Banaji, 2006). However, it is unclear whether before 6 years of age, children's implicit racial biases might also be stable or show age-related change (see Baron, 2015, for detailed discussion).

A third major goal of our study was to investigate whether the implicit racial biases of 3- to 5-year-olds were related to their explicit racial biases. In the existing adult literature, there has been debate about whether the two types of biases are dissociated. Some researchers have argued for a linkage between them based on findings of a moderate correlation between explicit and implicit attitude measures generally (Cunningham, Preacher, & Banaji, 2001; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). In contrast, others have suggested that implicit racial biases are dissociated with explicit racial biases due to the fact that adults may suppress explicit racial biases because their overt expression is not socially desirable (Greenwald et al., 1998; Greenwald et al., 2003; Rutland et al., 2005). This suggestion is additionally consis-



Figure 1. Child's view of the screen for the Chinese-Black Implicit Racial Bias Test. Participants responded by tapping a smile or a frown logo, and the only stimuli they were asked to respond to were Chinese faces or Black faces. On "congruent" pairings, participants were told to touch a smile when they saw an own-race Chinese face and to touch a frown when they saw an other-race Black face. On "incongruent" pairings, they were told to touch a frown when they saw a Chinese face and to touch a smile when they saw a Black face.

tent with findings with children older than 6 years of age who also showed dissociations between the two forms of bias (Augoustinos & Rosewarne, 2001; Dunham et al., 2006; McConnell & Leibold, 2001; McGlothlin, Killen, & Edmonds, 2005). Nevertheless, the relation between these biases may be different in young children than in children older than 6 years of age given that young children might not be subject to the same social desirability effects. To date, no evidence exists that addresses this issue.

On the basis of the existing developmental evidence with children older than 6 years of age and adults, we hypothesized that (a) 3- to 5-year-olds would show implicit racial biases and that these biases would be different from adults (implicit racial bias hypothesis); (b) 3- to 5-year-olds would show explicit racial biases that would not be present in adults (explicit racial bias hypothesis); (c) implicit racial biases in adults would be affected by the social status of their own- versus other-race groups, whereas social status would have no effect on either the implicit or explicit biases of 3- to 5-year-olds (social status hypothesis); and (d) implicit racial biases would be correlated with explicit racial biases in 3- to 5-year-olds, but not among adults (implicit and explicit racial bias hypothesis).

### Study 1

In Study 1, we conducted our research in China. We selected China as a starting point because we wanted to address our research questions in a homogeneous racial environment. We were especially interested in the effects of lack of contact with other races on young children's racial biases. In the area of China where we conducted our testing, children are almost exclusively exposed to own-race individuals, as was confirmed by interviews of teachers, administrators, and child participants. Children were first tested on our newly developed measure of implicit bias, the IRBT, and then were given a test of explicit racial bias that was based on the assessment used by Kinzler, Shutts, DeJesus, and Spelke (2009).

### Method

#### Participants

The sample consisted of 213 Chinese participants (100 males, 113 females). Data were collected between October 2013 and January 2014. More detailed age information regarding the participants

is provided in Table 1. Children were recruited from a preschool in a medium-sized city in East China. They were all Han-Chinese, which represents 99.99% of the local population, and from families of all walks of life (median educational level for adult heads of households was high school). Adult participants were undergraduates at a university in the same city without any direct interaction with other-race individuals. The study was approved by the Zhejiang Normal University Research Ethics Review Committee. Adult participants gave written informed consent prior to their participation and were compensated for their participation. Informed consent was obtained from all parents or legal guardians prior to the beginning of the study and oral assent was obtained from all child participants.

#### Materials

The experiments were conducted on a Microsoft Surface Pro with a touch screen, using E-prime 2.0 (Psychology Software Tools, Sharpsburg, PA). The IRBT procedure was based on Cvencek, Greenwald, et al. (2011) except for the following modifications: First, only pictorial stimuli of own-race face (Chinese faces) and other-race faces (Black faces or White faces) were used. Second, smiling faces and frowning face symbols were used as an attribute classification. These were presented in either the left or the right side of the bottom of the screen, with this position randomly determined on each trial for each participant.

The Chinese-Black IRBT involved color photos of 20 Chinese faces (10 females and 10 males) and 20 Black faces (10 females and 10 males). The Chinese-White IRBT involved color photos of 20 Chinese faces (10 females and 10 males) and 20 White faces (10 females and 10 males). All photographs were chosen from an existing face database (Ge et al., 2009), and were standardized at 480 pixels (17 cm) wide and 600 pixels (21 cm) high and had a resolution of 72 pixels per inch. The face images were frontal view without obvious marks such as

Table 1  
*The Distribution of Chinese Participants in Study 1*

Age groups	N (male)	Mean age	Age range
3-year-old	45 (20)	3.7	3.1–5.0
4-year-old	44 (21)	4.7	4.1–6.0
5-year-old	50 (22)	5.8	4.9–6.9
Adults	74 (39)	20.8	17.3–31.8

beards, glasses, or facial makeup. Furthermore, the faces were chosen according to the results of a rating experiment in which all faces in the database were rated in terms of attractiveness and distinctiveness by Caucasian and Chinese adults who did not participate in the current study. We only selected the faces that were judged similarly by Caucasian and Chinese adults, and that were judged by the two groups to be in the average range on these dimensions. All faces were overlaid with the same elliptical shape so that hair was not visible.

### Procedure

Children were tested individually in a quiet room at their school with the child seated within comfortable reach of the laptop computer. Participants received verbal instructions in age-appropriate language. Adults were tested in the same manner as children.

*Implicit racial bias measure.* Participants were assessed for their racial attitudes toward either "Black" or "White," as a between-subject factor. In the Chinese–Black IRBT, there were 8 practice trials and 40 test trials for each of the congruent and incongruent pairings, allowing for familiarization with the procedure. On "congruent" trials, participants were told to touch the smile when they saw a Chinese face and to touch the frown when they saw a Black face, while for "incongruent" trials, they were told to touch the frown when they saw a Chinese face and to touch the smile when they saw a Black face. The Chinese–White IRBT was identical to the Chinese–Black IRBT except that the White faces were used in place of the Black faces. Participants were told to touch the frown when they saw a White face on the congruent trials, and the smile when they saw a White face on the incongruent trials.

*Explicit racial bias measure.* In this task, two sets of three brief scenarios were read to children. In the Chinese–Black set, children were asked to choose either an own-race Chinese adult or an other-race Black adult to be their summer camp counselor in Scenario 1, a swimming coach in Scenario 2, and a tour guide in Scenario 3. For example, in the swimming story they were told, "This summer, your mother will take you to a swimming class. In the class, you could choose one person to coach you to swim, which one would you like to choose?" These particular examples were selected to be culturally appropriate for Chinese children. For each scenario, a photo of a Chinese adult was paired with that of

a Black adult. Photos of different adult pairs were used for the three scenarios. For each scenario, children had to choose either the own-race or the other-race adult. In the Chinese–White set, the scenarios were the same except that the photos of Chinese adult faces were paired with those of White adult faces. All faces were novel and children had not seen them previously.

The implicit measures were always presented first because these were of greatest theoretical interest and because prior research suggests that there are no order effects on these measures (Nosek, Greenwald, & Banaji, 2007).

### Results and Discussion

#### *Implicit Racial Biases*

We used the conventional *D* scores to indicate whether children and adults showed a systematic implicit bias against other-race faces (Black and White) and for own-race faces. The *D* score is the difference between the average of response latencies between contrasted conditions divided by the standard deviation of response latencies across the conditions (Greenwald et al., 2003). Consistent with procedures from previous IAT studies with adults (Greenwald et al., 2003) and children (Cvencek, Greenwald, et al., 2011), data were excluded from participants on the basis of three criteria: (a)  $\geq 10\%$  of responses faster than 300 ms, (b)  $\geq$  error rate of 35%, or (c) average response latency 3 *SD* above the mean response latency for the whole sample. In accord with Greenwald et al. (1998), practice trials were excluded, as were response latencies above 10,000 ms. These criteria excluded 10 (7.2%) children due to excessive errors, leaving 129 children and 74 adults for analysis.

Preliminary analyses revealed no differences in overall latencies as a function of participant gender or order of trial types (congruent first or incongruent first); thus, the data were combined on these two factors in subsequent analyses.

The mean *D* scores and standard errors for different age groups in the Chinese–Black IRBT and Chinese–White IRBT are shown in Figure 2. We performed one-sample *t* tests to compare each age group's mean *D* score against zero (no bias). This analysis revealed that all four age groups showed reliable implicit racial biases against Blacks, all *t*s  $> 4.306$  and *p*s  $< .001$ , and that 4- and 5-year-olds showed significant implicit racial biases against Whites, all *t*s  $> 4.634$  and *p*s  $< .001$ . The biases of 3-year-olds against Whites were not significant,

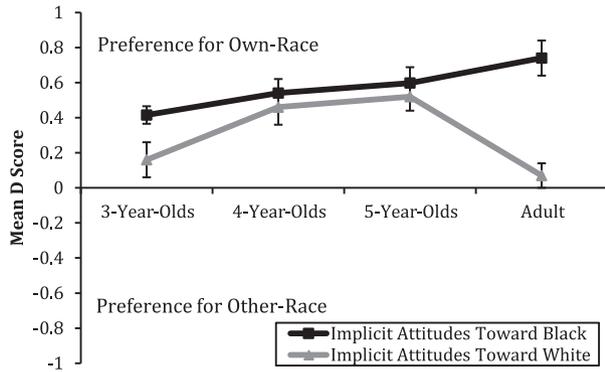


Figure 2. Implicit race attitudes of the four age groups in Study 1. A positive value of *D* indicates a preference for Chinese relative to Black or White. Error bars represent standard errors. The no-bias score is zero.

$p = .150$ , likely due to the relatively greater variability among this age group relative to the older ones.

We conducted a 4 (age groups: 3-, 4-, 5-year-old, and adult)  $\times$  2 (race: Chinese–Black vs. Chinese–White) analysis of variance (ANOVA) and found a main effect of race,  $F(1, 195) = 16.18, p < .001$ , partial  $\eta^2 = .08$ , and a main effect of age group,  $F(3, 195) = 2.84, p = .04$ , partial  $\eta^2 = .04$ . Also, we found an interaction between race and age group,  $F(3, 195) = 5.65, p = .001$ , partial  $\eta^2 = .08$ . Post hoc testing (least significant difference test [LSD]) revealed that this significant interaction was due to the fact that children did not show a significant difference in their implicit racial biases against Blacks and Whites, but adults had a significantly greater bias against Blacks than Whites.

These results provide evidence that Chinese children have implicit racial biases in favor of their own race starting at as early as 3 years of age and that this pattern differed from that observed in adults, who exhibited a bias against Blacks but not against Whites. One likely explanation for the different patterns we observed in young children versus adults is that adults show patterns of bias that reflect the effects of social status. This explanation is especially plausible in light of evidence that social status has a well-documented influence on implicit racial biases (Axt, Ebersole, & Nosek, 2014; Baron, 2015). In order to confirm that there were indeed perceived social status differences in the population, we conducted a new study with a new group of participants that included only Chinese adults. Participants were given two questionnaires we developed to measure the perceived relative social status of Whites, Chinese, and Blacks. The results of both the questionnaires showed that Chi-

nese participants tended to perceive Whites to have higher status than Chinese and Blacks, and Chinese to have higher status than Blacks (all  $t_s > 3.36$  and  $p_s < .01$ ; see online Appendix S1 for details).

### Explicit Racial Biases

Children’s choice of the own-race adult over the other-race adult was coded as 1, and their choice of the other-race adult over the own-race adult was coded as 0 for each of the three scenarios in each condition. The scores were added up and divided by 3 to derive a proportion score with .50 as the no-bias score. Thus, for each participant, we obtained an explicit bias score against Blacks and an explicit bias score against Whites.

Means and standard errors of the explicit proportional bias score for Chinese over Blacks are presented in Figure 3. We performed one-sample *t* tests to compare each age group’s mean explicit score against .5 (no bias) and found that all child groups (all  $t_s > 2.871, p_s < .01$ ), but not adults, showed explicit racial biases against Blacks and Whites.

We conducted a 4 (age groups: 3-, 4-, 5-year-old, and adult)  $\times$  2 (race: Chinese–Black vs. Chinese–White) ANOVA and found a main effect of age group,  $F(3, 195) = 16.01, p < .001$ , partial  $\eta^2 = .20$ . Post hoc testing (LSD) showed no significant difference among 3-, 4-, and 5-year-olds, but did show a significant difference between these age groups and the adult group ( $p_s < .001$ ).

We also compared implicit and explicit attitudes using correlation analysis (see Baron & Banaji, 2006). We combined data from the three child age groups to examine the correlation between implicit and explicit racial biases with partial correlation analyses controlling for age and found no signifi-

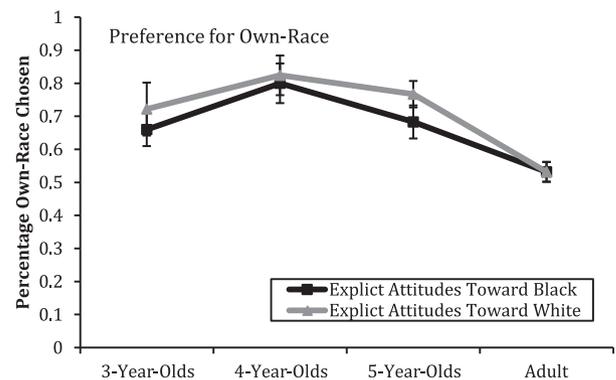


Figure 3. Explicit race preference for the four age groups in Study 1. Error bars represent standard errors. The no-bias score is .50.

cant correlation (all  $ps > .330$ ). We also found no significant correlation between implicit and explicit racial biases in adults ( $p = .39$ ).

In summary, we examined the implicit and explicit biases of Chinese children and adults toward out-groups (Blacks and Whites) and found evidence of early-emerging implicit and explicit racial biases against other-race faces by children as young as 3 years of age. These biases were at similar levels for the three child age groups. In contrast, whereas Chinese adults displayed a similar level of anti-Black bias to children in implicit bias, they showed no implicit bias against Whites, suggesting that adults, but not young children, showed sensitivity to the differences in social status between the two other-race groups. Also, as found in previous studies with adults, adults did not display explicit anti-Black or anti-White biases. Furthermore, as is the case for children older than 6 years of age and adults, the implicit and explicit racial biases in young children were not related to each other.

## Study 2

In Study 1, we discovered evidence of strong racial biases in Chinese 3- to 5-year-olds. However, one possible alternative explanation is that these effects could be driven by the specific face stimuli chosen. For example, the Black faces we selected might, for some reason, be perceived to be negative, whereas the Chinese faces might be perceived positively. In Study 2, we sought to cross-validate these findings by using the exact same face stimuli with Cameroonian children and adults. We selected participants from Cameroon because, as in Study 1, we were especially interested in the effects of lack of contact with other races on young children's racial biases, and Cameroon is a racially homogeneous society. In the area of Cameroon where we conducted our testing, children are almost exclusively exposed to own-race individuals, as was confirmed by interviews of teachers, administrators, and child participants.

A second reason why Cameroon is of particular interest is because it offers an interesting contrast to South Africa, where previous research on implicit racial bias has been conducted (Dunham et al., 2014; Newheiser, Dunham, Merrill, Hoosain, & Olson, 2014). That work suggested that young South African children do not have in-group racial biases. However, the generalizability of this result to other Blacks in Africa can be questioned because

the effect may be due to exposure to Caucasian people or to factors associated with the specific historical context of South Africa. Notably, South Africa had a legacy of apartheid that dominated from 1948 through 1994. In contrast, Cameroonians have been in charge of their country for over 50 years.

We used the same paradigm as that used in Study 1 to assess implicit and explicit racial attitudes of Cameroonian children and adults toward Chinese and Whites.

## Method

### Participants

The sample consisted of 257 Cameroonian participants (129 males, 128 females). Data were collected between April 2014 and October 2014. More detailed information regarding the age distribution of the participants is provided in Table 2. Children were recruited from a preschool in Yaoundé, the political capital city of Cameroon where Blacks makeup more than 99% of the population. Sixty percent of the children's parents belonged to the middle class, 20% to the higher class, and 20% to the lower class. As in Study 1, participants never directly interacted with any individuals from the out-groups we tested (as established by interviews of adults in the community and by child participant reports). Adults were undergraduates at the University of Yaoundé I in Cameroon. Ninety-five percent of the adult participants were from Yaoundé, and 5% were from Douala, the economic capital of Cameroon. The ethics review and consent processes were the same as in Study 1.

### Apparatus, Materials, Procedure, and Analyses

The apparatus, materials, procedure, and analyses were the same as in Study 1, except that (a) the instructions were translated into French; (b) there were two implicit tasks: the Black-Chinese IRBT and the Black-White IRBT; and (c) the same three

Table 2  
*The Distribution of Cameroonian Participants in Study 2*

Age groups	N (male)	$M_{age}$	Age range
3-year-old	62 (30)	3.6	2.9–4.2
4-year-old	66 (30)	4.5	3.8–5.3
5-year-old	70 (42)	5.5	5.1–6.4
Adults	59 (27)	23.1	18.0–29.9

scenarios were used but the choices were between a Black and a Chinese or a White adult. A female Cameroonian graduate student tested all participants.

### Results and Discussion

#### Implicit Racial Biases

We used the same method to obtain  $D$  scores. According to the same criteria described earlier, we excluded 19 (10.6%) children due to excessive errors, leaving 179 children and 59 adults for analysis.

The mean  $D$  scores and standard errors for different age groups in the Black–Chinese IRBT and Black–White IRBT are shown in Figure 4. We performed one-sample  $t$  tests to compare each age group's mean  $D$  score against zero (no bias) and found that all child age groups showed implicit racial bias against Chinese and Whites, all  $t_s > 3.587$  and  $p_s < .001$ , while the adult age group showed implicit racial bias in favor of Chinese and Whites, all  $t_s < -2.652$  and  $p_s < .01$ .

We conducted a 4 (age groups: 3-, 4-, 5-year-old and adult)  $\times$  2 (race: Black–Chinese vs. Black–White) ANOVA and found a main effect of race,  $F(1, 230) = 7.359$ ,  $p = .007$ , partial  $\eta^2 = .031$ . Also, we found a main effect of age group,  $F(3, 195) = 32.261$ ,  $p = .000$ , partial  $\eta^2 = .296$ . Post hoc tests (LSD) showed no significant difference among 3-, 4-, and 5-year-olds, but did show a significant difference between individuals in these age groups and adults ( $p_s < .001$ ).

These results provide evidence that Cameroonian children, like Chinese children, have implicit racial biases in favor of their own race starting as early as

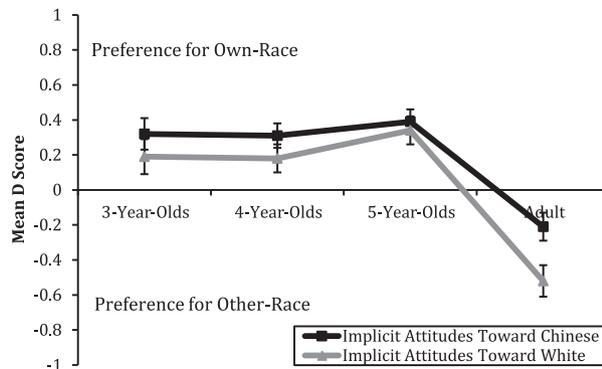


Figure 4. Implicit race attitudes of the four age groups in Study 2. A positive value of  $D$  indicates a preference for Black relative to Chinese or White. Error bars represent standard errors. The no-bias score is zero.

3 years of age, and that these biases reverse to favor Chinese and Whites over Blacks in adulthood. As with our findings with Chinese participants, we attribute the age-related change from early childhood to adulthood in part to social status effects, which were confirmed in an additional study with a new group of adult Cameroonian participants. The results of both questionnaires showed that Cameroonian people tended to perceive Whites to have a higher status than Blacks and Chinese (all  $t_s > 3.36$  and  $p_s < .01$ ), and Chinese to have a marginally significantly higher status than Blacks ( $p = .069$ ). See online Appendix S1 for details.

Our findings with Cameroonian children validated our findings with Chinese children in Study 1 by showing that Cameroonian children responded to the same Black faces more favorably than Chinese faces. Notably, Chinese children in Study 1 showed the reverse pattern for the same stimuli, responding to the same Black faces more negatively than Chinese faces. These findings taken together suggest that the pattern of in-group bias observed in both experiments is not driven by the specific face stimuli chosen.

Interestingly, our findings of in-group implicit racial bias among Cameroonian children contrast with findings in South Africa in which no such bias was seen (Dunham et al., 2014; Newheiser et al., 2014). Further research will be needed to determine whether this difference is best accounted for by the higher levels of racial homogeneity in Cameroon, the historical context of Cameroon, or other factors.

#### Explicit Racial Biases

Means and standard errors of explicit preferences for Black faces over Chinese or White faces are presented in Figure 5. We performed one-sample  $t$  tests to compare each age group's mean explicit score against .5 (no bias) and found that all child groups (all  $t_s > 3.23$  and  $p_s < .05$ ) but not adults showed explicit racial biases against Chinese and Whites.

We conducted a 4 (age groups: 3-, 4-, 5-year-old, and adult)  $\times$  2 (race: Chinese–Black vs. Chinese–White) ANOVA and found a main effect of age group,  $F(3, 195) = 16.014$ ,  $p = .000$ , partial  $\eta^2 = .198$ . Post hoc tests (LSD) showed no significant difference among 3-, 4-, and 5-year-olds, but did show a significant difference between individuals in these age groups and adults ( $p_s < .01$ ).

We also examined the relation between implicit and explicit attitudes using correlation analysis. We combined data from the three child age groups to

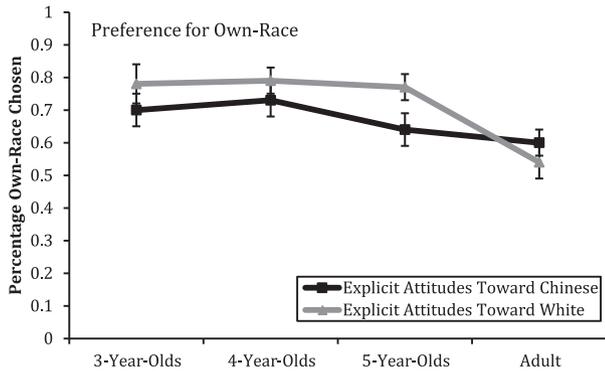


Figure 5. Explicit race preference in the four age groups in Study 2. Error bars represent standard errors. The no-bias score is .50.

examine the correlation between implicit and explicit racial biases with partial correlation analysis controlling for age and found no significant correlation (all  $p$ s > .103). We also found no significant correlation between implicit and explicit racial biases in adults ( $p = .21$ ).

Thus, the results with Cameroonian children replicated those with Chinese 3- to 5-year-olds in Study 1, suggesting cross-cultural generality of the early emergence of both implicit and explicit racial biases. Like the Chinese children in Study 1, the racial biases of Cameroonian children were unaffected by the social status of the other-race groups. However, unlike Cameroonian children, Cameroonian adults displayed implicit racial biases in favor of the other-race Chinese faces and White faces, suggesting the impact of social status on implicit racial biases. Also, unlike Cameroonian children, Cameroonian adults showed no overt explicit racial biases against other-race faces. Furthermore, similar to the findings of previous adult studies (Baron & Banaji, 2006; Dunham et al., 2006), the implicit and explicit racial biases were dissociated with each other in both Cameroonian children and adults.

### General Discussion

In the present research, we examined the following four hypotheses: (a) the implicit racial bias hypothesis that 3- to 5-year-olds would show implicit racial biases and that these biases would be different from adults, (b) the explicit racial bias hypothesis that 3- to 5-year-olds would show explicit racial biases that would not be present in adults, (c) the social status hypothesis that only the implicit racial biases of adults would be affected by the relative social status of their own- versus other-race groups, and

(d) the implicit and explicit racial bias hypothesis that implicit racial biases would be correlated with explicit racial biases in 3- to 5-year-olds, but not among adults. As described next our results are consistent with the first three hypotheses, but not the final one.

Consistent with the implicit racial bias hypothesis, we found robust implicit racial biases against other races among 3- to 5-year-old children on an IRBT in which three target race groups (Chinese, Black, and White) and two participant populations (Chinese and Cameroonians) were included. These results extend previous findings demonstrating implicit racial bias among Caucasian children 6 years of age and older (Baron & Banaji, 2006; Dunham et al., 2006, 2013; Newheiser & Olson, 2012). No age differences were found in the implicit biases between 3-, 4-, and 5-year-olds. Given our evidence of robust and stable implicit racial biases between 3 and 5 years of age, we speculate that such biases may emerge in toddlerhood or even earlier.

Consistent with the explicit racial bias hypothesis, the present study revealed that 3- to 5-year-olds in China and Cameroon had strong biases against other-race groups. As was the case with their implicit racial biases, there were no significant age effects over this period. Our findings contrast with the pattern observed in children older than 6 years of age, whose explicit biases underwent a steady decline with increased age (Baron & Banaji, 2006; Castelli, De Amicis, & Sherman, 2007; Dunham et al., 2006; Rutland et al., 2005; see Raabe & Beelmann, 2011, for a meta-analysis). Consistent with prior work on adult explicit bias (Baron & Banaji, 2006; Dunham et al., 2006; Dunham et al., 2013; Rutland et al., 2005; see Raabe & Beelmann, 2011, for a meta-analysis), we found that adults did not show explicit racial biases.

Consistent with the social status hypothesis, we found that young children's implicit racial biases were insensitive to relative social status, but that adult implicit racial biases were sensitive to relative social status. This finding contrasts with the apparent sensitivity to the social status of other races observed in children older than 6 years of age (Dunham et al., 2006; Dunham et al., 2013; Dunham et al., 2014; Newheiser & Olson, 2012; Newheiser et al., 2014; Shutts, Kinzler, Katz, Tredoux, & Spelke, 2011). For example, in Japan, children's implicit racial bias against Caucasians declined with age but their bias against Africans remained robust and persistent (Dunham et al., 2006). One possibility is that the 3- to 5-year-olds in our experiments might have insufficient knowledge

about social status differences between their own-race group and the other-race groups. In contrast, adults clearly have such knowledge, as was evident from the results of our social status questionnaires, and these patterns were consistent with their implicit biases. For example, in China, Chinese adults perceived Whites to have higher social status than both Chinese and Blacks, and Chinese to have greater social status than Blacks. Their implicit biases matched such social status differences, with implicit racial biases in evidence against Blacks, but not Whites. In contrast, Cameroonian adults perceived Whites to have higher social status than both Chinese and Blacks, and Chinese to have higher social status than Blacks. The implicit racial biases of Cameroonian adults also reflected the social status differences among the three racial groups; there was positive implicit racial bias for both Whites and Chinese against own race.

Taken together with previous findings (Baron, 2015; Dunham et al., 2013; for a review, see Dunham, Baron, & Banaji, 2008), our research suggests that while implicit racial biases have an early developmental emergence, such biases may not be sensitive to the social status of different racial groups until later in development, perhaps resulting from children's increased exposure to the world beyond their own culture via formal schooling and informal learning (e.g., reading). It is also possible that the timing of status effects may emerge earlier in societies in which status differences between groups are highly salient as they are in South Africa (see Olson, Shutts, Kinzler, & Weisman, 2012, for evidence that South African children as young as 3 years of age may perceive Caucasians to have higher social status than Blacks). Future research is needed to directly study the relation between children's recognition of social status and the development of implicit racial biases, as well as other factors such as exposure to the media and classroom curricula that might help explain differences between patterns of bias observed in young children versus adults. It will also be important to assess whether the results from our college adults generalize to other adults (e.g., parents).

Although we found strong implicit and explicit racial biases among 3- to 5-year-old children in China and Cameroon, we did not find evidence supporting the implicit and explicit racial bias hypothesis. Specifically, we found no evidence that the two biases were significantly related to each other in either study. This lack of relation is consistent with prior studies with children older than 6 years of age (Augoustinos & Rosewarne, 2001; Dunham et al.,

2006; McConnell & Leibold, 2001; McGlothlin et al., 2005). One possible interpretation of the lack of correlation between implicit and explicit biases in older children and adults is that once children are aware of the social desirability of appearing racially unbiased, they suppress the expression of their biases (Greenwald et al., 1998; Greenwald et al., 2003; Rutland et al., 2005). However, this explanation is very unlikely to explain the lack of correlation between these measures in children in the present study given that they displayed strong negative biases against other races both implicitly and explicitly. This observation raises the possibility that different kinds of social experience may affect the formation of the two forms of racial bias differently. For example, implicit racial biases may be influenced more by children's direct perceptual experiences (Xiao et al., 2015), whereas explicit racial biases may be more influenced by socialization processes (e.g., Adult  $\times$  Child interaction, or peer interaction).

Collectively, our findings of early implicit and explicit racial biases run counter to the suggestion by Allport (1979) that such biases emerge only after an extended period of socialization. Our findings are more consistent with the suggestion by Aboud (2013) that such biases are strong even in early childhood. Future research with additional measures will be needed to understand the extent to which the patterns we observed here can be explained in terms of different developmental theories that have been proposed. For example, it has been suggested that racial feature saliency (Bigler & Liben, 2007), asymmetrical exposure to same race versus other-race faces (Xiao et al., 2015), cognitive maturity (Aboud, 2013), and self-esteem and in-group identification (Cvencek, Greenwald & Meltzoff, 2013; Nesdale, 1999) may play important roles in engendering the development of implicit and explicit biases. Future research may assess children on these factors along with their implicit and explicit racial biases to test the validity of the predictions based on these theoretical proposals.

The present research also makes a methodological contribution to the study of implicit biases in young children. In developing the IRBT, we adapted it in several ways to reduce the cognitive demands of the procedure. Some of these ways, such as using pictures rather than words and reducing the number of trials, have been used in previous studies (Cvencek, Greenwald, et al., 2011; Cvencek, Meltzoff, et al., 2011). What is new in our research is that children could respond on a touch screen and only have to remember to classify items associated with the theoretical construct

of interest (in this case, race), thereby dramatically reducing the cognitive demands of the task. Furthermore, through the use of this method with Cameroonian and Chinese 3- to 5-year-olds, we further validated the effectiveness of our procedure by showing that the measure of implicit associations between races and attitudes was not influenced by idiosyncratic characteristics of the face stimuli chosen: When responding to the same faces, Cameroonian children showed implicit biases against Chinese faces over Black faces, whereas Chinese children showed implicit biases against Black faces over Chinese faces. The mirror pattern of response seen in the two races of children indicates that 3- to 5-year-olds in our study were responding to the general racial attributes of the faces, rather than to individual-specific facial characteristics (e.g., attractiveness). It will be of interest in future research to explore other uses of this methodology in more diverse populations and to examine how it might be used to assess other types of implicit biases (e.g., gender biases).

In summary, the present research along with previous investigations paints a picture of early emerging implicit racial biases that are robust and present in diverse cultures. These biases are unrelated to explicit biases and over time show sensitivity to relative social status. Our results point to the need to design early interventions as early as 3 years of age that can address these biases before they become reinforced and entrenched.

## References

- Aboud, E. F. (2013). What are they thinking? The mystery of young children's thoughts on race. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 332–335). New York, NY: Oxford University Press.
- Allport, G. W. (1979). *The nature of prejudice*. New York, NY: Basic Books.
- Anzures, G., Quinn, P. C., Pascalis, O., Slater, A. M., & Lee, K. (2013). Development of own-race biases. *Visual Cognition*, *21*, 1165–1182. doi:10.1080/13506285.2013.821428
- Augoustinos, M., & Rosewarne, D. L. (2001). Stereotype knowledge and prejudice in children. *British Journal of Developmental Psychology*, *19*, 143–156. doi:10.1348/0261510011165912
- Axt, J. R., Ebersole, C. R., & Nosek, B. A. (2014). The rules of implicit evaluation by race, religion, and age. *Psychological Science*, *25*, 1804–1815. doi:10.1177/0956797614543801
- Baron, A. S. (2015). Constraints on the development of implicit intergroup attitudes. *Child Development Perspectives*, *9*, 50–54. doi:10.1111/cdep.12105
- Baron, A. S., & Banaji, M. R. (2006). The development of implicit attitudes evidence of race evaluations from ages 6 and 10 and adulthood. *Psychological Science*, *17*, 53–58. doi:10.1111/j.1467-9280.2005.01664.x
- Bigler, R. S. (2013). Understanding and reducing social stereotyping and prejudice among children. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 327–331). New York, NY: Oxford University Press.
- Bigler, R. S., & Liben, L. S. (2007). Developmental intergroup theory explaining and reducing children's social stereotyping and prejudice. *Current Directions in Psychological Science*, *16*, 162–166. doi:10.1111/j.1467-8721.2007.00496.x
- Bigler, R. S., Spears Brown, C., & Markell, M. (2001). When groups are not created equal: Effects of group status on the formation of intergroup attitudes in children. *Child Development*, *72*, 1151–1162. doi:10.1111/1467-8624.00339
- Castelli, L., De Amicis, L., & Sherman, S. J. (2007). The loyal member effect: On the preference for ingroup members who engage in exclusive relations with the ingroup. *Developmental Psychology*, *43*, 1347–1359. doi:10.1037/0012-1649.43.6.1347
- Cunningham, W. A., Preacher, K. J., & Banaji, M. R. (2001). Implicit attitude measures: Consistency, stability, and convergent validity. *Psychological Science*, *12*, 163–170. doi:10.1111/1467-9280.00328
- Cvencek, D., Greenwald, A. G., & Meltzoff, A. N. (2011). Measuring implicit attitudes of 4-year-olds: The preschool implicit association test. *Journal of Experimental Child Psychology*, *109*, 187–200. doi:10.1016/j.jecp.2010.11.002
- Cvencek, D., Greenwald, A. G., Meltzoff, A. N. (2013). *Implicit self-esteem and self concepts in preschoolers*. Unpublished manuscript. University of Washington, Seattle.
- Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2011). Math-gender stereotypes in elementary school children. *Child Development*, *82*, 766–779. doi:10.1111/j.1467-8624.2010.01529.x
- Dunham, Y., Baron, A. S., & Banaji, M. R. (2006). From American city to Japanese village: A cross-cultural investigation of implicit race attitudes. *Child Development*, *77*, 1268–1281. doi:10.1111/j.1467-8624.2006.00933.x
- Dunham, Y., Baron, A. S., & Banaji, M. R. (2007). Children and social groups: A developmental analysis of implicit consistency in Hispanic Americans. *Self and Identity*, *6*, 238–255. doi:10.1080/15298860601115344
- Dunham, Y., Baron, A. S., & Banaji, M. R. (2008). The development of implicit intergroup cognition. *Trends in Cognitive Sciences*, *12*, 248–253. doi:10.1016/j.tics.2008.04.006
- Dunham, Y., Chen, E. E., & Banaji, M. R. (2013). Two signatures of implicit intergroup attitudes: Developmental invariance and early enculturation. *Psychological Science*, *24*, 860–868. doi:10.1177/0956797612463081

- Dunham, Y., Newheiser, A., Hoosain, L., Merrill, A., & Olson, K. R. (2014). From a different vantage: Intergroup attitudes among children from low- and intermediate-status racial groups. *Social Cognition, 32*, 1–21. doi:10.1521/soco.2014.32.1.1
- Ge, L., Zhang, H., Wang, Z., Quinn, P. C., Pascalis, O., Kelly, D., & Lee, K. (2009). Two faces of the other-race effect: Recognition and categorization of Caucasian and Chinese faces. *Perception, 38*, 1199–1210. doi:10.1167/8.6.257
- Green, A. R., Carney, D. R., Pallin, D. J., Ngo, L. H., Raymond, K. L., Iezzoni, L. I., & Banaji, M. R. (2007). Implicit bias among physicians and its prediction of thrombolysis decision for Black and White patients. *Journal of General Internal Medicine, 22*, 1231–1238. doi:10.1007/s11606-007-0258-5
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464–1480. doi:10.1037/0022-3514.74.6.1464
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*, 197–216. doi:10.1037/0022-3514.85.2.197
- Greenwald, A. G., Poehlman, T. A., Uhlmann, E. L., & Banaji, M. R. (2009). Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity. *Journal of Personality and Social Psychology, 97*, 17–41. doi:10.1037/a0015575
- Hardin, C. D., & Banaji, M. R. (2013). The nature of implicit prejudice: Implications for personal and public policy. In E. Shafir (Ed.), *The behavioral foundations of public policy* (pp. 13–31). Princeton, NJ: Princeton University Press.
- Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the Implicit Association Test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*, 1369–1385. doi:10.1177/0146167205275613
- Killen, M., Rutland, A., & Ruck, M. D. (2011). Promoting equity, tolerance, and justice in childhood. *Social Policy Report, 25*, 1–33.
- Kinzler, K. D., Shutts, K., DeJesus, J., & Spelke, E. S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition, 27*, 623–634. doi:10.1521/soco.2009.27.4.623
- McConnell, A. R., & Leibold, J. M. (2001). Relations among the Implicit Association Test, discriminatory behavior, and explicit measures of racial attitudes. *Journal of Experimental Social Psychology, 37*, 435–442. doi:10.1006/jesp.2000.1470
- McGlothlin, H., Killen, M., & Edmonds, C. (2005). European-American children's intergroup attitudes about peer relationships. *British Journal of Developmental Psychology, 23*, 227–250. doi:10.1348/026151005x26101
- Nesdale, D. (1999). Developmental changes in children's ethnic preferences and social cognitions. *Journal of Applied Developmental Psychology, 20*, 501–519. doi:10.1016/S0193-3973(99)00012-X
- Newheiser, A. K., Dunham, Y., Merrill, A., Hoosain, L., & Olson, K. R. (2014). Preference for high status predicts implicit outgroup bias among children from low-status groups. *Developmental Psychology, 50*, 1081–1090. doi:10.1037/t03782-000
- Newheiser, A. K., & Olson, K. R. (2012). White and Black American children's implicit intergroup bias. *Journal of Experimental Social Psychology, 48*, 264–270. doi:10.1016/j.jesp.2011.08.011
- Nosek, B. A., Banaji, M., & Greenwald, A. G. (2002). Harvesting implicit group attitudes and beliefs from a demonstration web site. *Group Dynamics: Theory, Research, and Practice, 6*, 101–115. doi:10.1037//1089-2699.6.1.101
- Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The Implicit Association Test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Automatic processes in social thinking and behavior* (pp. 265–292). New York, NY: Psychology Press.
- Nosek, B. A., Hawkins, C. B., & Frazier, R. S. (2011). Implicit social cognition: From measures to mechanisms. *Trends in Cognitive Sciences, 15*, 152–159. doi:10.1016/j.tics.2011.01.005
- Olson, K. R., Shutts, K., Kinzler, K. D., & Weisman, K. G. (2012). Children associate racial groups with wealth: Evidence from South Africa. *Child Development, 83*, 1884–1899. doi:10.1111/j.1467-8624.2012.01819.x
- Pascoe, E. A., & Smart Richman, L. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin, 135*, 531–554. doi:10.1037/a0016059
- Quinn, P. C., Anzures, G., Lee, K., Pascalis, O., Slater, A., & Tanaka, J. W. (2013). On the developmental origins of differential responding to social category information. In M. R. Banaji & S. A. Gelman (Eds.), *Navigating the social world: What infants, children, and other species can teach us* (pp. 286–291). New York, NY: Oxford University Press.
- Raabe, T., & Beelmann, A. (2011). Development of ethnic, racial, and national prejudice in childhood and adolescence: A multinational meta-analysis of age differences. *Child Development, 82*, 1715–1737. doi:10.1111/j.1467-8624.2011.01668.x
- Rutland, A., Cameron, L., Milne, A., & McGeorge, P. (2005). Social norms and self-presentation: Children's implicit and explicit intergroup attitudes. *Child Development, 76*, 451–466. doi:10.1111/j.1467-8624.2005.00856.x
- Shutts, K., Kinzler, K. D., Katz, R. C., Tredoux, C., & Spelke, E. S. (2011). Race preferences in children: Insights from South Africa. *Developmental Science, 14*, 1283–1291. doi:10.1111/j.1467-7687.2011.01072.x
- Thomas, S., Burton Smith, R., & Ball, P. (2007). Implicit attitudes in very young children: An adaptation of the IAT. *Current Research in Social Psychology, 13*, 75–85.
- Williams, D. R., Neighbors, H. W., & Jackson, J. S. (2003). Racial/ethnic discrimination and health: findings from

community studies. *American Journal of Public Health*, 93, 200–208. doi:10.2105/AJPH.93.2.200

Xiao, W. S., Fu, G., Quinn, P. C., Qin, J., Tanaka, J. W., Pascalis, O., & Lee, K. (2015). Individuation training with other-race faces reduces preschoolers' implicit racial bias: A link between perceptual and social representation of faces in children. *Developmental Science*, 18, 655–663. doi:10.1111/desc.12241

### Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

**Appendix S1.** Perceived Social Status Differences Among Different Races in Chinese Adults