Examining Children's Implicit Racial Attitudes Using Exemplar and Category-Based Measures

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The goal of this research was to examine children's implicit racial attitudes. Across three studies, a total of 359 White 5- to 12-year-olds completed child-friendly exemplar (Affective Priming Task; Affect Misattribution Procedure) and category-based (Implicit Association Test) implicit measures of racial attitudes. Younger children (5- to 8-year-olds) showed automatic ingroup positivity toward White child exemplars, whereas older children (9- to 12-year-olds) did not. Children also showed no evidence of automatic negativity toward Black exemplars, despite demonstrating consistent pro-White versus Black bias on the category-based measure. Together, the results suggest that (a) implicit ingroup and outgroup attitudes can follow distinct developmental trajectories, and (b) the spontaneous activation of implicit intergroup attitudes can depend on the salience of race.

In the past two decades, advances in the study of implicit social cognition have provided new insight into adults' racial attitudes. One important finding to emerge from this literature is that although White adults often express egalitarian beliefs on self-report measures, they typically show racial bias on implicit measures (Nosek, Hawkins, & Frazier, 2011; Olson & Fazio, 2003). For example, being primed with prototypically Black faces or racially stereotypical words can evoke negative attitudes and associations among White adults, even when they are unaware of the prime or are motivated not to express racial prejudice (e.g., Devine, 1989; Fazio, Jackson, Dunton, & Williams, 1995; Livingston & Brewer, 2002; Payne, Cheng, Govorun, & Stewart, 2005). Research has confirmed that these automatically activated race-based associations can have negative consequences for minority group members (Eberhardt, Goff, Purdie, & Davies, 2004; Govorun & Payne, 2006; Payne, 2001). In addition, recent meta-analyses suggest that adults' implicit racial attitudes predict

behavior above and beyond explicit attitudes (Cameron, Brown-Iannuzzi, & Payne, 2012; Greenwald, Poehlman, Uhlmann, & Banaji, 2009; cf., Oswald, Mitchell, Blanton, Jaccard, & Tetlock, 2013), particularly when more subtle nonverbal behaviors during interracial interactions are assessed (Greenwald et al., 2009).

One question to emerge from this literature is whether children similarly show racial bias on implicit measures. Research suggests that White majority children express racial preferences quite early in development (Aboud, 2008; Nesdale, 2007; Raabe & Beelmann, 2011). When asked, 3- and 4-year-old White children typically express a pro-White bias that continues throughout early childhood and declines sharply around 9 years of age (Raabe & Beelmann, 2011). Additional research suggests that implicit intergroup preferences can emerge by at least 6 years of age (Baron & Banaji, 2006; Dunham, Baron, & Banaji, 2008; Rutland, Cameron, Milne, & McGeorge, 2005), with both younger and older White children showing adult-like levels of intergroup bias favoring their racial ingroup in comparison to racial outgroups (e.g., Black) on child-friendly versions of the most common implicit measure of racial attitudes, the implicit association test (IAT; Greenwald, Nosek, & Banaji, 2003).

The goal of the present research was to increase our understanding of implicit racial attitudes in childhood by examining whether White children show implicit racial biases toward racial exemplars (i.e., a White child vs. a Black child) that mirror their implicit intergroup attitudes toward racial categories (i.e., White vs. Black). Research with adults suggests that the automatic evaluation of racial exemplars can differ depending on whether the exemplars are being intentionally categorized by race (Olson & Fazio, 2003). However, to date, studies examining children's implicit racial attitudes have relied almost exclusively on measures that ask children to categorize targets by race. As such, we do not know whether and when racial exemplars will activate race-based attitudes for children. To address these questions, across three studies we examined whether White children show racial preferences using exemplar-based priming measures of implicit attitudes.

Implicit Attitudes

Implicit attitudes have been defined as "unintentional, resource-independent, unconscious, or uncontrollable" (Gawronski & De Houwer, 2014, p. 284) evaluations that are spontaneously activated by the presence of an attitude object. As compared to self-reports, implicit measures are meant to assess attitudes that people may be unable or unwilling to disclose (Greenwald et al., 2003). In studies with adults and children, implicit racial attitudes have most frequently been assessed using the IAT (see Nosek et al., 2011, for a review), a reaction-time measure that estimates relative evaluations of two racial groups (e.g., White vs. Black). In order to successfully complete this measure, participants must intentionally categorize targets by race. The findings from a growing number of studies with young children provide robust evidence that implicit intergroup biases are present from early childhood (see Dunham et al., 2008 for a review) and remain stable across development (Dunham, Chen, & Banaji, 2013; Dunham et al., 2008; cf.,

Baron, 2015). When categorizing targets by race, White British children aged 6–16 years (Rutland et al., 2005), as well as White American 6- and 10-year-olds (Baron & Banaji, 2006; see Raabe & Beelmann, 2011, for a review), demonstrate a consistent implicit intergroup preference for White relative to Black racial groups at a magnitude comparable to that found with adults.

These initial findings have provided valuable information about children's implicit attitudes when they are intentionally categorizing others by race. However, based on the research to date, we do not know whether similar racial biases would emerge in response to racial exemplars when children are not asked to categorize them by race, and whether this might differ across development. As we outline in Figure 1, in order for race-based associations to be activated and applied in response to a racial exemplar, the exemplar must first be categorized primarily by race. There is extensive research to suggest, however, that for adults, racial categorization is not inevitable. For example, targets were not spontaneously categorized by race when adults were cognitively busy (Gilbert & Hixon, 1991), or when contextual cues or personal motivations encouraged adults to categorize targets by a competing identity (Macrae, Bodenhausen, & Milne, 1995; Mitchell, Nosek, & Banaji, 2003; Sinclair & Kunda, 1999; Steele, George, Cease, Fabri, & Schlosser, 2018). In addition, both theory and research suggest that while children can categorize others by race when asked to do so, they may not consistently use race as a psychologically meaningful basis for grouping others (Pauker, Williams, & Steele, 2016, 2017). For example, when presented with a picture of Barack Obama, children may spontaneously categorize him by profession ("he was the president") and not by his race (see Lipman, Steele, & Williams, 2013; Mitchell et al., 2003; Steele et al., 2018).

Once categorized primarily by race, race-based attitudes can only be activated and applied if a child has acquired a sufficiently consistent positive or negative attitude toward members of that racial
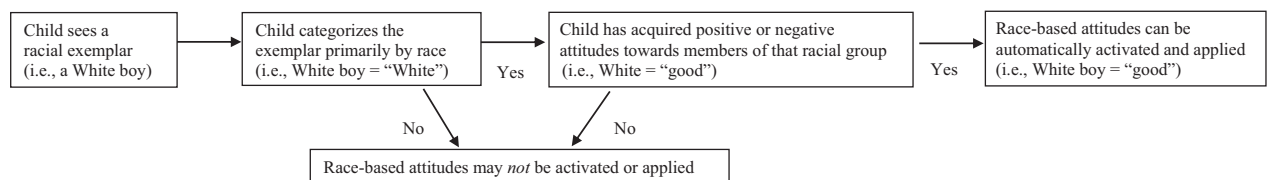

Figure 1. This model outlines the conditions under which a child may (or may not) activate and apply race-based attitudes in response to a racial exemplar.

group (Figure 1). However, based on research to date, it is not clear whether the implicit pro-White (vs. Black) intergroup biases typically displayed by White children reflect attitudes toward only one racial group (i.e., positivity toward the White racial ingroup or negativity toward the Black racial outgroup) or attitudes toward both. If we wish to develop interventions aimed at improving intergroup attitudes, it will be important to understand whether consistent attitudes are spontaneously activated in response to both ingroup and outgroup racial exemplars, and whether this differs across development.

Prejudice Development

Building on current theories of prejudice development, there are a number of reasons to suspect that, for younger children, racial ingroup exemplars (e.g., a White child) should spontaneously elicit positivity, even when White children are not asked to categorize targets by race. Several prominent social developmental theories of prejudice suggest that early childhood is a pivotal period for the initial acquisition of racial stereotypes and preferences (Aboud, 1988; Bigler & Liben, 2007; Nesdale, 2007). Until at least 8 years of age, children focus primarily on themselves and their ingroups, holding the egocentric and then sociocentric view that they are, and should objectively be, viewed more positively than others (Aboud, 1988, 2008). Early childhood is also marked by age-specific processing styles that impact interpersonal judgments and evaluations. Between 4 and 7 years of age, perceptual processes dominate, with children focusing on visual cues such as race to categorize and evaluate the self and others (Aboud, 2008). Although social cognitive theories of prejudice development have not focused on the automatic activation of racial attitudes per se, both theory and research suggest that children should show implicit favoritism toward racial ingroup members in early childhood, even when they are not asked to categorize others by race (Cameron, Alvarez, Ruble, & Fuligni, 2001).

It is less clear, however, whether older children would similarly activate positivity in response to a racial ingroup member. Given that we expect younger White children to spontaneously show implicit racial preferences favoring White exemplars, and that older White children consistently show an implicit pro-White (vs. Black) intergroup bias when required to categorize others by race, one possibility is that older children would also activate and apply positivity in response to novel racial ingroup exemplars. However, there are also a number of reasons why we might not expect older children to show implicit bias favoring racial ingroup members on exemplar measures. Social cognitive developmental theories of prejudice suggest that in late childhood, after 8 years of age, cognitive processes begin to dominate over perceptual processes (Aboud, 2008). Around this same time, White children begin to express less racial prejudice as they gain a better appreciation of the differences among members of a common group and internalize social norms that discourage racism (Aboud, 2008; Rutland et al., 2005). It seems possible, therefore, that positivity in response to racial ingroup members might not be automatically activated by racial exemplars in late childhood, except in contexts where race is a salient and functionally useful dimension along which to categorize others (Pauker et al., 2016; see also Bigler & Liben, 2007).

One additional question is whether racial outgroup members, such as Black exemplars, spontaneously activate negativity among White children. We suggest that in order for a racial exemplar (e.g., a Black child) to activate race-based attitudes, the exemplar must not only be categorized by race (e.g., "Black"), but affect toward members of that racial group (i.e., Black = "bad") must be sufficiently acquired to be activated (Figure 1). However, recent theories of implicit intergroup cognition suggest that implicit attitudes reflect "a rapidly forming ingroup-favoring tendency" (Dunham et al., 2008, p. 248), suggesting that intergroup biases in childhood may reflect an automatic positivity toward the ingroup, and not necessarily a corresponding automatic negativity toward outgroups. Consistent with this possibility, some theories of prejudice development (e.g., Nesdale, 2007) suggest that explicit ethnic attitudes in childhood arise as a result of ingroup preference, and not from a dislike of outgroups; it is only as children move toward adolescence that they may shift from ingroup preference to outgroup prejudice. Taken together, these theories suggest that exemplars from racial outgroups might *not* spontaneously activate negativity in childhood.

To date, only a single published research paper has examined children's implicit racial attitudes using priming measures, and the results are consistent with these possibilities. Degner and Wentura (2010) asked children aged 9–14 years to complete affective priming tasks (APT) which presented supraliminal or subliminal primes of German/Dutch (ingroup) and Turkish/Moroccan (outgroup) men. Across four studies there was little evidence

of implicit intergroup bias in late childhood (9–11 years) when the racial group of the targets was not explicitly made salient to the participants. However, when racial categories were made salient and task-relevant, older children demonstrated implicit intergroup bias that mirrored the pattern of results found with the IAT (Degner & Wentura, 2010; see also Livingston & Brewer, 2002; Olson & Fazio, 2003). Although Degner and Wentura (2010) did not examine the racial attitudes of younger children, their findings suggest that older children may only spontaneously activate intergroup racial biases when the task requires that they categorize others by race.

Overview

In the present research, we examined whether White children show implicit racial biases in response to White and Black racial exemplars. We examined this question by administering exemplar-based priming measures to children. Although used less frequently than the IAT (Nosek et al., 2011), priming measures such as the APT (Degner & Wentura, 2010; Fazio et al., 1995; Livingston & Brewer, 2002; Olson & Fazio, 2003) and the affect misattribution procedure (AMP; Payne et al., 2005) have been previously used to assess implicit racial bias among adults. In these measures, participants are presented with multiple trials in which a stimulus prime (e.g., a picture of a Black or White child) is followed quickly by a target image (e.g., a valenced picture in the APT or a neutral inkblot in the AMP) that participants categorize as pleasant or unpleasant. The underlying premise is that affect elicited by the prime is transferred to the target. In the APT, this takes the form of response facilitation or interference (Wentura & Degner, 2010), whereas in the AMP, this is due to affect misattribution (Payne et al., 2005).

In priming measures, participants can spontaneously categorize primes by race; however, they are not explicitly required to do so. As such, primes are processed as individuals and not necessarily as members of a racial group (Degner & Wentura, 2010; Livingston & Brewer, 2002; Olson & Fazio, 2003), allowing us to determine whether racial exemplars spontaneously activate racial attitudes. In addition, racial targets are not presented in a comparative manner and responses to one target category (e.g., the racial category White) are not made relative to another (e.g., the racial category Black). Thus, priming measures provide the

opportunity for attitudinal components (i.e., positivity activated by White faces, negativity activated by Black faces) to be decomposed (Degner & Wentura, 2010; Gawronski & De Houwer, 2014).

Across three studies we examined the implicit racial attitudes of younger (5- to 8-year-olds) and older (9- to 12-year-olds) White children in the large metropolitan city of Toronto. Our primary goal was to examine whether children show spontaneously activated affect in response to racial exemplars that mirror their implicit intergroup attitudes toward racial categories. To assess children's attitudes, we created child-friendly versions of priming measures that have been used with adults, including the APT (Study 1) and AMP (Studies 2 and 3).

Consistent with theory and research examining prejudice development (Aboud, 2008; Cameron et al., 2001; Dunham et al., 2008; Raabe & Beelmann, 2011), we hypothesized that in early childhood (5–8 years) when perceptual processing and sociocentrism dominate (Aboud, 2008), children would show implicit ingroup favoritism. Such a finding would suggest that, even when young children are not asked to categorize others by race, racial ingroup exemplars spontaneously activate positivity when presented as primes. Replicating previous research with 6-year-olds (Baron & Banaji, 2006; Rutland et al., 2005), we also expected younger children to display intergroup bias on an implicit measure that required racial categorization.

We also tested the possibility that, consistent with the findings of Degner and Wentura (2010), racial preferences would not be activated on priming measures in late childhood (9–12 years). We made this prediction based on children's decreased reliance on perceptual distinctions, such as race, as a spontaneous basis for social categorization and judgment at this age (Aboud, 2008; Degner & Wentura, 2010; Pauker et al., 2016, 2017). We expected, however, that when older children were required to construe targets as members of their racial categories, as is the case on the IAT, implicit intergroup bias would be found.

Across each of the studies, we focused on the implicit racial attitudes of White majority children in response to White ingroup members and Black outgroup members. We selected Black children (Studies 1 and 2) and adults (Study 3) as the racial outgroup because research examining the racial attitudes of adults in North America has found that bias is often directed toward members of this racial group (e.g., Devine, 1989; Kawakami, Dunn, Karmali, & Dovidio, 2014; Payne et al., 2005). We reasoned that if negative attitudes toward racial

outgroup exemplars are spontaneously activated for White majority children, these biases would be particularly likely to emerge in response to targets from this racial outgroup. Consistent with the possibility that outgroup negativity becomes acquired more gradually over time (Degner & Wentura, 2010; Nesdale, 2007), we expected to find no evidence that Black racial primes would elicit negative evaluations in either early or late childhood.

Study 1

The main goal of Study 1 was to determine whether younger (aged 6–7 years) and older (aged 9–10 years) White children show evidence of implicit racial biases in response to racial exemplars. If the intergroup attitudes that are acquired in early childhood largely reflect ingroup favoritism (Aboud, 2008; Dunham et al., 2008), we would expect young children to show implicit positivity in response to White primes, even when they are not being asked to categorize primes by race. By contrast, we would expect that for older children, who may be less likely to spontaneously construe others by their racial group membership, these implicit biases would only emerge when the task requires that they categorize primes by race. In addition, we expected outgroup negativity to become automatic later in development (Degner & Wentura, 2010; Dunham et al., 2008; Nesdale, 2007), and therefore, we did not anticipate that younger and older children would demonstrate implicit negativity in response to Black exemplars.

Method

Participants

Ninety-eight White children were recruited from and tested in public schools located in the Greater Toronto Area. Data were collected from April to June 2008. Seven children were unable to complete the study because of comprehension issues ($n = 2$), technical issues ($n = 2$), or experimenter error ($n = 3$), leaving a final sample of 91 participants. This included 37 younger children who ranged in age from 6 years, 4 months to 7 years, 4 months (20 boys, 17 girls; median age = 6 years, 9 months) and 54 older children who ranged in age from 9 years, 5 months to 10 years, 5 months (31 boys, 23 girls; median age = 9 years, 11 months). Participants were recruited from communities with mean annual household incomes ranging from $66,000 to

$102,000 and with an average of 21% of area residents holding at least one university degree. Parental permission and children's verbal assent were obtained prior to the study and each child received a certificate and a small token of appreciation (i.e., a pencil) after participating.

Measures

Child-friendly APT. In the priming task, we made use of neutral primes, race primes, and valenced target images. The neutral primes included color photographs of four tables and four chairs. The race primes included color photographs of eight White and eight Black boys that were matched for attractiveness and emotional expression, and were cropped at the mouth (Greenwald et al., 2003; see Data S1 for information on stimuli). Valenced target images consisted of 16 simple line drawings, 8 of which were positively valenced (i.e., smiling face) and 8 of which were negatively valenced (i.e., frowning face; Rutland et al., 2005).

Child-friendly IAT. The child-friendly IAT (Child IAT) was modeled after the adult version (Greenwald et al., 2003) with the exception that it consisted entirely of pictorial stimuli (Rutland et al., 2005; Williams, Steele, & Lipman, 2016). The target concept of race was represented by previously unseen color photographs of four Black and four White boys matched for attractiveness and emotional expression. The attribute dimension was represented by previously unseen line drawings of four happy and four sad cartoon faces (Rutland et al., 2005).

Procedure

Children were individually tested by one of two trained experimenters on a laptop computer in a quiet location within the school. During testing, the experimenter read the instructions to the children and remained present during the entire testing session to help keep children on-task. Children first completed the child-friendly APT (Child APT) which consisted of three phases.

In Phase 1 of the Child APT, participants were presented with the positively and negatively valenced target images one at a time in random order. Following a fixation of 350 ms, each image was individually presented in the middle of the screen with an inter-trial interval of 1,500 ms (Fazio et al., 1995). Children were asked to quickly sort them using two computer keys. For incorrect responses, feedback (a blue X) remained on the

screen until the correct response was made. A header that contained a happy line drawing on one side of the screen and sad line drawing on the other reminded children of their response options.

In Phase 2 of the Child APT, children were familiarized with photographs of boys and furniture. Each trial began with a fixation cross presented in the center of the screen for 350 ms, followed by an image (either a photograph of a boy or of a piece of furniture) that remained visible until it was categorized using one of three computer keys (see Data S1 for details). Each trial was separated by a blank screen (inter-trial interval of 1,000 ms). To ensure that the pictures were attended to, participants were repeatedly prompted by the experimenter to look at the photographs with the ostensible justification being that they would have to recall them later. In reality, there was no later memory test (Fazio et al., 1995). Each photograph was presented twice and feedback was provided for incorrect categorizations. A header remained on-screen to remind children of their response options.

After a brief pause, participants completed the critical priming trials (Phase 3). All of the stimuli used in this phase had been previously presented in Phase 1 or 2. In each trial in Phase 3, participants saw a prime (315 ms), a blank screen (135 ms), and a valenced target image which remained on-screen until it was categorized as either pleasant or unpleasant (Fazio et al., 1995). In the practice ($n = 8$) and filler trials ($n = 48$), primes consisted of a photograph of a table or chair, followed by a randomly selected valenced line drawing seen in Phase 1. In the critical trials ($n = 64$), primes consisted of a photograph of a White or Black boy, followed by one of four critical targets (two positively and two negatively valenced images) selected a priori from Phase 1 (Fazio et al., 1995; see also Degner & Wentura, 2010). Each race prime was followed by each critical valenced target image exactly once. A header remained on screen to remind children of their response options and feedback was provided for incorrect categorizations. Internal consistency was estimated as outlined by Cunningham, Preacher, and Banaji (2001). For our sample, $\alpha = .23$, replicating the typically low reliability of comparable priming measures completed by children and adults (e.g., Bosson, Swann, & Pennebaker, 2000; Cunningham et al., 2001; Degner & Wentura, 2010).

Children then completed the Child IAT, which consisted of seven blocks (Greenwald et al., 2003). In Block 1 (20 trials), participants categorized

pictures of Black and White boys by race using two computer keys. A header that presented a cartoon image of a Black child and a White child remained on screen to remind children of their response options. In Block 2 (20 trials), line drawings of happy and sad faces were sorted using the same two computer keys and a header that presented a happy and sad line drawing face remained on the screen. Blocks 3 (20 trials) and 4 (40 trials), contained the first set of critical trials. Participants categorized photographs representing one racial group (e.g., Black) and one attribute (e.g., positive) using one computer key and the other racial group and attribute (e.g., White and negative) using the other computer key. Block 5 was similar to Block 1; however, the racial groups associated with the computer keys were reversed. Blocks 6 (20 trials) and 7 (40 trials) contained the second set of critical trials. Participants categorized the racial group and attribute images using the retrained key associations (e.g., White and positive shared one key and Black and negative shared the other). In each block, images were randomly presented, a header remained at the top of the screen to remind children of their response options, and incorrect responses elicited a blue "X" that appeared until the correct response was made. The order of the critical blocks and keys associated with the critical pairings were counterbalanced between participants. For our sample, $\alpha = .78$, which is comparable to what has been found previously with children and adults (Williams & Steele, 2016). The implicit measures were completed in this order to prevent carryover effects of racial categorization (Degner & Wentura, 2010; Olson & Fazio, 2003).

Results and Discussion

Child APT

Data were trimmed to ensure that only valid responses were included in the analyses (see Degner & Wentura, 2010 for similar outlier criteria); incorrect responses were removed (6.1% of total responses), as were reaction times less than or greater than 2 SDs from the mean latency for each participant (4.5%). Mean latencies to the priming trials provided four *Prime-Target Valence* scores for each participant (i.e., White-Positive, White-Negative, Black-Positive, and Black-Negative).

A 2 (race of prime: White vs. Black) × 2 (valence of target: positive vs. negative) × 2 (age of participant: younger vs. older) mixed analysis of variance (ANOVA) was conducted, with the first two factors

within-subjects. A significant main effect of valence of target emerged, $F(1, 89) = 9.20$, $p = .003$, $d = 0.31$, as did a main effect of age, $F(1, 89) = 87.34$, $p < .001$, $d = 1.99$, and an interaction between race of prime and valence of target, $F(1, 89) = 11.06$, $p = .001$, $\eta_p^2 = .11$. These main effects and interaction were qualified by the three-way interaction between race of prime, valence of target, and age of participant, $F(1, 89) = 8.30$, $p = .005$, $\eta_p^2 = .09$.

To decompose this interaction, 2 (race of prime: White vs. Black) × 2 (valence of target: positive vs. negative) within-subjects analyses of variance were conducted separately for younger and older children. For younger children, the two-way interaction between race of prime and valence of target emerged, $F(1, 36) = 8.19$, $p = .007$, $\eta_p^2 = .19$. Although these indices must be interpreted with caution due to the potential for main effects of target valence to distort the results (see Degner & Wentura, 2010), follow-up paired-samples t tests suggest that this interaction was driven largely by ingroup positivity. Following White primes, younger children were faster to respond to positive targets ($M = 1,081$ ms, $SD = 262$) as compared with negative targets ($M = 1,180$ ms, $SD = 326$), $t(36) = 4.27$, $p < .001$, $d = 0.70$. As expected, younger children showed no outgroup negativity. Following Black primes, responses were no faster for negative targets ($M = 1,141$ ms, $SD = 291$) as compared with positive targets ($M = 1,159$ ms, $SD = 318$), $t(36) = -0.48$, $p = .63$, $d = 0.08$, see Figure 2.

Older children only demonstrated a main effect for valence of target, $F(1, 53) = 8.51$, $p = .005$, $d = 0.40$; they were faster to respond to positive targets ($M = 1,120$ ms, $SD = 273$) as compared to

negative targets ($M = 1,161$ ms, $SD = 301$), regardless of the race of the preceding prime. The two-way interaction between prime and valence was not significant, $F(1, 53) = 0.36$, $p = .55$, $\eta_p^2 = .007$. As can be seen in Figure 2, there was no evidence of ingroup positivity or outgroup negativity among older children.

Child IAT

D scores were created as outlined by Greenwald et al. (2003), such that higher scores indicated stronger implicit preference for the racial category White over Black. An independent-samples t-test comparing D scores by age revealed no difference in intergroup bias for younger or older children, $t(89) = 1.18$, $p = .24$, $d = 0.25$. Consistent with previous research (Baron & Banaji, 2006), one-sample t tests comparing the D scores to 0 revealed that both younger ($D = .23$, $SD = 0.40$), $t(36) = 3.55$, $p = .001$, $d = 0.58$, and older ($D = .15$, $SD = 0.27$), $t(53) = 4.00$, $p < .001$, $d = 0.54$, children displayed implicit intergroup bias favoring the White racial category.

In Study 1, we examined White children's implicit attitudes following racial exemplar primes. As expected, a priming effect emerged for younger, but not older, children in the form of ingroup positivity. In addition, neither younger nor older children showed evidence of outgroup negativity on this priming measure. Consistent with previous findings (Baron & Banaji, 2006; Rutland et al., 2005), children's category-based bias on the Child IAT did not differ by age; both younger and older children showed preference for White over Black target faces when they were categorized by race. These findings provide some initial support for the possibility that older children do not rapidly and spontaneously activate and apply consistent affective responses to racial ingroup exemplars, unless racial categorization is made task-relevant, as in the Child IAT (see also Degner & Wentura, 2010, Studies 3 and 4).

Figure 2. Mean raw response time (ms) to valenced targets (positive, negative) by prime type (White, Black) and age group (younger, older children) in Study 1. Smaller scores indicate facilitated (faster) responding. Error bars represent standard error. **$p < .001$.

Study 2

To further examine children's implicit attitudes toward racial exemplars, we sought to replicate and extend the findings from Study 1 by administering a different priming measure, the AMP (Payne et al., 2005), in Study 2. The AMP is ideal for use with children because it requires a limited number of trials and does not rely on response latencies that can
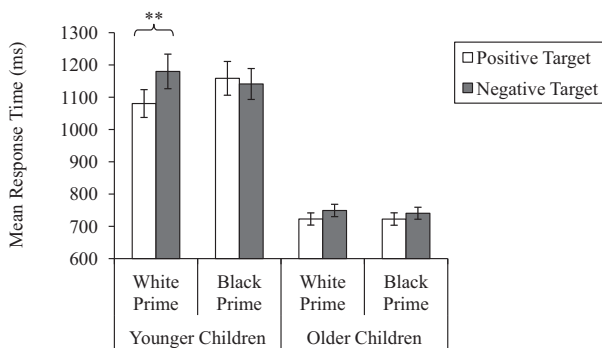
be influenced by temporary distractions (Williams et al., 2016). Despite the reduced number of trials, the AMP demonstrates strong internal consistency and large effect sizes when administered to adults (e.g., Gawronski & De Houwer, 2014; Payne et al., 2005). Importantly, as with the APT, primes are not categorized by race and are not presented in comparison to one another, allowing us to estimate distinct ingroup and outgroup evaluations.

Consistent with the adult version of this measure (Payne et al., 2005), the proportion of neutral targets (inkblots) rated as pleasant as opposed to unpleasant following White racial primes, Black racial primes, and neutral primes was used to estimate implicit racial attitudes. As in Study 1, we predicted that implicit positivity toward racial ingroup members would emerge for younger, but not older, children. In addition, we predicted that we would find no evidence of negative affect in response to Black exemplar primes in either early or late childhood.

Method

Pilot Study: Validation of a Child-Friendly Race AMP

As the AMP had not been previously used as an implicit measure of children's racial attitudes, a pilot study was conducted to determine whether children could successfully complete the Child-Friendly AMP (Child AMP) and whether the measure would demonstrate the anticipated pattern of results. Thirty-eight White children with parental permission were individually tested in a public school located in the Greater Toronto Area. Data were collected in December 2011. The sample consisted of 17 younger children who ranged from 6 years, 7 months to 8 years, 8 months (8 boys, 9 girls; median age = 7 years, 11 months) and 21 older children who ranged from 9 years, 1 month to 11 years, 2 months (14 boys, 7 girls; median age = 9 years, 10 months). Parents reported a modal annual household income of $100,000–$150,000 and 53% had obtained at least one university degree.

Children first completed an adapted version of the AMP (Child AMP). Images of eight White and eight Black boys, as well as eight gray squares, were used as the race and neutral primes, respectively. Target images were inkblots that were pretested to be neutral in valence (Williams et al., 2016). The Child AMP was presented as a judgment game (Payne et al., 2005) where children were told that they would briefly see inkblots and their task

was to indicate whether the inkblot was "nice" or "not so nice" by pressing one of two computer keys. Participants were told "to warn you that the inkblot is coming, you will see a real-life image before each inkblot," but it was stressed that we were only interested in what children thought about the inkblot and each child was asked to "tell us about the *inkblot* as best you can, no matter what picture is in front of it." A pictorial header always remained on screen to remind children of their response options. Each trial began with a blank screen for 520–1,020 ms, followed by a prime image in the center of the screen for 180 ms, a blank screen for 300 ms, an inkblot for 240 ms, and finally a mask that remained visible until a response was made. In each trial, the inkblot was randomly selected without replacement. Each prime image was seen twice, thus children completed 48 critical trials (White, Black, and neutral primes). To validate the measure, children subsequently completed 32 trials containing normatively positive and negative primes (α = .80; Payne et al., 2005; Williams et al., 2016; see Data S1). Finally, children completed a Child IAT comparable to the one used in Study 1 (see Data S1 for more information).

Child AMP.   The proportion of inkblots judged as pleasant following each type of prime was calculated separately, resulting in distinct White, neutral, and Black priming indices (Payne et al., 2005). To test our predictions, we conducted a 3 (prime: White vs. neutral vs. Black) × 2 (age of participant: younger vs. older) mixed ANOVA with the first factor within-subjects. A main effect of prime emerged, $F(2, 35) = 10.10$, $p < .001$, $\eta_p^2 = .37$, that was qualified by a significant Prime × Age interaction, $F(2, 35) = 4.21$, $p = .02$, $\eta_p^2 = .19$. Paired-samples t-tests comparing responses following White, neutral, and Black primes revealed that younger children demonstrated a significant priming effect driven by ingroup positivity; they judged a greater proportion of inkblots as pleasant when they followed White primes ($M = 0.67$, $SD = 0.15$) as compared with neutral primes ($M = 0.45$, $SD = 0.18$), $t(16) = 3.36$, $p = .004$, $d = 0.81$, or Black primes ($M = 0.53$, $SD = 0.22$), $t(16) = 2.54$, $p = .02$, $d = 0.62$. By contrast, younger children did not demonstrate evidence of automatic outgroup negativity; inkblots that followed Black primes were not judged as less pleasant than inkblots that followed neutral primes, $t(16) = 0.85$, $p = .41$, $d = 0.21$.

Older children did not demonstrate a race priming effect. Paired-samples t tests revealed no evidence of ingroup positivity; inkblots following

White primes ($M = 0.54$, $SD = 0.12$) were not judged more positively than inkblots following neutral primes ($M = 0.49$, $SD = 0.13$), $t(20) = 1.26$, $p = .22$, $d = 0.27$, or Black primes ($M = 0.51$, $SD = 0.14$), $t(20) = 0.99$, $p = .33$, $d = 0.22$. In addition, there was no evidence of outgroup negativity, as inkblots following Black primes were not judged to be less pleasant than inkblots following neutral primes, $t(20) = 0.41$, $p = .68$, $d = 0.09$. Replicating the results of Study 1, younger—but not older—children demonstrated a reliable priming effect that was driven by ingroup positivity. In addition, both younger and older children failed to show implicit negativity following Black primes.

Child IAT. As in Study 1, both younger ($D = .32$, $SD = 0.46$), $t(15) = 2.75$, $p = .02$, $d = 0.69$, and older ($D = .24$, $SD = .35$), $t(18) = 3.06$, $p = .007$, $d = 0.70$, children demonstrated significant pro-White intergroup bias on the Child IAT, which did not differ by age, $t(33) = 0.54$, $p = .60$, $d = 0.18$.

Main Study

Participants

One hundred twenty-seven White children were recruited from and tested at a community-based science center in the Greater Toronto Area. Data were collected in June 2013. Parents sampled at this location report a mean household income over $100,000 and the majority (> 50%) report having completed at least one university degree. The data from 14 participants were excluded because they did not follow the instructions and either gave the same response for every item ($n = 4$), used a response pattern ($n = 3$), or explicitly reported judging the prime images as compared to the neutral targets ($n = 7$). The final sample of 113 participants included 56 younger children who ranged in age from 5 years, 4 months to 8 years, 11 months (27 boys, 29 girls; median age = 7 years, 5 months) and 57 older children who ranged in age from 9 years, 1 month to 12 years, 7 months (33 boys, 23 girls, one unspecified; median age = 10 years, 7 months). In addition, three children did not complete the Child IAT because of lack of interest ($n = 2$) or time constraints ($n = 1$), and one child's data, with > 10% of responses < 300 ms (Greenwald et al., 2003), were excluded, resulting in a sample of 109 for Child IAT analyses.

Measures

Child AMP. The Child AMP was identical to the task administered in the Pilot Study, with the exception that race primes were color photographs of the eight Black and eight White boys used in Study 1.

Child IAT. The Child IAT was identical to the task administered in the Pilot Study with the exception that pictures of four Black boys and four White boys previously seen in the Child AMP were used as target concept stimuli.

Procedure

Children were individually tested by trained experimenters in a quiet location within the community setting. Each participant completed the Child AMP followed by the Child IAT. The Child AMP was administered as in the pilot study, with the exception that participants first completed two practice trials where stimuli were presented on paper. Children then completed five practice trials on the computer before completing the 48 race prime trials (White, Black, and neutral primes) and 32 reference primes ($\alpha = .65$; see Data S1). The Child IAT was administered as described in Study 1 ($\alpha = .57$).

Results and Discussion

Child AMP

To examine children's implicit racial attitudes, a 3 (prime: White vs. neutral vs. Black) × 2 (age of participant: younger vs. older) mixed ANOVA with the first factor within-subjects was conducted. A main effect of prime emerged, $F(2, 110) = 4.28$, $p = .02$, $\eta_p^2 = .07$, as did a main effect of age, $F(1, 111) = 6.47$, $p = .01$, $d = 0.48$. The Prime × Age interaction was not significant, $F(2, 110) = 1.82$, $p = .17$, $\eta_p^2 = $, see Figure 3. However, to test our main hypotheses, paired-samples t-tests comparing responses following White, neutral, and Black primes were conducted separately for each age group. As expected, younger children demonstrated the predicted ingroup positivity; they were more likely to judge inkblots as pleasant when they followed White primes ($M = 0.60$, $SD = 0.19$) in comparison to neutral primes ($M = 0.55$, $SD = 0.19$), $t(55) = 2.01$, $p < .05$, $d = 0.27$, and marginally in comparison to Black primes ($M = 0.56$, $SD = 0.19$), $t(55) = 1.99$, $p < .06$, $d = 0.27$. In addition, as predicted, inkblots that followed Black primes were not rated differently from inkblots that followed neutral primes, $t(55) = 0.33$, $p = .75$, $d = 0.04$.

Replicating Study 1, inkblots following White primes ($M = 0.52$, $SD = 0.17$) were not judged more

positively than inkblots following Black primes ($M = 0.53$, $SD = 0.13$), $t(56) = -0.26$, $p = .80$, $d = 0.03$, for older children. In this study, both White *and* Black primes resulted in more positive inkblot ratings than neutral primes ($M = 0.46$, $SD = 0.17$) among older children, $t(56) = 2.15$, $p = .04$, $d = 0.29$ and $t(56) = 2.59$, $p = .01$, $d = 0.34$, respectively.

Child IAT

An independent-samples *t*-test comparing D scores (Greenwald et al., 2003) by age revealed that intergroup bias did not differ for younger and older children, $t(107) = -1.49$, $p = .14$, $d = 0.29$. Both younger ($D = .12$, $SD = 0.42$), $t(52) = 2.17$, $p = .03$, $d = 0.30$, and older ($D = .23$, $SD = 0.27$), $t(55) = 6.16$, $p < .001$, $d = 0.82$, children showed a pro-White bias.

Figure 3. Proportion of pleasant responses on the child affect misattribution procedure by prime type and age group for the (a) pilot study and (b) main study in Study 2. Higher scores indicate a higher proportion of pleasant (vs. unpleasant) responses following the respective primes. Error bars represent standard error.
†$p < .10$. *$p < .05$.

Consistent with our main hypothesis and replicating the results of Study 1, younger children in both our pilot study and Study 2 showed implicit ingroup positivity on our exemplar measure, but no evidence of implicit outgroup negativity. In addition, older children in our pilot study showed no implicit racial preferences and, in Study 2, older children showed greater positivity following both White and Black primes, suggesting that older children's biases reflected a more global preference for social stimuli, regardless of race. Importantly, children in our sample showed no evidence of implicit outgroup negativity toward Black exemplars. In both the pilot study and Study 2, category-based pro-White versus Black bias again emerged on the Child IAT and this did not differ by age.

Study 3

One possible reason that we failed to find evidence of outgroup negativity in Studies 1 and 2 is that we made use of Black children, as opposed to adults, as our prime stimuli. Research suggests that Black men can be negatively stereotyped as threatening and hostile (e.g., Devine, 1989). Thus, we reasoned that if implicit negative racial attitudes have been acquired in early childhood, they should be particularly likely to be activated in response to primes depicting Black men. By contrast, if implicit outgroup negativity is acquired later in development (Degner & Wentura, 2010; Dunham et al., 2008; Nesdale, 2007), then there should be no evidence of negativity in early or late childhood in response to outgroup primes, even when the primes belong to this particularly stigmatized group. We tested this possibility in Study 3. Specifically, we selected pictures of racially prototypical Black men and White men with neutral facial expressions as our prime images. Consistent with our previous findings, we anticipated that children would show no evidence of implicit outgroup negativity on the priming measure.

By presenting adult targets in Study 3, we also had the opportunity to test a boundary condition for young children's implicit ingroup positivity, by examining whether positive affect would be activated in response to neutral White men. As noted previously, children do not always spontaneously categorize faces by race (Pauker et al., 2016) and research suggests that they may prioritize other perceptual categories or cues (e.g., emotional expression) during person perception (Degner &
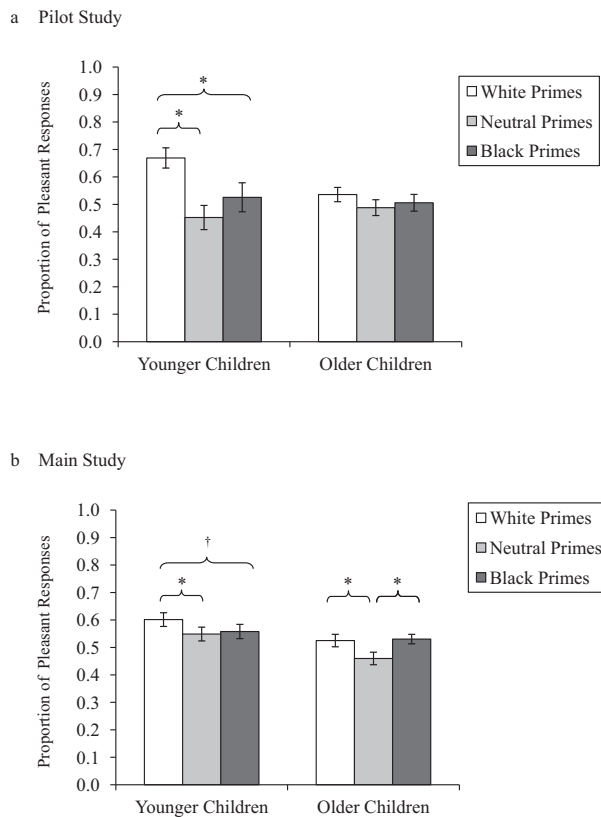
Wentura, 2010; Lipman et al., 2013; Shutts, Banaji, & Spelke, 2010). Given that we were presenting adult men with neutral emotional expressions, we were able to test the possibility that both older *and* younger children would fail to show implicit positivity in response to these adult racial ingroup members when not required to categorize the targets by race. We made this prediction as these adult faces might appear serious or stern to children, eliciting more ambivalent affective responses to these racial ingroup exemplars, even among young children for whom race is typically quite salient (see also Steele et al., 2018; Williams et al., 2016). However, we anticipated that when required to categorize these faces by race, as was the case when completing the Child IAT, racial bias would again emerge, even in response to adult men with neutral emotional expressions.

Method

Participants

One hundred twenty-eight White children were recruited from and tested at a community-based science center in the Greater Toronto Area. Data were collected from February to March 2013. Parents sampled at this location report a mean household income over $100,000 and the majority (> 50%) report having completed at least one university degree. The data from 8 participants were excluded as they either gave the same response for every item ($n = 2$) or explicitly reported judging the prime images instead of the neutral targets ($n = 6$). Furthermore, three children were unable to complete the study because of comprehension ($n = 1$) or technical ($n = 2$) issues. The final sample of 117 participants included 61 younger children who ranged in age from 5 to 8 years (32 boys, 29 girls; median age = 7 years) and 56 older children who ranged in age from 9 to 12 years (22 boys, 34 girls; median age = 10 years). A subsample of 87 children were invited to complete the Child IAT and the responses of nine of these children were not included, either because of technical error (e.g., computer crash; $n = 8$) or comprehension issues ($n = 1$).

Measures

Child AMP.   The Child AMP was comparable to the measure used in Study 2, but presented pictures of adult men with neutral emotional expressions instead of boys as the race primes. In addition, the overall length of the task was reduced; reference primes consisted of five positive and five negative images (see Data S1) and the neutral primes included five gray squares (Payne et al., 2005). Race primes were photographed faces of 10 White and 10 Black adult men with neutral expressions.

Child IAT.   The Child IAT was comparable to the one described in Study 2; however, images of four Black men and four White men previously seen in the Child AMP were used as target concept stimuli (see Data S1 for more information).

Procedure

Children were individually tested by trained experimenters in a quiet location within the community setting. Each participant completed a Child AMP followed by the Child IAT. The Child AMP was administered as in Study 2, with four minor procedural variations. First, children completed two practice trials presented on paper, followed by 10 practice trials on the computer. Second, prime images were displayed for 75 ms, followed immediately by an inkblot presented for 225 ms, and a mask that remained on the screen until a response was made. Third, participants completed 70 randomly ordered critical trials presenting 50 critical primes (White, neutral, and Black) and 20 reference primes ($\alpha = .52$; see Data S1). Finally, four break screens were provided throughout the task and instructions were reinforced during these breaks as necessary. Following the Child AMP, the Child IAT was administered ($\alpha = .69$).

Results and Discussion

Child AMP

A 3 (prime: White vs. neutral vs. Black) × 2 (age of participant: younger vs. older) mixed ANOVA with the first factor within-subjects revealed no main effect of prime, $F(2, 114) = 0.58$, $p = .56$, $\eta_p^2 = .002$, no main effect of age of participant, $F(1, 115) = 0.35$, $p = .56$, $d = 0.11$, and No Prime × Age interaction, $F(2, 114) = 0.06$, $p = .94$, $\eta_p^2 = .001$, see Figure 4.

Using planned comparisons to test our specific hypotheses, paired-samples t tests were conducted separately for each age group. For younger children, inkblots that followed White primes ($M = 0.52$, $SD = 0.18$) were not judged to be more pleasant than inkblots that followed neutral primes ($M = 0.52$, $SD = 0.20$), $t(60) = 0.11$, $p = .91$, $d = 0.01$,
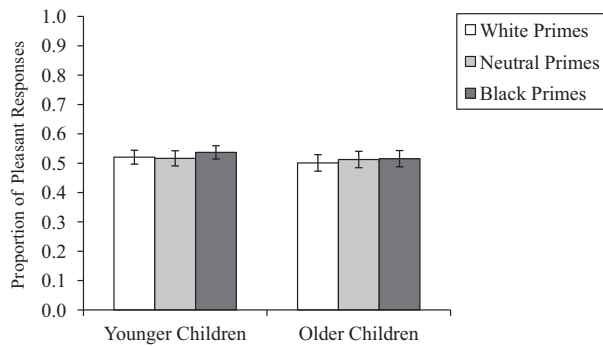
Figure 4. Proportion of pleasant responses on the child affect misattribution procedure by prime type and age group in Study 3. Higher scores indicate a higher proportion of pleasant (vs. unpleasant) responses following the respective primes. Error bars represent standard error.

or Black primes ($M = 0.54$, $SD = 0.18$), $t(60) = -0.78$, $p = .44$, $d = 0.10$. When White adult men with neutral emotional expressions were used as primes, younger children no longer showed implicit positivity toward these members of their racial ingroup. In addition, younger children also showed no evidence of outgroup negativity following Black primes. Inkblots that followed Black primes were not judged to be less pleasant than inkblots that followed neutral primes, $t(60) = 0.68$, $p = .50$, $d = 0.09$.

Replicating Studies 1 and 2, the responses of older children similarly failed to reveal a priming effect. Inkblots that followed White primes ($M = 0.50$, $SD = 0.21$) were not judged to be more pleasant than inkblots that followed neutral primes ($M = 0.51$, $SD = 0.21$), $t(55) = -0.28$, $p = .78$, $d = 0.04$, or Black primes ($M = 0.52$, $SD = 0.21$), $t(55) = -0.67$, $p = .50$, $d = 0.09$. Importantly, inkblots that followed Black primes were also not judged to be less pleasant than inkblots that followed neutral primes, $t(55) = 0.07$, $p = .95$, $d < 0.01$.

Child IAT

As in each of the previous studies, an independent-samples t test revealed no age differences in D scores (Greenwald et al., 2003), $t(76) = 0.54$, $p = .59$, $d = 0.12$. When categorizing these men by race, both younger ($D = .16$, $SD = 0.48$), $t(44) = 2.18$, $p = .03$, $d = 0.33$, and older ($D = .21$, $SD = 0.37$), $t(32) = 3.28$, $p = .003$, $d = 0.57$, children showed a pro-White bias.

In Study 3, there was no evidence that implicit racial bias was activated by adult male primes with neutral emotional expressions. Unlike our previous findings, there was no evidence that younger children misattributed positive affect following these White racial primes. Although speculative, we anticipate that White men with neutral emotional expressions, who could be construed as looking stern or disapproving, were less likely to be categorized primarily by race and thus elicited ambivalent emotions among young children, despite their shared racial group membership. In addition, consistent with the possibility that outgroup negativity is acquired later in development (Degner & Wentura, 2010; Dunham et al., 2008; Nesdale, 2007), Black adult male primes did not elicit implicit outgroup negativity. By contrast, when racial categories were made salient and task-relevant on the Child IAT, intergroup bias emerged early and did not differ by participant age. Thus, in the absence of racial categorization, adult exemplars with neutral emotional expressions did not spontaneously activate race-based affective responses (Degner & Wentura, 2010; Livingston & Brewer, 2002; Olson & Fazio, 2003).

General Discussion

The goal of the current research was to increase our understanding of children's implicit racial attitudes. Across three main studies, we provide evidence that, for White children, implicit positivity toward racial ingroup exemplars is activated and applied early in development (Dunham et al., 2008). Young children were faster to identify positive targets (Study 1) and were more likely to judge neutral inkblots as pleasant (Study 2) when they followed White child primes. When presented with same-aged racial ingroup members, positive affect was spontaneously activated (Studies 1 and 2). In Study 3, we also found a boundary condition of this implicit ingroup positivity. White men with neutral emotional expressions, who might have appeared stern or disapproving, did not activate race-based positivity among young children.

Recent theorizing on the early emergence of implicit racial attitudes has suggested that implicit intergroup biases reflect "rapidly emerging implicit preferences for ingroups and dominant groups" (Dunham et al., 2008, p. 248). Data in support of this possibility have come from studies that make use of the IAT, a measure designed to assess attitudes toward categories (Greenwald et al., 2003). In order to complete this task, children are required to categorize people by race, something that they might not always do spontaneously during person

perception (Pauker et al., 2016). By using different measures of implicit attitudes, in the current studies we provide evidence that, for White children, positive affect can be spontaneously activated by racial ingroup exemplars in early childhood, even when the task does not require that they categorize these exemplars by race.

What is perhaps more interesting is that for older children, positivity in response to racial ingroup members was not consistently activated and applied. This finding is consistent with theorizing suggesting that older children rely less on perceptual cues and instead focus on individual characteristics, such as shared interests, to determine ingroup and outgroup membership (Aboud, 2008). It is possible that as a consequence of this shift in attention, implicit positivity in response to racial ingroup members may wane in late childhood as children better appreciate differences within groups and increasingly focus on attributes other than race to define their ingroups. Although additional research is needed to further elucidate the relation between social categorization and implicit attitudes across development, this possible developmental trajectory is consistent with the results of research by Degner and Wentura (2010) who found age-related differences in the activation of racial prejudice in response to outgroup members. Across four studies, these researchers similarly found no evidence of racial biases on priming measures in late childhood (9–11 years), unless racial categories were made salient and task-relevant.

In addition, across our three studies and two different priming measures, we found little evidence that negativity was spontaneously activated by racial outgroup members in either early (5–8 years) or late (9–12 years) childhood. Even Black men with neutral emotional expressions did not spontaneously elicit negative implicit race-based evaluations. However, across each study, these same children showed implicit intergroup pro-White versus Black bias on the category-based Child IAT and, as with previous findings, the magnitude of bias did not differ by age. The finding of bias on the Child IAT eliminates the possibility that our samples were implicitly unbiased. Instead, this finding is consistent with theorizing suggesting that implicit intergroup biases in childhood are driven largely by implicit positivity toward ingroups and high-status groups (Dunham et al., 2008), and further suggests that children may not show similar affective responses when presented with racial exemplars.

The Developmental Trajectories of Implicit Ingroup and Outgroup Attitudes

Theory and research has suggested that implicit intergroup attitudes emerge early in life at levels that are comparable to that of adults (Baron & Banaji, 2006; Dunham et al., 2008). This position challenged earlier assumptions that implicit racial attitudes are acquired later in development and suggest instead that "prolonged exposure to environmental information is not a necessary condition for the formation of implicit intergroup evaluations" (Dunham et al., 2008, p. 249). The results of the present research are consistent with this initial theorizing. Across three studies, we found similar evidence of implicit pro-White bias on a category-based measure among White children in both early and late childhood.

However, the current results provide the opportunity for some additional consideration about the nature of implicit intergroup attitudes and the conditions under which they are likely to occur. When presented with racial exemplars, only young children showed implicit intergroup biases, and these arose from implicit ingroup positivity and not outgroup negativity. By contrast, older children showed no evidence of implicit racial bias following ingroup or outgroup primes. Despite these age-related differences, we found stable implicit intergroup bias favoring the White racial ingroup on our category-based measure. To account for the discrepant trajectories of bias on category-based and priming measures with older children and adolescents, Degner and Wentura (2010) interpreted their results as providing evidence of "two different yet complementary developmental components of automatic prejudice in childhood and adolescence: An early onset of category-based prejudice automatization and a later onset of exemplar-based prejudice automatization" (p. 372).

Consistent with this possibility, we found evidence of bias on our category-based implicit measure of racial attitudes among young children. However, we found limited evidence of negativity toward outgroup exemplars in early or late childhood. We believe that these findings suggest two complementary developmental components of implicit intergroup attitudes that include implicit ingroup positivity, which is rapidly internalized during early childhood when children are oriented toward perceptually based group differences and are highly sociocentric, and outgroup negativity that can be acquired later in development (Aboud, 2008; Degner & Wentura, 2010; Nesdale, 2007).

These findings also suggest that implicit intergroup attitudes are particularly likely to be activated in contexts and/or on measures which encourage children to construe others in terms of their race (see also Degner & Wentura, 2010).

If implicit ingroup positivity is acquired in early childhood and implicit intergroup attitudes are apparent on a category-based measure in late childhood, why then did our 9- to 12-year-old children not show implicit ingroup positivity on the priming measure? As noted earlier, we believe that this is largely due to children's decreased reliance on perceptual distinctions, such as race, as a spontaneous basis for social categorization and evaluation at this age (e.g., Aboud, 2008). When presented with racially prototypical primes, there are a host of ways that a child might spontaneously categorize the prime, and categorization by race is not inevitable (Gilbert & Hixon, 1991; Livingston & Brewer, 2002; Macrae et al., 1995). On a category-based measure like the IAT, which requires children to categorize by race in order to successfully complete the task, we expected and found implicit intergroup biases of a magnitude similar to previous studies with older children (Baron & Banaji, 2006; Rutland et al., 2005). However, as outlined in Figure 1, when presented with racial primes, racial biases should only be activated and applied if primes are categorized by race, and race-based associations are sufficiently well reinforced that they will be spontaneously activated by this categorization. Although speculative, our data suggest that when participants are not specifically required to categorize exemplars by race, implicit intergroup attitudes may follow a U-shape function—emerging early in childhood during a period of sociocentrism and focus on perceptual group distinctions, waning during middle childhood when reliance on perceptual distinctions such as race decreases, and re-emerging in early adolescence and adulthood, when a there is greater focus on understanding the significance of one's social identities (Aboud, 2008; Nesdale, 2007). Future longitudinal research will be needed to determine whether, and for whom (e.g., majority vs. minority group members) this is the case, and whether young children's implicit ingroup positivity reflects intergroup processes or simply a preference for what is familiar (Zajonc, 1968).

The importance of race salience and racial categorization is highlighted in theorizing by Bigler and Liben (2007) who focus on the early acquisition and development of intergroup attitudes. According to their developmental intergroup theory, racial stereotypes and biases will develop when (a) race is seen as psychologically salient, (b) children begin to categorize others using this psychologically meaningful dimension, and (c) children begin to attach meaning to psychologically salient groups. It is interesting to consider how these core processes might be relevant not only to the acquisition of stereotypes and prejudice but also to the *activation* of stereotypes and prejudice. Our research suggests that implicit racial biases will be activated and applied when race is psychologically or contextually salient, leading targets to be categorized by race, and when racial attitudes have been acquired. In this article, we suggest that developmental processes can influence children's tendency to categorize exemplars primarily by race as well as the likelihood that they have acquired positive or negative attitudes toward the members of specific racial groups. However, similar to theorizing by Bigler and Liben (2007), we believe that additional factors, both internal and external to a child, can affect children's tendency to chronically use race as a psychological meaningful basis for categorization and the likelihood that they have acquired consistent positive or negative attitudes toward members of a racial group that can be automatically activated. Delineating these conditions both empirically and theoretically will be an important avenue for future research.

Limitations and Future Directions

Although this research provides additional insight into the emergence of implicit racial attitudes in childhood, the findings are limited in several ways. The cross-sectional design of these and other studies limit our ability to develop a more comprehensive model of children's implicit racial attitudes. In addition, the current research focused exclusively on the racial attitudes of White children in one specific racially diverse cultural context (Toronto, Canada) toward their majority racial ingroup and one specific minority racial outgroup. Future longitudinal research, with larger sample sizes, more diverse samples, and novel measures will be needed to better understand the early development of implicit racial attitudes among both majority and minority children (see Dunham et al., 2006; Gonzalez, Steele, & Baron, 2017; Newheiser & Olson, 2012).

More research is also needed to better determine the universality of these effects among majority children in different cultural contexts (e.g., Pauker et al., 2016). Based on the current research alone, it cannot

be determined whether children *could* show implicit racial or ethnic negativity during early and middle childhood in communities with social norms that accept or encourage racial and ethnic prejudice, and this is an important avenue for future research. Although we argue that our effects are driven primarily by developmental processes, including ingroup favoritism in early childhood and a shift from perceptual to cognitive-based processing in late childhood, we cannot rule out the possibility that in other cultural and historical contexts, racial exemplars from stigmatized outgroups could activate negativity earlier in development. Start of new paragraph here.

Through future research it will also be important to examine which, if any, of these implicit racial attitudes best predicts intergroup behavior. Based on these findings, it would be premature to conclude that implicit ingroup preferences alone do not result in some forms of negative behavior toward the outgroup (Allport, 1954/1979; Brewer, 1999), as biased intergroup attitudes and behavior can arise from ingroup positivity. As such, future research should aim to identify the conditions under which implicit racial attitudes predict intergroup behavior during childhood, as has been done with adults (Greenwald et al., 2009).

Finally, while these findings might seem to suggest that adults should discourage children from attending to racial group membership, some caution must be taken with this approach. There is research to suggest that non-Black children are less likely to identify and report racial discrimination after being exposed to colorblind messaging, as opposed to diversity valuing messaging (Apfelbaum, Pauker, Sommers, & Ambady, 2010). Consistent with these findings, we anticipate that diversity valuing messaging, combined with conversations that serve to challenge children's stereotypes and essentialist thinking (Gelman, 2003), will help to decrease implicit racial biases, and this is an important avenue for future research. This might be particularly true in cultural contexts where the explicit use of racial labels and/or de facto segregation increase the probability that race becomes psychologically salient to children (Bigler & Liben, 2007) and that negative attitudes toward the outgroup are reinforced.

In summary, using a similar age group in a different cultural context and with a new measure, we have replicated previous research demonstrating a lack of implicit racial bias among older children on exemplar-based priming measures (Degner & Wentura, 2010). We also provide preliminary evidence that on these priming measures, intergroup biases emerge among younger children in the form of ingroup positivity but not outgroup negativity. It is worth noting that when children were asked to categorize others by race, both younger and older children demonstrated intergroup biases that emerged early and remained stable across development. Taken together, these findings highlight the importance of using exemplar-based priming tasks, in addition to existing category-based measures, in order to gain additional insight into children's implicit attitudes.

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Supporting Information

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

Data S1. Information on stimuli and measure validation (AMP)