Research Article

The Development of Implicit Attitudes

Evidence of Race Evaluations From Ages 6 and 10 and Adulthood

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ABSTRACT—***To understand the origin and development of implicit attitudes, we measured race attitudes in White American 6-year-olds, 10-year-olds, and adults by first developing a child-oriented version of the Implicit Association Test (Child IAT). Remarkably, implicit pro-White/anti-Black bias was evident even in the youngest group, with self-reported attitudes revealing bias in the same direction. In 10-year-olds and adults, the same magnitude of implicit race bias was observed, although self-reported race attitudes became substantially less biased in older children and vanished entirely in adults, who self-reported equally favorable attitudes toward Whites and Blacks. These data are the first to show an asymmetry in the development of implicit and explicit race attitudes, with explicit attitudes becoming more egalitarian and implicit attitudes remaining stable and favoring the in-group across development. We offer a tentative suggestion that mean levels of implicit and explicit attitudes diverge around age 10.***

How early in development are implicit attitudes toward social groups formed? What is the developmental pattern of the relationship between such attitudes and those that are consciously expressed? When does the dissociation between the two observed in adults emerge in young children? In this article, we report the first evidence of the development of implicit and explicit attitudes toward social and nonsocial groups using three age groups. The presence of implicit forms of attitudes in adults has been well demonstrated, as has the ability to use such attitudes to predict a wide range of behaviors, including friendliness toward out-groups, selection for a job, and allocation of resources (see Poehlman, Uhlmann, Greenwald, & Banaji, 2005, for a review). Understanding the development of implicit attitudes in young children is imperative given the important role intergroup attitudes play throughout life. Moreover, investigating the nature of implicit social cognition in children provides an opportunity to understand the social-cognitive mechanisms that are universal and the cultural processes that mark the development of these attitudes and preferences.

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Creating a modified, child-friendly version of the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), first introduced here as the Child IAT, we measured implicit race attitudes in white North American middle-class children. We selected race as the social category because of evidence that North American children achieve an adultlike concept of this category by age 5 (Hirschfeld, 1996, 2001). In a series of studies, Hirschfeld showed that children as young as 4 do not rely on perceptual information alone when categorizing people. Instead, children appear to essentialize racial kinds, regarding race as a property that is fixed at birth and resistant to change across time and surface features, and even believe it to be predictive of nonobvious properties. In other words, children's concept of race may be commensurate with that of adults (cf. Allport, 1954).

In the present study, we investigated whether kindergartners (5- and 6-year-olds) have implicit attitudes toward race categories soon after the age at which they are expected to have achieved a mature representation of the concept of race. Aboud (1988) showed that self-reports at this age reveal evaluative assessments, or attitudes, associated with racial categories. White North American children begin to report negative explicit attitudes toward out-group members as early as age 3; such attitudes begin to decline by age 7, until they disappear around age 12. What is unknown is how the parallel development of automatic (implicit) associations of good and bad attributes with racial categories unfolds. We tracked implicit race attitudes also in 10-year-olds, as well as adults, to view the developmental progression of such attitudes cross-sectionally. Much has been learned about adults' implicit attitudes using the IAT (Banaji, 2001; Greenwald et al., 1998; Lane & Banaji, 2004; Nosek, Banaji, & Greenwald, 2002); therefore, this sample also provided a benchmark for testing the new child version of the IAT.

To allow more confident interpretation of the results, we also included a measure of implicit attitudes toward nonsocial categories (insects and flowers). Because flowers are known to elicit more positive implicit attitudes than insects in most people (Greenwald et al., 1998), if the insect-flower Child IAT revealed the expected attitude effect, a potential null result on the race test among children could be interpreted as a genuine lack of race bias, rather than a failure of the new measure to detect an effect.

METHOD

Participants

The sample consisted of 79 participants (39 males, 40 females): 27 kindergartners (mean age = 6 years 1 month; 14 males, 13 females); 30 fifth graders (mean age = 10 years 2 months; 15 males, 15 females); and 22 adults (mean age = 19 years; 10 males, 12 females). Participants were recruited from a predominantly middle-class European American community. Children were tested in an elementary school in a Boston suburb; adults were tested in a laboratory at Harvard University.

Procedure

The IAT

The IAT measures the relative strength of association between a target concept (e.g., race: African American and European American) and an attribute concept (e.g., evaluation: words with good meanings and words with bad meanings). The IAT is a response latency measure that rests on an assumption it shares with other measures of associative strength—that the more strongly two concepts have come to be associated with one another, the faster and more accurately they can be paired together (see Banaji, 2001, for a comparison with other measures).

In a typical procedure used with adults, participants first practice classifying stimuli in terms of a *target* concept such as race or gender. For example, pictures of Black and White Americans, appearing one at a time in the middle of the screen, are classified using two keys (typically the "E" and "I" keys) on a computer keyboard. Participants press one key in response to all pictures of Black Americans and press the other key in response to all pictures of White Americans. Trials advance only following correct responses, to encourage low error rates.

Participants next practice classifying stimuli in terms of an *attribute* concept that has two categories. For example, if evaluation is the attribute dimension, words with good or bad meaning (e.g., *love*, *joy*, *friend*, *hate*, *vomit*, *bomb*) appear one at a time in the middle of the screen, and participants press one key in response to words with a good meaning and press the other key in response to words with a bad meaning. These single-dimension tasks serve to familiarize participants with the target and attribute dimensions and the stimulus set.

In the next block of trials, the strength of the association between the target concept (e.g., race) and the attribute concept (e.g., evaluation) is measured. These trials require categorizing the four classes of items using two keys, with one target and one attribute category sharing each response key. Participants are presented with a total of 60 trials (20 practice trials, followed by 40 critical trials) in which they view faces of *African Americans* and *European Americans* and *good* and *bad* attribute words in equal numbers (15 trials of each stimulus type). Stimuli are presented one at a time.

In one block of trials, target concept A is paired with attribute concept A (e.g., "When you see a *Black* face or a *good* word, press the 'E' key"), and target concept B is paired with attribute concept B (e.g., "When you see a *White* face or a *bad* word, press the 'I' key").

Then, the target concepts switch location, such that target concept B is paired with attribute A (e.g., *White* face and *good* word), and target concept A is paired with attribute B (e.g., *Black* face and *bad* word). The assumption is that the stronger these associations, the faster and more accurately participants will respond in the second block compared with the first. Readers interested in sampling this task may visit www.implicit.harvard.edu.

A response latency is recorded for each trial by measuring the time from the onset of the stimulus until a response (correct or incorrect) is entered. Each trial advances following a correct response, and there is a 1-s intertrial interval. The order of target-attribute pairings is counterbalanced between subjects so that order of blocks does not interfere with interpretation of the result.

We made several modifications to the standard IAT so that it would be suitable for use with children. The IAT typically uses faces to denote race. We used pictures of Black and White children's faces. Because of the variability in reading level among children, we substituted voice recordings of good and bad words for printed words. Recordings of the attribute words were made by an adult female and were presented auditorally through speakers built into the computer monitor. Thus, participants were instructed to press one button when they heard a good word and to press the other button when they heard a bad word. For the same reason, all instructions were spoken by the experimenter. Response latencies to all stimuli, pictures and auditory stimuli, were recorded, as were errors in classification. Response latencies for the attribute words were recorded after the full words were spoken.

Eight target stimuli were used for each Child IAT. The insect-flower test included four pictures of insects and four pictures of flowers, and the race test included four pictures of European American children and four pictures of African American children. The eight attribute stimuli consisted of four words capturing a good concept (*good*, *nice*, *fun*, *happy*) and four capturing a bad concept (*bad*, *mean*, *yucky*, *mad*); these eight stimuli were used in both Child IATs. We chose words that appear frequently in young children's vocabulary.

Children were introduced to the task as a "computer game" in which they would see pictures and hear words and would have to press a button in response to each. Although all participants were tested individually, the experimenter remained in the room with child participants but not with adults. For the children, motor responses were facilitated by using two large JellyBean® buttons (3-in. diameter) instead of the "E" and "I" computer keys traditionally used with adults. All other aspects of the procedure were identical for adults and children. The insect-flower Child IAT was administered first, followed by the race Child IAT.

Explicit Attitude Measure: Self-Reported Preference

Following the Child IAT, participants viewed a series of paired pictures, presented side-by-side, and provided forced-choice preference judgments. The pairs consisted of same-race children, different-race children (i.e., one White child and one Black child), insects, flowers, and insect-flower pairs (i.e., one insect and one flower). On critical trials, a picture of a Black child and a picture of a White child were paired, and participants indicated whom they preferred. The pictures used in the explicit attitude measure were the same pictures used in the implicit attitude measure. Unlike in the Child IAT, participants were encouraged to take their time and to deliberate over their responses.

RESULTS AND DISCUSSION

We analyzed the implicit attitude measure following standard protocol for the improved scoring algorithm recommended by Greenwald, Nosek, and Banaji (2003). Two participants in the 6-year-old group were unable to complete the race Child IAT; they were included only in analyses of the insect-flower attitude data.

For each subject, an IAT score in the form of a measure termed D, a variant of Cohen's d (see Greenwald et al., 2003), was computed by calculating the difference between the mean response latencies for the two double-categorization blocks within each Child IAT and dividing that difference by its associated pooled standard deviation. Because of a difference in response latency as a function of type of stimulus presentation (pictures vs. spoken words) within each double-categorization block, we calculated separate IAT effects for responses to target stimuli and for responses to attribute stimuli and then averaged them to produce one score for each of the combined blocks. A multivariate analysis of variance (MANOVA) revealed no significant main effects of age or order (White + Good/Black + Bad first or White + Bad/Black + Good first) on the implicit measure of attitude. Additionally, no significant age-by-order interaction was observed (all $ps > .2$).

6-Year-Olds

Insect-Flower Attitudes

Not only were the youngest children in the study able to complete the Child IAT, but an implicit attitude was clearly detected. Six-year-olds were significantly faster to respond to insect + bad/flower + good trials than insect + good/flower + bad trials (mean difference = 109 ms), $D = 0.22$, $SD = 0.40$, $t(26) = 2.86$, $p < .01$. Although boys showed this preference for flowers over insects to a lesser extent than did girls, the gender difference was not statistically significant.

Similarly, 6-year-olds self-reported a clear preference for flowers over insects (77% of the time, participants chose a flower over an insect), $t(23) = 3.24$, $p < .01$. This explicit attitude effect was driven largely by females; females reported such a preference on 96% of the trials, but males preferred flowers on 43% of the trials, $t(22) = 4.02$, $p < .01$. The presence of a gender difference in self-reported attitude, but not in implicit attitude, suggests that by age 6, children's consciously expressed attitudes may be more exaggerated along gender lines than implicit attitudes for the same attitude objects.

Race Attitudes

As Figure 1 shows, the 6-year-olds had already developed implicit pro-White/anti-Black associations, observed in faster responding on White + good/Black + bad trials than Black + good/White + bad trials (mean difference = 79 ms). The average IAT effect was significant, $D = 0.22$, $SD = 0.24$, $t(24) = 4.48$, $p < .001$. These data are the first to reveal the emergence

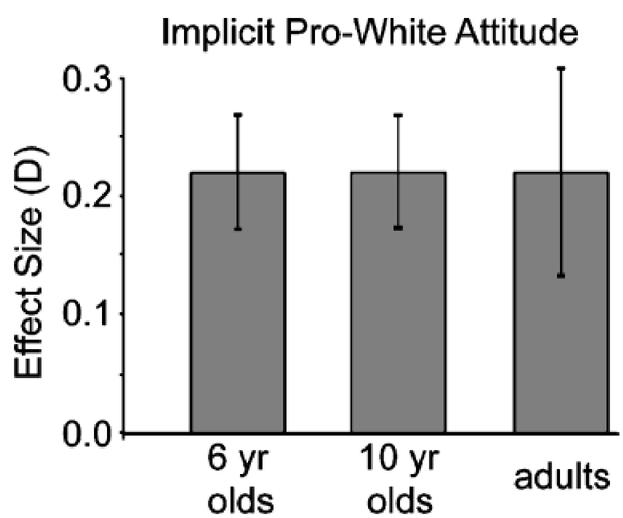

Fig. 1. Implicit race preference in the three age groups. A positive value of D indicates a preference for Whites relative to Blacks.

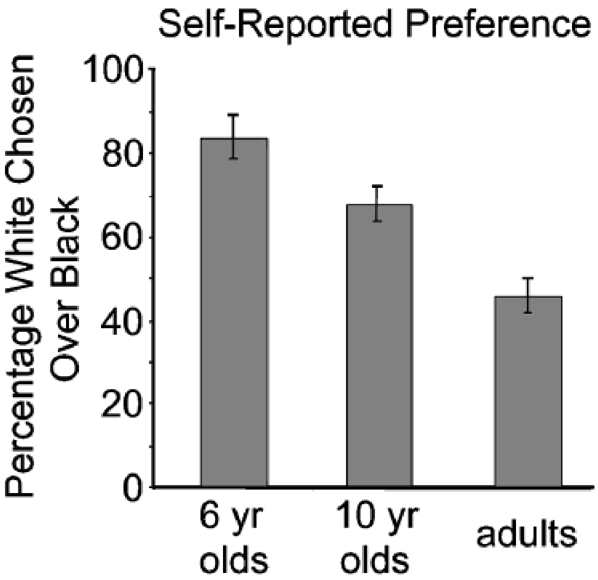

Fig. 2. Explicit race preference in the three age groups.

of implicit attitudes toward social groups in children as young as 6 years of age.

Six-year-olds' explicit race attitudes were consonant with their implicit attitudes. They self-reported a strong preference for photographic images of White compared with Black children (84% of the time, a picture of a White child was selected over that of a Black child), $t(21) = 6.38$, $p < .01$ (see Fig. 2). Both males and females reported a preference for Whites over Blacks, but there was a significant gender difference (93% vs. 70%, respectively), $t(20) = 2.38$, $p = .03$.

10-Year-Olds

Insect-Flower Attitudes

Like 6-year-olds, 10-year-olds were faster to respond to flower + good/insect + bad trials than to insect + good/flower + bad trials (mean difference = 117 ms), $D = 0.30$, $SD = 0.50$, $t(29) = 3.30$, $p < .01$.

Ten-year-olds showed the same pattern of preference on the explicit task as on the Child IAT, choosing flowers over insects 67% of the time, $t(29) = 2.14$, $p = .04$. As with the 6-year-olds, a gender difference in reported preference emerged; females were more likely than males to choose flowers over insects (88% vs. 45%, respectively), $t(28) = 3.19$, $p < .01$.

Race Attitudes

Ten-year-olds were faster to respond on White + good/Black + bad trials than on Black + good/White + bad trials (mean difference = 80 ms), $D = 0.22$, $SD = 0.26$, $t(29) = 4.58$, $p < .001$. Ten-year-olds and 6-year-olds did not differ in mean levels of implicit race attitudes, which suggests that these attitudes remain stable during the elementary-school years.

Similarly, 10-year-olds also revealed an explicit preference for Whites over Blacks (68% of the time, they chose the White child over the Black child), $t(29) = 4.13$, $p < .01$, but this preference was significantly more muted than that reported by 6-year-olds (68% vs. 84%, respectively), $t(50) = 2.27$, $p = .027$. In other words, although 6- and 10-year-olds showed the same magnitude of implicit race bias, by age 10 children's self-reported preference for their own group was significantly reduced (see Figs. 1 and 2).

Adults

Insect-Flower Attitudes

Replicating the result from many studies using the standard IAT, adults were faster to respond to flower + good trials than to insect + good trials on the Child IAT (mean difference = 138 ms), $D = 0.49$, $SD = 0.46$, $t(21) = 4.98$, $p < .001$. Similarly, adults self-reported a strong preference for flowers over insects (86% of the time, participants chose insects over flowers), $t(21) = 5.43$, $p < .01$, with no gender difference observed.

Race Attitudes

Adults showed the same implicit pro-White/anti-Black response bias on the race Child IAT as child participants did (mean difference = 89 ms), $D = 0.22$, $SD = 0.41$, $t(21) = 2.50$, $p = .021$. However, adults self-reported an equal preference for White and Black targets (46% of the time, participants chose the White child over the Black child), $t(21) = -0.672$, $p = .51$ (see Figs. 1 and 2).

GENERAL DISCUSSION

Taken together, these data show the early emergence of implicit attitudes toward both nonsocial (flower vs. insect) and social (Black vs. White) categories. By age 6, children appear to have formed detectable implicit attitudes toward social groups. Moreover, these attitudes did not vary across the three age groups studied here. Yet for self-reported race attitudes, a quite distinct pattern emerges. An early and strong preference for members of one's own social group subsides by age 10 and levels off to an equal preference for the in-group and out-group by adulthood.

That this dissociation between implicit and explicit attitudes was not observed at an earlier age raises the question of whether or not such implicit-explicit dissociations are even possible in younger children, whose conscious and less conscious attitudes may be more unified in valence than is the case for older children and adults. Note, however, that on the insect-flower test, 6-year-old boys implicitly preferred insects to flowers, but explicitly showed no preference. That such a dissociation was observed suggests that implicit and explicit attitudes need not be congruent at this young age.

What is one to make of these first findings on the development of race attitudes, and especially the dissociation between patterns of implicit and explicit attitudes across age? Should the data be interpreted as revealing general implicit in-group preference (i.e., any group of children tested would show an effect favoring their own group) or an effect that is peculiar to a dominant group's implicit preference, and therefore not likely to be mimicked by members of minority groups? Although this issue cannot be definitively resolved here, we do offer a few observations from previous research on adults and children. First, substantial data on adult Black Americans ($n > 5{,}000$) indicate that, on average, they lack an implicit in-group preference, instead showing no bias in favor of one or the other racial group, even though they report strong in-group liking on self-report measures (Nosek et al., 2002). Second, Baron, Shusterman, Bordeaux, and Banaji (2004) measured race attitudes in 12- to 14-year-old Black Americans who lived and attended school in Bronx, New York, and replicated the pattern found for Black adults. In other words, at least by age 13, young Black Americans do not show the in-group preference that has come to be the hallmark of White Americans, close to 80% of whom show some degree of in-group preference on the IAT.

To date, we have interpreted the relative lack of in-group bias in adult Black Americans as revealing a culturally driven modulation of the default in-group bias. Group membership pushes in the direction of in-group positivity, but that positivity is modulated by the countervailing force of the evaluation of the group in the eyes of the broader culture. That evaluation then "becomes" the implicit attitude of group members. The best next step for research on this issue would be to test a sample of Black American children, matched to the present sample in age, but coming from a predominantly Black community. If Black 6-year-olds reveal the same pattern as the White 6-year-olds in this study, showing strong preference for their own group, this would provide support for the idea that in-group bias is the default, with shifts even by age 10 reflecting an internalization of the attitudes of the larger culture. However, if the obtained result reveals that Black 6-year-olds show an effect that resembles that of adolescent and adult Black Americans (i.e., no preference for the in-group over the out-group), this would suggest that by age 6, the typical in-group preference is modulated by knowledge of the group's standing in the more broadly based sociocultural hierarchy. Dunham, Baron, and Banaji (2004) reported that Hispanic children as young as 5 show an in-group preference for Hispanic over Black, but show no preference for Hispanic over White, which suggests that implicit intergroup attitudes are learned quite early, and that children who come from disadvantaged groups experience the lower attitudinal status of their own group.

In a recent article, Olsson, Ebert, Banaji, and Phelps (2005) reported that both Black and White adult Americans show quicker extinction to fear conditioning involving own-race faces than to fear conditioning involving other-race faces. Olsson et al. took this finding as indicating that group membership plays a robust role in attitudes, at least those that involve classical conditioning as the learning mechanism. The factor that mediated the slower extinction to out-group fear was romantic contact—participants who had had romantic relationships with out-group members were less likely than others to show this persistence of fear learning toward out-group members. Analyses of the tenacity and plasticity of intergroup attitudes across the life span will be crucial in building a proper understanding of the origins of prejudice.

What about the role of familiarity in producing the obtained effects? There is little doubt that familiarity plays a role in attitude development—what is familiar is more liked than what is unfamiliar (Cutting, 2003; Zajonc, 1968), and what is liked becomes more familiar because preference presumably leads to greater seeking of contact. However, Dasgupta, McGhee, Greenwald, and Banaji (2000; also see Dasgupta, Greenwald, & Banaji, 2003) ruled out familiarity as the dominant explanation of IAT effects by showing (a) preference for low-familiarity but positive stimuli over high-familiarity but negative stimuli and (b) preference effects that remain even after statistically controlling for familiarity effects item by item. However, in young children, it is quite possible that attitudes, both implicit and explicit, may indeed rely more on familiarity than on preference, and future tests of this possibility will be important. It will be relatively easy to create studies in which children are familiarized with otherwise novel social groups, so that it will be possible to observe potential changes in implicit attitudes that are uncontaminated by existing knowledge of who is good and less good (Baron, Dunham, & Banaji, 2005). Likewise, field studies in schools with broad diversity in ethnicity, class, culture, and nationality will also provide useful data.

The present data demonstrate that implicit attitudes can be measured in children using the Child IAT. There is no doubt that this measure will continue to be improved in subsequent studies, in particular, to make it available for use with younger samples. The basic procedure as described here is available for download by investigators interested in understanding a host of implicit attitudes in young children. The most recent procedures and data-analytic suggestions may be found at www.people.fas.harvard.edu/~banaji.

In conclusion, the evidence from this and related studies completed in our laboratory suggests that implicit race attitudes are acquired early and remain relatively stable across development, even though explicit attitudes become more egalitarian. It is around age 10 that the split between mean levels of conscious and less conscious race attitudes first emerges, pointing out the differential sensitivity of these two forms of attitude to the societal demand to be unbiased in race-based evaluation.

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