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Abstract

Long traditions in the social sciences have emphasized the gradual internalization of intergroup attitudes and the putatively more basic tendency to prefer the groups to which one belongs. In four experiments ($N = 883$) spanning two cultures and two status groups within one of those cultures, we obtained new evidence that implicit intergroup attitudes emerge in young children in a form indistinguishable from adult attitudes. Strikingly, this invariance from childhood to adulthood holds for members of socially dominant majorities, who consistently favor their in-group, as well as for members of a disadvantaged minority, who, from the early moments of race-based categorization, do not show a preference for their in-group. Far from requiring a protracted period of internalization, implicit intergroup attitudes are characterized by early enculturation and developmental invariance.

Keywords

intergroup bias, prejudice, cognitive development, social development, cultural differences, attitudes, social cognition

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Intergroup conflict is a pervasive aspect of modern and premodern societies, and understanding its psychological origins is an essential precursor to addressing its often devastating consequences. Across a diversity of fields, scholars have repeatedly suggested two psychological factors as primary drivers of intergroup conflict: in-group preference and status-based enculturation. Individuals manifest a putatively basic tendency to prefer and favor the social groups to which they belong, that is, their *in-groups* (Allport, 1954; Brewer, 1979; Levine & Campbell, 1972; Tooby & Cosmides, 1988). Such preferences are observed in adults and children on multiple measures and for many types of groups, including novel groups created on the spot in the lab (Brewer, 1979; Dunham, Baron, & Carey, 2011). These findings demonstrate that in-group bias need not depend on a history of prior learning. However, other research has revealed a constraint on this otherwise ubiquitous pattern: Members of socially disadvantaged groups do not consistently demonstrate in-group preference, especially on measures of implicit social cognition thought to tap lower-level evaluative associations (Bettencourt, Dorr, Charlton, & Hume, 2001; Clark & Clark, 1947; Dunham, Baron, & Banaji,

2007; Jost, Banaji, & Nosek, 2004; Mullen, Brown, & Smith, 1992; Nosek, Banaji, & Greenwald, 2002). Thus, social status appears to counteract what is otherwise a general tendency toward in-group preference, presumably through a protracted process of social tuning and enculturation to local norms (Bandura, 1977; Davey, 1983; Devine, 1989).

One path to understanding the interplay between in-group preference and status-based enculturation is to focus on their origins. When does each emerge, and what are their relative contributions across development? The development of intergroup attitudes has been a topic of long-standing interest (see reviews in Aboud, 1988; Bigler & Liben, 2006). A recent large-scale meta-analysis (Raabe & Beelmann, 2011) found an initial increase in explicit intergroup bias between ages 4 and 6, followed by a gradual decline through adolescence. Historically, this often-observed pattern of declining intergroup bias in

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late childhood has been interpreted in a neo-Piagetian fashion as reflecting the impact of child-specific cognitive limitations (e.g., egocentrism) that are overcome over normative development (Aboud, 1988; Katz, 1983). Unfortunately, this interpretation is difficult to square with the prevalence of subtler forms of implicit or automatic intergroup bias in adults (e.g., Nosek et al., 2002), and the few studies that have examined implicit attitudes in children have found that the reduction in self-reported intergroup bias is not mirrored at the implicit level. Instead, implicit attitudes appear to be relatively stable between elementary school and adulthood (Baron & Banaji, 2006; Dunham, Baron, & Banaji, 2006, 2007; Rutland, Cameron, Milne, & McGeorge, 2005). One interpretation of this pattern is that a combination of self-presentational concerns and the emergence of an explicit egalitarian moral stance drive revisions of explicit intergroup attitudes but leave more basic group-related associations unchanged (Dunham, Baron, & Banaji, 2008).

The current inquiry focuses on the development of implicit race bias, and in particular, the relative contribution of in-group preference and status-based enculturation across the life span. We focus on race because previous research has shown that preschool-age children become able to categorize along racial lines, show social preferences with respect to race categories, and begin to express identification with their racial in-group (see reviews in Aboud, 1988; Cristol & Gimbert, 2008). Thus, race is a relatively early-emerging and salient form of social categorization that eventually comes to feature prominently in myriad forms of social stratification and discrimination.

Although the development of race bias has received attention, the majority of prior studies have employed relatively small sample sizes and restricted age ranges (often just two age groups separated by several years), so that the precise identification of age-related trends was not possible. Also, no studies thus far have investigated implicit race bias in children under the age of 6, a critical gap given that race emerges as a socially relevant category at 3 to 4 years of age. Furthermore, studies examining children have generally employed different measures than those examining adults (e.g., simple forced-choice preference tasks with children vs. sophisticated implicit measures with adults), making direct comparisons across these literatures problematic. Finally, little research has compared socially advantaged and disadvantaged populations or different cultures, which limits the ability to pinpoint the role of enculturation and to establish the generality of findings. In the present study, we sought to overcome these limitations through a large-scale inquiry ($N = 883$) spanning four experiments that encompassed two participant populations in the United States, one socially advantaged and one more socially disadvantaged, as well as one participant population in Taiwan.

Specifically, we addressed the following two questions: When does in-group preference emerge, relative to the age at which race categories are acquired? Is in-group preference a more basic response that emerges prior to the internalization of social status, or is the internalization of status equally basic and thus equally early emerging? We examined groups that vary in status within a single culture as well as groups across distinct cultures so that our results would be more likely to be generalizable. To circumvent confounds with developments in social awareness and self-presentational concern, we employed an indirect measure of attitude that does not rely on self-report. In prior research (Hugenberg & Bodenhausen, 2004), White American adults were shown a series of computer-generated, racially ambiguous faces designed to be intermediate between prototypical White and Black facial morphology. The facial expressions were varied such that each face appeared in happy and angry expressions (Fig. 1); participants categorized the faces as White or Black in a forced-choice manner. Results demonstrated that angry faces were more likely to be categorized as Black, whereas happy faces were more likely to be categorized as White. Crucially, this tendency could be predicted from implicit anti-Black attitude, as measured by the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998)—a relationship that has been replicated several times (Dunham, 2011; Hutchings & Haddock, 2008). Categorization performance was not related to self-reported bias, which suggests that the effect is rooted in an automatic association between anger and social categories.

An advantage of this task was its suitability for young children, for whom lengthy experimental measures involving reaction times may not be appropriate (Ratcliff, Love, Thompson, & Opfer, 2012). For example, measures that centrally implicate executive-function capacities (e.g., task switching; Klauer, Schmitz, Teige-Mocigemba, & Voss, 2010), such as the IAT, may be unreliable developmentally (e.g., Davidson, Amso, Anderson, & Diamond, 2006). Thus, in addition to pursuing the theoretical goals already highlighted, we hoped to contribute a new implicit measure to the literature on the development of intergroup attitudes by demonstrating a straightforward form of intergroup bias, namely, a link between perception of facial affect and race-based categorization.

Experiment 1

Method

Participants. We tested 263 White American children ages 3 to 14 ($M = 7.3$ years, $SD = 2.7$) and 79 adults recruited from a local museum in the greater Boston area and from lab-related research subject pools. A single experimenter tested participants alone in a quiet room.

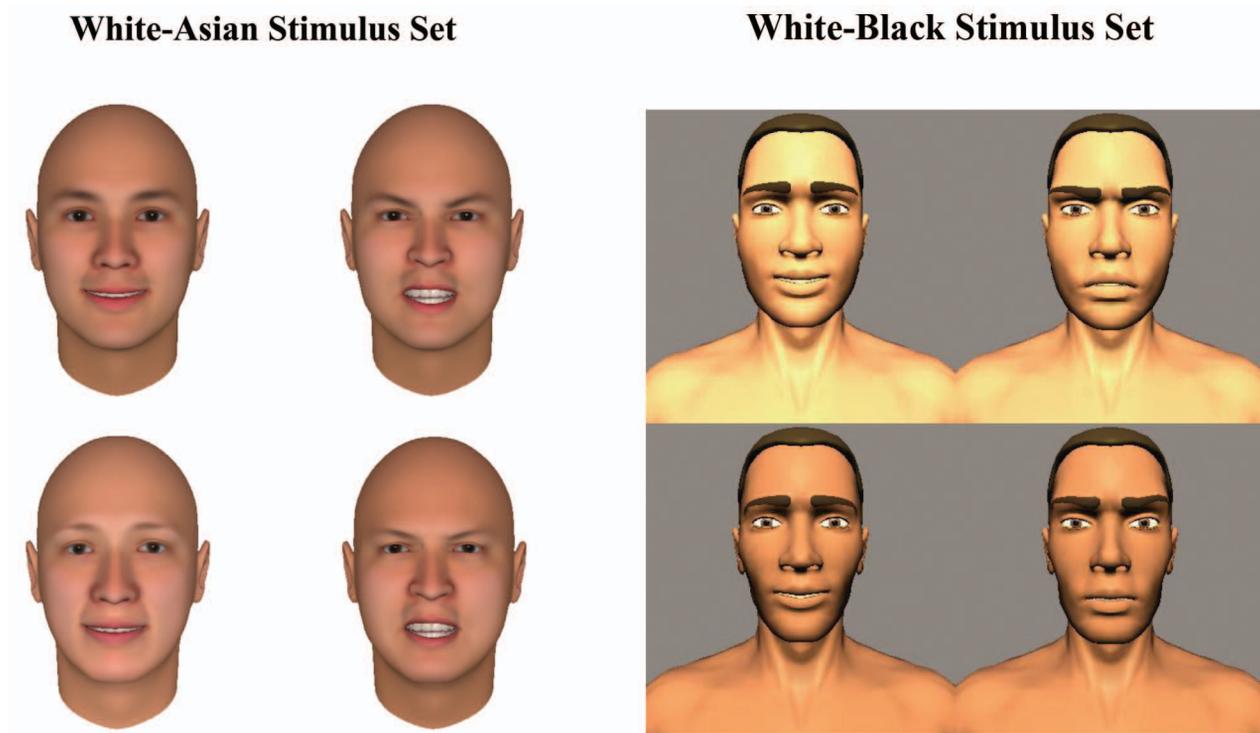


Fig. 1. Examples of the ambiguous race stimuli used in the experiments. The White-Black set of faces (Experiments 1 and 4) was from Hugenberg and Bodenhausen (2004), and was used with permission; the White-Asian set (Experiments 2 and 3) was produced by the first author.

Materials. The materials were computer-generated male faces that had been designed in prior research (Hugenberg & Bodenhausen, 2004) to be intermediate between prototypical White and Black faces and to display unambiguous positive or negative affect (see Fig. 1; for the use of similar stimuli, see Hutchings & Haddock, 2008; Stepanova & Strube, 2012; Todorov, Said, Engell, & Oosterhof, 2008). There were 15 unique faces and two versions of each face, one with positive affect (happy) and one with negative affect (angry), for a total of 30 target stimuli. Pretesting confirmed that the faces were racially ambiguous and displayed the intended affect (Hugenberg & Bodenhausen, 2004).

Procedure. Participants were told that they would view faces on the computer screen and categorize them as Black or White by pressing one of two labeled response keys. The procedure began with a *pretest training phase*, in which participants categorized 4 clear exemplars of Black and White faces. This was followed by the *test phase*, which consisted of 30 trials. On each trial, 1 of the 30 target stimuli (15 happy, 15 angry) was displayed, and participants categorized it as Black or White. Stimuli were presented in random order. The procedure took approximately 5 min.

Analysis. To respect the nested nature of the data (trials nested within participants) and the dichotomous outcome (categorization as Black or White), we analyzed the data via multilevel logistic regression (Guo & Zhao, 2000), modeling the probability of categorizing a face as Black, with effect sizes expressed as odds ratios (ORs) indicating the increased probability of categorizing an angry face as Black as opposed to White. In addition to including our primary variables of facial expression (angry or happy) and participant's age, our model controlled for mean image luminosity, which varied somewhat across the faces.

Results

As a whole, angry faces were 1.32 times as likely to be categorized as Black as were happy faces, 95% confidence interval (CI) = [1.20, 1.45], $\beta = 0.28$, $SE = 0.048$, $p < .001$. Crucially, no interaction between age and facial expression was present, $\beta = 0.004$, $SE = 0.009$, $p = .70$, which indicated that the strength of this effect was consistent across the age ranges examined (Fig. 2a). Indeed, the effect of facial expression was significant in an analysis including just the 3- and 4-year-old participants ($n = 64$), $OR = 1.22$, 95% CI = [1.01, 1.50], $\beta = 0.21$, $SE = 0.10$, $p = .04$.

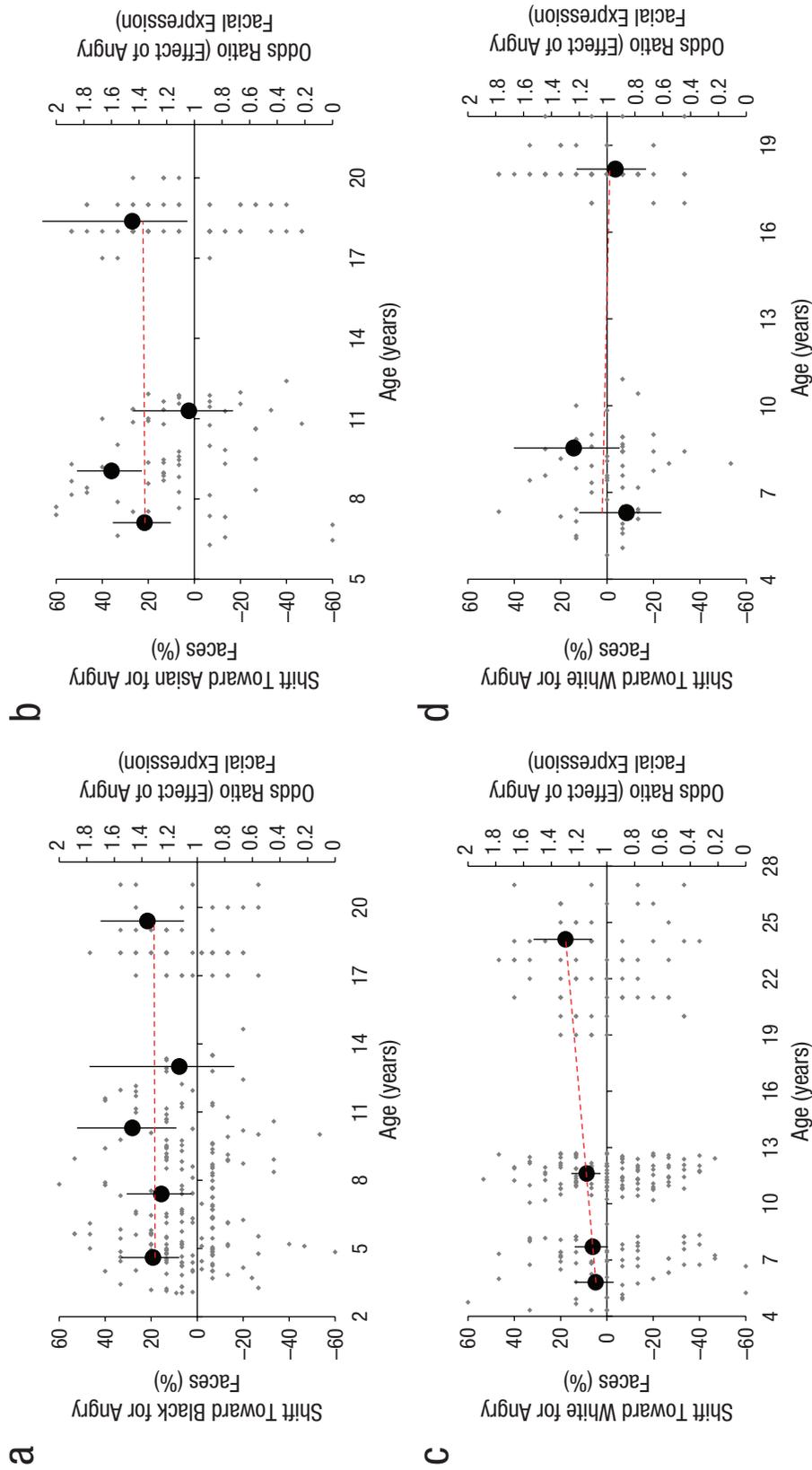


Fig. 2. Percentage shift in categorization of angry faces as belonging to the out-group (raw participant-level data, gray dots; left y-axis) and odds ratios estimating the increased likelihood of categorizing an angry face into the out-group (black circles; right y-axis), as a function of age. Shift in categorization was calculated as the difference between the percentage of angry faces categorized as belonging to the out-group and the percentage of angry faces categorized as belonging to the in-group. Error bars indicate 95% confidence intervals for the odds ratios. For ease of presentation, odds ratios are presented for discrete age bins, but all analyses employed age as a continuous variable. The graph in (a) shows the increased likelihood of White participants categorizing an angry face as Black as opposed to White (Experiment 1). The graph in (b) shows the increased likelihood of White participants categorizing an angry face as Asian as opposed to White (Experiment 2). The graph in (c) shows the increased likelihood of Taiwanese participants categorizing an angry face as White as opposed to Asian (Experiment 3); the data in this graph are from those participants who performed successfully on the pretest categorization measure. The graph in (d) shows the increased likelihood of Black participants categorizing an angry face as White as opposed to Black. In each graph, the dashed line indicates the ordinary least square regression of odds ratio on age.

The observed invariance of intergroup bias is particularly interesting in light of other expected age-related changes in face processing (Taylor, Batty, & Ittner, 2004), most notably, the tendency for older participants to categorize more faces overall as Black: For each additional year of age, participants were 1.15 times more likely to categorize a face as Black as opposed to White, 95% CI = [1.12, 1.18], $\beta = 1.33$, $SE = 0.17$, $p < .001$. This effect can be conceptualized in terms of an increasing tendency to exclude ambiguous faces from the in-group (the *in-group overexclusion effect*; Leyens & Yzerbyt, 1992). However, this tendency was unrelated to the magnitude of bias in our data.

As noted earlier, children generally acquire racial categories around ages 3 and 4 (Aboud, 1988), and indeed, our sample included a number of children who were unable to correctly classify unambiguous faces in the pretest training phase. To more closely link category acquisition to intergroup bias, in a supplementary analysis, we entered the number of successful categorizations at pretest (a proxy for category possession) as an additional predictor in our model and examined the interaction between categorization ability and facial expression. This interaction was significant, $\beta = 0.96$, $SE = 0.38$, $p = .012$; the effect of facial expression was greater in children who could more successfully categorize the faces by race. Indeed, the 44 children who failed to categorize all four unambiguous targets correctly were the only identifiable group in which the “angry = Black” effect was not significant, $\beta = 0.03$, $SE = 0.13$, $p = .79$. In one sense, this result is obvious: Children incapable of categorizing by race are unlikely to systematically discriminate on the basis of race. However, this finding suggests a tight temporal synchrony between the emergence of the ability to categorize by race and the emergence of intergroup bias with respect to race: Categorization ability is predictive of bias, but age is not.

Discussion

In the particular form examined here, preference for the racial in-group emerges in majority children as soon as they acquire intergroup categories, and is not modified by subsequent social experience. Children and adults have markedly different degrees of intergroup experience and abstract knowledge about social groups, including what constitutes “us” and “them”; thus, the invariance observed here is striking. It is also incompatible with accounts of intergroup bias that posit pure-hearted children who gradually internalize society’s ills (e.g., Davey, 1983; Devine, 1989).

But is this result limited to the White-Black racial contrast, rooted as it is in the particular history of those groups in the United States? To investigate this question,

we replicated the experiment using a White-Asian face contrast. In the United States, Asian Americans sit higher on the social hierarchy than Black Americans, and are not stereotypically associated with anger or hostility (D. F. Chang & Demyan, 2007). If our results in Experiment 1 are limited to the White-Black intergroup relationship, or dependent on a learned association between a specific group (Black) and a specific trait (anger), the link between anger and the out-group should be weaker or absent when White Americans categorize ambiguous angry faces as White or Asian.

Experiment 2

Method

Participants. We tested 80 White American children between the ages of 5 and 12 ($M = 9.5$ years, $SD = 1.6$) and 83 adults. Participants were recruited in the same manner as in Experiment 1.

Materials. We created a new set of stimuli designed to be ambiguous between prototypical White and Asian male faces (see Fig. 1). An independent group of 16 adults rated a series of faces with neutral expressions, using a 7-point scale ranging from *obviously Asian* to *obviously White*. We then selected 15 faces rated near the midpoint of the scale (i.e., faces that were statistically distinct from racially unambiguous White and Asian faces). Angry and happy faces were then constructed from these neutral faces to produce our final set of 30 images.

Procedure and analysis. The procedure and analysis were the same as in Experiment 1, except that we included eight trials with unambiguous faces in the pretest training phase. Because our facial images did not differ in mean image luminosity, controlling for that factor was not necessary.

Results and discussion

Results closely replicated the results of Experiment 1: Angry faces were 1.38 times as likely to be categorized as belonging to the Asian out-group as were happy faces, 95% CI = [1.23, 1.55], $\beta = 0.32$, $SE = 0.06$, $p < .001$, and this effect did not differ in magnitude from the effect of facial expression in Experiment 1, $\beta = 0.11$, $SE = 0.074$, $p = .14$. The effect was again constant across the ages tested, as evidenced by a nonsignificant interaction between age and facial expression, $\beta = 0.0016$, $SE = 0.014$, $p = .91$ (see Fig. 2b). Thus, implicit in-group preference emerges early in White American children, is surprisingly invariant across ages, and is a general intergroup effect not constrained to a single social contrast.

Still, the United States has a particular racial history in which all non-White groups have been at least relatively disadvantaged. Therefore, we sought to explore the cross-cultural generality of this developmental invariance of intergroup bias by conducting a third experiment in a society that is far more racially homogeneous than the United States, and for which we could select a target out-group that is not socially disadvantaged. To do so, we turned to Taiwan (Brown, 1996), a racially homogeneous society (Taiwan Government Information Office, 2011) in which children's exposure to racially White individuals occurs largely through portrayals of Whites in toys and Western media (L.-C. Chang & Reifel, 2003); indeed, Taiwanese children appear to be positively predisposed toward Whites in general (Kowalski & Lo, 2001). The same age invariance, if observed, would suggest that it generalizes across a wide range of social and cultural variation.

Experiment 3

Method

Participants. We tested 201 Taiwanese children between the ages of 4 and 12 years ($M = 9.8$ years, $SD = 2.5$) and 80 Taiwanese adults. Participants were recruited from a local university in Taipei, Taiwan, as well as from the university's affiliated preschool and elementary schools.

Materials, procedure, and analysis. The materials, procedure, and analysis were the same as in Experiment 2, except that the instructions were translated into Mandarin. A Taiwanese experimenter tested all participants.

Results and discussion

At first glance, Experiment 3 appeared to reveal a somewhat different pattern of results. Although the effect of facial expression was significant, $\beta = 0.21$, $SE = 0.098$, $p = .032$, this effect was qualified by an interaction with age, which suggested an increase in the strength of bias as a function of age, $\beta = 0.02$, $SE = 0.006$, $p = .002$. However, closer inspection of the data revealed that many younger children were unable to categorize unambiguous faces by race in the pretest trials; indeed, categorization ability and age were highly correlated, $r(280) = .51$, $p < .001$. Given that children who have not yet acquired racial categories should not be expected to show the "angry = out-group" effect, we conducted a follow-up analysis to see whether age continued to predict the strength of bias once pretest categorization ability was entered into the model. It did not; when the number of successful categorizations at pretest was included, the interaction between age and facial expression dropped from significance, $\beta = 0.012$, $SE = 0.007$, $p = .11$, whereas the interaction between

categorization ability and facial expression was significant, $\beta = 0.52$, $SE = 0.23$, $p = .026$. Thus, the emergence of bias was related to the ability to categorize by race. An analysis of the test data that included only those participants who were successful on all categorization trials in the pretest revealed that angry faces were 1.24 times more likely to be categorized as White than Asian faces were, 95% CI = [1.10, 1.41], $\beta = 0.49$, $SE = 0.16$, $p = .003$, an effect similar in magnitude to what we observed in the first two experiments (Fig. 2c).

By showing that the very same stimuli categorized as Asian by White participants were categorized as White by Taiwanese participants, we ruled out the possibility that other stimulus features drove our effects (e.g., the possibility that the angry faces incidentally resembled Asian faces more than White faces). In sum, although the acquisition of the White-Asian racial distinction was delayed in this homogeneous Taiwanese population, we again observed an age-invariant tendency to associate anger with a racial out-group once this delay was accounted for.

Across three experiments spanning two cultures, we observed in-group preference as well as age invariance in the strength of that preference. That is, we found that the youngest members of a social group have attitudes toward a racial out-group that are indistinguishable from those of their adult counterparts, at least among children who have acquired the ability to categorize by race. This pattern is compatible with the idea that in-group preferences are automatic, but a final critical question remained. Our White American and Taiwanese participants belong to majority and high-status groups in their respective cultures. As a result, in-group favoritism and status-based enculturation are directionally consistent in our data and therefore difficult to disentangle. Members of stigmatized cultural minorities, such as Black and Latino Americans, do not consistently show a pattern of in-group favoritism, especially on automatic or implicit measures (Dunham et al., 2007; Newheiser & Olson, 2012; Nosek et al., 2002). We wondered whether members of a disadvantaged group initially show a preference for their own group, which is then drummed out through subsequent learning, or whether intergroup preferences are so closely tuned to prevailing social hierarchies that, even early in development, children from a socially disadvantaged group show the pattern of attitudinal ambivalence characterizing adults in their group. To answer this question, we examined the developmental timing of in-group preference and status-based enculturation in Black Americans.

Experiment 4

Method

Participants. We tested 56 Black American children between the ages of 4 and 10 ($M = 7.6$ years, $SD = 1.3$) and 41 Black adults. Children were recruited from two

predominantly Black elementary schools in the greater Boston area; adults were university undergraduates.

Materials, procedure, and analysis. The materials, procedure, and analysis were the same as in Experiment 1.

Results and discussion

In contrast to the previous three experiments, this experiment showed no overall effect of facial expression on categorization, $OR = 1.00$, 95% CI = [0.84, 1.19], $\beta = 0.001$, $SE = 0.087$, $p = .99$; thus, there was no indication of a bias favoring the in-group. Black Americans did not view angry faces as more or less likely to belong to the racial out-group, compared with the in-group. In addition, there was no interaction between facial expression and age, $\beta = 0.007$, $SE = 0.017$, $p = .69$; the same general pattern characterized children and adults across the full age range (Fig. 2d). Furthermore, although our sample again included children who were still acquiring race categories—as revealed by the correlation between age and pretest categorization ability, $r(96) = .44$, $p < .001$ —categorization ability was unrelated to race bias, $\beta = 0.33$, $SE = 0.27$, $p = .23$.

Thus, from the earliest moments of race consciousness, Black Americans do not show the pattern of in-group preference observed in majority populations. Indeed, a direct comparison between the results of Experiments 1 and 4 revealed that the tendency to associate angry faces with the out-group was present in White but not Black participants, $OR = 1.17$, 95% CI = [1.00, 1.37], $\beta = 0.27$, $SE = 0.10$, $p = .007$. The pattern across these two studies again demonstrates that our results are not due to lower-level stimulus features, which both White and Black participants should have been sensitive to; for example, if the angry faces incidentally resembled Black more than White faces, both White and Black participants should have categorized more angry faces as Black than as White. At a more general level, we again observed developmental invariance: Children's intergroup attitudes do not require a protracted period of environmental tuning, but rather are rapidly fixed at levels commensurate with those of their adult counterparts.

Could the results of Experiment 4 instead stem from Black participants' greater familiarity with the White majority compared with their own racial group? Although familiarity can affect preferences (e.g., Zajonc, 2001), we do not believe it is a sufficient explanation in this case, for two reasons. First, our participants came from majority-Black schools and neighborhoods. Second, recent evidence suggests that when familiarity and status are in opposition, status clearly wins: Black South African children, including those who have had little or no contact with Whites, do not show preference for their racial

in-group at either the explicit or the implicit level (Newheiser, Dunham, Merrill, Hoosain, & Olson, 2012; Shutts, Kinzler, Katz, Tredoux, & Spelke, 2011). Thus, we interpret our results as suggesting that the internalization of the prevailing status hierarchy is an early-emerging psychological imperative no less "basic" than a tendency toward in-group preference.

General Discussion

These data diverge markedly from prior data showing that children's self-reported intergroup bias declines with age (Aboud, 1988; Raabe & Beelmann, 2011). We argue that previous research charted the development toward an explicit, culturally sanctioned egalitarianism that is distinct from the underlying patterns of implicit evaluation observed in our experiments (Dunham et al., 2008). More broadly, we offer several conclusions. First, in-group preference and status-based enculturation are automatic, early-emerging mechanisms of preference formation, appearing concurrently with the child's explicit ability to categorize by race. Second, the fact that these mechanisms do not show appreciable age-related change strongly suggests that, rather than depending on gradual enculturation or social tuning, they represent a form of rapid social orienting, in which children map membership and status onto existing social groups while simultaneously acquiring representations of those groups. Finally, although in-group preference may be a general phenomenon, it is not inevitable; an important boundary condition is revealed by shifting focus to the socially disadvantaged, for whom cues to group-based social status are influential from the earliest moments of social categorization. Although other research has also found a lack of implicit in-group preference in non-White children (Dunham et al., 2007; Newheiser & Olson, 2012), our inclusion of younger children allowed us to extend this finding to the early moments of race-based category knowledge.

As in other investigations of implicit attitudes, we observed widespread variability in the strength of implicit bias at the participant level (as is visible across all four panels of Fig. 2). One source of variability is the general noise inherent in developmental data and implicit measurement. But future work should target other, as yet unobserved, moderators of bias. Plausible candidates include the presence of positive forms of intergroup interaction and diversity (e.g., McGlothlin & Killen, 2010), as well as individual differences in tendencies toward essentializing group boundaries (Rhodes, Leslie, & Tworek, in press).

Views of intergroup attitudes often contrast an automatic tendency toward in-group preference with the gradual internalization of cultural value. The four experiments

reported here suggest that the temporal assumption embedded in that dichotomy is misguided; in-group preference and status sensitivity emerge with equal rapidity early in life, and are equally impervious to subsequent social input. Thus, early emergence and developmental invariance characterize both of these components driving implicit intergroup bias.

We have focused on a simple form of implicit intergroup bias driven by a connection between facial expression and racial categorization. When it comes to richer forms of social knowledge, adults and children clearly differ, and we make no claims about the developmental timing of such knowledge (e.g., culturally consensual stereotypes, which must be socially learned in a different fashion). Nonetheless, a basic system of social evaluation emerges in early childhood and persists unchanging into adulthood.

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

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