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SHORT REPORT

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Bias at the intersection of race and gender: Evidence from preschool-aged children

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Abstract

There is ample evidence of racial and gender bias in young children, but thus far this evidence comes almost exclusively from children's responses to a single social category (either race or gender). Yet we are each simultaneously members of many social categories (including our race and gender). Among adults, racial and gender biases intersect: negative racial biases are expressed more strongly against males than females. Here, we consider the developmental origin of bias at the intersection of race and gender. Relying on both implicit and explicit measures, we assessed 4-year-old children's responses to target images of children who varied systematically in both race (Black and White) and gender (male and female). Children revealed a strong and consistent pro-White bias. This racial bias was expressed more strongly for males than females: children's responses to Black boys were less positive than to Black girls, White boys or White girls. This outcome, which constitutes the earliest evidence of bias at the intersection of race and gender, underscores the importance of addressing bias in the first years of life.

KEYWORDS

gender bias, intersectionality, preschool, racial bias, social bias, social cognitive development

1 | INTRODUCTION

Over the course of our lifetimes, we develop biases about individuals and groups based on their membership in social categories, including race and gender. These social biases reflect cultural mindsets, stereotypes, and prejudices that are pervasive in our communities. Adults' social biases are resistant to lasting change (Bigler, 2013; Bigler & Liben, 2007; Dunham, Baron, & Banaji, 2008; Joy-Gaba & Nosek, 2010; Lai et al., 2016; Rudman, 2004) and reflect nuanced patterns at the intersection of race and gender (Else-Quest & Hyde, 2015; Kang & Bodenhausen, 2015). Because social biases like these can have negative consequences for individuals and societies (Richeson & Sommers, 2016), psychologists have sought to identify their roots.

There is now considerable converging evidence that attention to race and gender emerges in infancy (Aboud, 1988; Hailey & Olson, 2013). Infants show visual preferences for individuals whose gender and race match those of their primary caregiver and the individuals closest to them (Anzures et al., 2013; Bar-Haim, Ziv, Lamy, & Hodes, 2006; Heron-Delaney et al., 2011; Kelly et al., 2007, 2005; Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002). These early preferences shape infants' visual perception of others, guiding them to distinguish more precisely among own-race individuals and less precisely among other-race individuals (for review, see Sugden & Marquis, 2017). By the preschool years, children demonstrate more than perceptual tuning: they use social categories—including those based on race, gender, and even arbitrary features (e.g., "minimal groups")—as an inductive base to guide their judgments and expectations about individuals they have never encountered (Diesendruck & Eldror, 2011; Dunham, Baron, & Carey, 2011). They also harbour implicit

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and explicit preferences for members of their own racial group (Bian, Leslie, & Cimpian, 2017; Cvencek, Greenwald, & Meltzoff, 2011; Dunham, Chen, & Banaji, 2013; Qian et al., 2015; Qian, Quinn, Heyman, Pascalis, & Lee, 2017b; Setoh et al., 2017; Xiao et al., 2014).

Certainly, children's emerging social biases are not as intricate as those of adults. Furthermore, in contrast to the social biases held by adults, those of infants and young children are highly malleable. Merely exposing infants to other-race individuals can reverse their racial preferences for own-race individuals (Bar-Haim et al., 2006; Heron-Delaney et al., 2011; Lee, Quinn, & Pascalis, 2017). Yet by 4–6 years, mere exposure is no longer enough: children must be taught directly to distinguish other-race individuals ("individuation training"). The effect of such training is impressive, erasing children's expression of implicit racial bias for several months (Qian, Quinn, Heyman, Pascalis, & Lee, 2017a; Qian et al., 2017b; Xiao et al., 2014).

Notice, however, that young children's sensitivity to their input is a double-edged sword: negative social biases can just as easily be induced or intensified when children witness expressions of social bias, intentional or unintentional. One powerful source of social bias is language. Naming the social category of which an individual is a member (e.g., "That child is Black," "Pat is a woman") and using generic language (e.g., "Americans are individualistic") facilitate children's establishment of social categories and amplify the inductive strength of these categories in children's reasoning about others (Diesendruck & Deblinger-Tangi, 2014; Rhodes, Leslie, Bianchi, & Chalik, 2017; Rhodes, Leslie, & Tworek, 2012; Waxman, 2010). Disturbingly, racial and gender biases are expressed so pervasively in natural discourse that even machine learning algorithms, provided with natural language corpora, acquire those biases from the input alone (Caliskan, Bryson, & Narayanan, 2017). Other powerful sources of bias are nonverbal. For example, simply witnessing an adult's expression of negative nonverbal affect toward one individual provides an entry point for children to generalize negative impressions toward other individuals of the same group (Skinner, Meltzoff, & Olson, 2017).

Unfortunately, children witness the expression of social bias even in their classrooms (Gilliam, Maupin, Reyes, Accavitti, & Shic, 2016; Okonofua & Eberhardt, 2015). Although this may be unintentional, teachers of all races nevertheless appear to express social bias in their classroom interactions. Of particular note is the "intersectional bias" expressed toward Black males. It is now well-documented that adults evaluate Black men more negatively than Black women, White men, or White women (Kang & Bodenhausen, 2015; Navarrete, McDonald, Molina, & Sidanius, 2010; Purdie-Vaughns & Eibach, 2008; Sidanius & Veniegas, 2000). This intersectional pattern, which has also been documented in adults' evaluations of Black boys (Todd, Thiem, & Neel, 2016), is evident in preschool teachers, whose eye gaze patterns suggest they expect Black boys to be the source of classroom trouble more than Black girls, White boys, or White girls (Gilliam et al., 2016).

What remains unknown is whether preschool-aged children are sensitive to this pernicious pattern of intersectional bias that surrounds them. This is because to-date, the experimental evidence concerning social bias in preschool-aged children has focused almost exclusively on a single social category at a time (e.g., either race or gender). Perhaps preschool-aged children are not yet sensitive to intersectional patterns of bias, and instead focus on only a single social category at a time (either race or gender, but not both simultaneously); this would echo Piaget's classic observation that preschoolers successfully focus on only one dimension at a time (e.g., either an object's color or shape, but not both) (Inhelder & Piaget, 1964). But it is also possible that preschool-aged children are indeed sensitive to intersectional patterns of bias. After all, they are sensitive to subtle verbal and nonverbal expressions of adults' bias. If young children are sensitive to intersectional biases, then they may respond less positively to Black boys than to Black girls, White boys, and White girls.

RESEARCH HIGHLIGHTS

- Preschool-aged children's implicit and explicit evaluations of Black boys were less positive than their evaluations of Black girls, White boys, or White girls.
- This intersectional pattern of bias ("gendered racial bias") mirrors social bias observed in adults, which is evident even in preschool classrooms.
- Although children showed the same intersectional pattern of bias on both implicit and explicit tasks, their implicit and explicit biases were not correlated.

Here we address this question directly, focusing on 4-year-old children's responses to other children who vary systematically in both race and gender. Our motivation for examining preschool-aged children was straightforward. First, the preschool years represent an inflection point when most children begin to interact more broadly with individuals beyond their families and close others. This broader social exposure affords children the opportunity to observe the social biases evidenced in their communities. Second, we sought to strengthen the empirical foundation for addressing bias in the preschool years, when social biases are less resistant to change than in older children and adults (Qian et al., 2017a, 2017b; Xiao et al., 2014).

We adapted an implicit bias task (the Affective Misattribution Procedure [AMP]; Payne, Cheng, Govorun, & Stewart, 2005) and an explicit bias task (explicit liking; Dunham et al., 2011) to accommodate 4-year-old children. The AMP has shed light on a wide range of attitudes in adults, from prejudice to psychopathology (Payne & Lundberg, 2014). It is also well-suited for children because it requires no deliberation or introspection and does not rely upon reaction times. Recently, the AMP has successfully identified affective responses in children: 5- to 10-year-olds rated neutral images following happy faces as "nicer looking" than those following sad faces (Williams, Steele, & Lipman, 2016). Moreover, among White 5- to 8-year-olds, the AMP has revealed evidence of racial ingroup positivity. In a study that only included faces of boys as primes, children favoured neutral images following White faces marginally over those following Black faces (Williams & Steele, 2017). Here we use the AMP to assess preschool children's affective responses to individuals that vary in both race and gender.

2 | STUDY 1

Our first goal was to assess whether the AMP is sufficiently sensitive to detect race and gender bias in children as young as 4 years of age and, if so, whether children's responses reflect bias at the intersection of race and gender.

2.1 | Method

2.1.1 | Participants

Thirty children (13 females) aged 4–5 years (*M* = 4.58 years, *SD* = 0.36 years), recruited from a Northwestern University participant registry of families in the greater Evanston, IL area were included in the final analyses (19 White (63%); 11 non-White (37%) (2 Black, 2 Asian, 1 Latino, 6 Multiracial)).[1] Parents provided information about their children's exposure to racial diversity in their homes and preschools.[2] Another 24 children participated but were excluded because they provided the same response on all trials (9), failed to complete the study (3), or responded too quickly (before the mask appeared; see procedure below) on most trials (12). All participants received a book and toy as compensation. Sample size was determined based on prior implicit bias studies in preschool-aged children (Qian et al., 2017b; Xiao et al., 2014).

2.1.2 | Materials and procedure

In the pretest-training phase, an experimenter presented a sequence of 10 pairs of printed images side-by-side: one with a positive valence and the other a negative valence (e.g., cute puppy vs. snarling dog). For half of the trials, participants were asked to indicate which image in the pair was "nice;" for the remaining trials, participants were asked to indicate which was "not nice." This insured that participants understood that they could provide positive and negative responses; all participants labelled the images correctly.

The experimenter then sat next to the child at the study computer. She explained that some pictures would appear on the screen and the child's job was to help another person (a second experimenter, seated behind the screen) know if each picture was nice or not. To illustrate, an image appeared on the screen (a Chinese character) and the experimenter said the child should look for "pictures just like this one" and say whether it was "nice looking" or "not nice looking." Next, the Chinese character was masked with a grey square. The experimenter told the child to wait for this grey square before saying if the picture was "nice looking" or "not nice looking." The experimenter continued, "You might see colourful pictures (valenced primes) sometimes, but those don't matter. The pictures you're looking for will come super-fast, so you have to look really carefully and keep your eyes on the screen so you can find them."

There were two trial types: validation (*N* = 16) and experimental (*N* = 64). In each trial, stimuli included a prime, a neutral image, and a grey mask (all 256 × 256 pixels and found via a Google search). For validation trials, primes were affectively positive (e.g., cute puppy) or negative (e.g., snarling dog) images; for experimental trials, primes were Google images of smiling faces of Black and White girls and boys (approximately 4–8 years). There were four images per race and gender combination, totaling 16 faces. Neutral images were Chinese characters. The mask was a grey square. Each trial followed the same progression (Figure 1): a prime (75 ms), followed by a blank screen (125 ms), followed by a Chinese character (225 ms), followed finally by a grey mask that remained until the child reported whether the Chinese character was "nice looking" or "not nice looking." After 16 practice trials, children completed validation and experimental trials. Our dependent variable was the proportion of children's "nice looking" ratings for neutral images following a particular category of primes (validation trials: positive and negative primes; experimental trials: Black boys, Black girls, White boys, White girls).

3 | RESULTS

On validation trials, children rated neutral images following positive primes significantly more positively (*M* = 0.69, *SD* = 0.21) than those following negative primes (*M* = 0.48, *SD* = 0.30), $t(29) = 3.22$, $p = 0.003$, 95% CI [0.076, 0.341], Cohen's $d = 0.588$. This provided assurance that the AMP is sufficiently sensitive to measure affective responses in 4-year-old children.

On experimental trials, children rated neutral images following primes of individual child faces; these smiling faces varied in race (Black or White) and gender (male or female). We submitted children's responses to a 2 (target race: Black or White) × 2 (target gender: male or female) within-subjects ANOVA (Figure 2). A main effect for race revealed that children rated neutral images following White faces (*M* = 0.73, *SD* = 0.19) significantly more positively than those following Black faces (*M* = 0.68, *SD* = 0.22), $F(1, 29) = 4.40$, $p = 0.045$, 95% CI [0.001, 0.093], $\eta_p^2 = 0.132$. In addition, children rated neutral images significantly more positively if they followed female (*M* = 0.73, *SD* = 0.19) than male faces (*M* = 0.68, *SD* = 0.21), $F(1, 29) = 5.13$, $p = 0.031$, 95% CI [0.004, 0.089], $\eta_p^2 = 0.150$. These main effects were modified by a significant target race × gender interaction $F(1, 29) = 4.87$, $p = 0.035$, $\eta_p^2 = 0.143$.

We next tested whether children exhibited a gendered-race bias, disfavouring Black males in particular. To do so, we conducted a one-way repeated measures ANOVA using an a priori contrast coded as −3, 1, 1, 1 for Black boys (*M* = 0.63, *SD* = 0.25), Black girls (*M* = 0.73, *SD* = 0.20), White boys (*M* = 0.73, *SD* = 0.19), and White girls (*M* = 0.73, *SD* = 0.22), respectively. Indeed, children rated neutral images significantly less positively if they followed pictures of Black boys than all other targets, $F(1, 29) = 18.33$, $p < 0.001$, 95% CI [−0.428, −0.151], $\eta_p^2 = 0.387$. This constitutes the first evidence

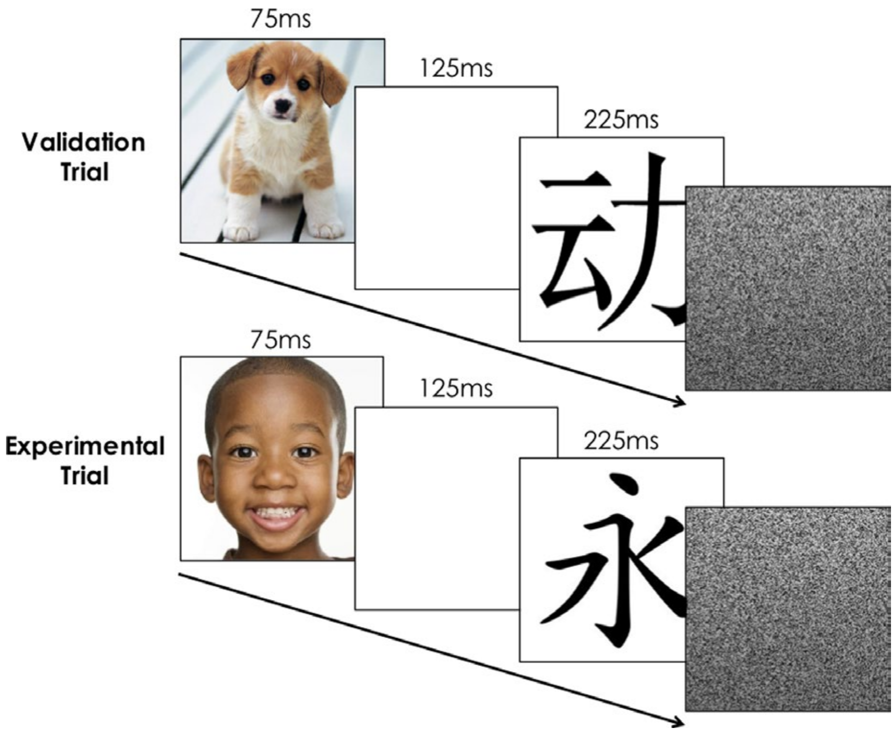

FIGURE 1 A representative set of stimuli for Affective Misattribution Procedure validation and experimental trials. All trials began with a prime (in validation trials, a positive or negative image; in experimental trials, a child's face), followed by a blank screen, then a neutral target (Chinese character), and finally a grey mask that remained on screen until participants provided a response

of implicit affective bias at the intersection of race and gender in preschool-aged children.

4 | STUDY 2

Our next goal was to advance this evidence in three ways. First, to extend its generalizability, we conducted the AMP again with a new sample of 4-year-olds and a new set of child faces. Second, to bring our findings into closer alignment with evidence examining the effect of facial expressions on children's AMP ratings (Williams et al., 2016), we presented primes displaying neutral (rather than smiling) expressions. Third, to examine the relation between children's implicit and explicit bias, we engaged them in an explicit liking task.

4.1 | Method

4.1.1 | Participants

Thirty children (18 females) aged 4–5 years (M = 4.60 years, SD = 0.52 years), recruited from the same database as in Study 1, were included in the final analyses (18 White (60%); 12 non-White (40%) (1 Black, 4 Asian, 1 Hispanic, 6 Multiracial)). Another five children participated but were excluded because they did not complete the study (2) or responded too quickly (before the mask appeared) for the majority of trials (3). One child completed the AMP but not the explicit liking task. All participants received a book and toy as compensation.

4.1.2 | Materials and procedure

Children first participated in the AMP. The procedure was identical to Study 1, but featured a new set of 4- to 5-year-old children's faces from the CAFE database (LoBue & Thrasher, 2015). Unlike Study 1, where target children were smiling (as in Williams et al., 2016), those in Study 2 wore neutral expressions. Next, children participated in an explicit liking task (Dunham et al., 2011). They viewed the faces they had seen during the AMP, one at a time in random order. Children rated each face using a 6-point scale (1 = "really don't like"; 6 = "really like").

4.2 | Results

4.2.1 | Affective Misattribution Procedure

In validation trials, children rated neutral images following positive primes (M = 0.76, SD = 0.21) significantly more positively than those following negative primes (M = 0.35, SD = 0.31), $t(29)$ = 5.90, p < 0.001, 95% CI [0.264, 0.544], Cohen's d = 1.077. In experimental trials, a 2 (target race: Black or White) × 2 (target gender: male or female) within-subjects ANOVA revealed a main effect of target race, $F(1,29)$ = 6.40, p = 0.017, 95% CI [0.011, 0.109], η_p^2 = 0.181. Children rated neutral images significantly more positively if

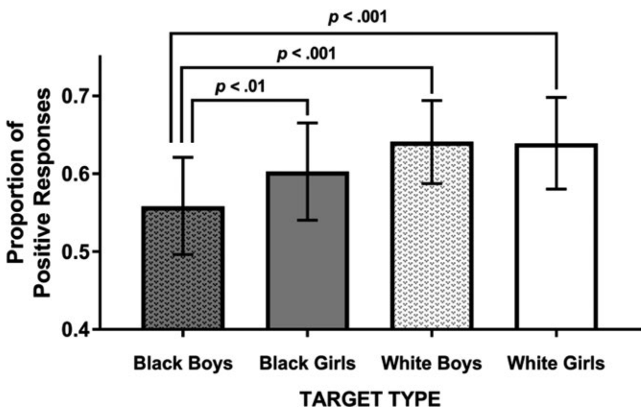

FIGURE 2 Combined Affective Misattribution Procedure results (Studies 1 and 2). Children rated neutral images significantly less positively if they followed pictures of Black boys than all other targets. No other comparisons (Black girl vs. White boy, Black girl vs. White girl, and White boy vs. White girl) were significant

they followed White faces (*M* = 0.60, *SD* = 0.24) than Black faces (*M* = 0.54, *SD* = 0.28). There was no main effect of target gender and no interaction between target race and target gender (both *ps* > 0.46).

The a priori contrast analysis provided support for the gendered racial bias: as in Study 1, children rated neutral images significantly less positively if they followed images of Black boys (*M* = 0.53, *SD* = 0.31) than if they followed pictures of Black girls (*M* = 0.55, *SD* = 0.30), White boys (*M* = 0.59, *SD* = 0.26), and White girls (*M* = 0.61, *SD* = 0.26), $F(1, 29) = 6.08$, $p = 0.020$, 95% CI [−0.320, −0.030], $\eta_p^2 = 0.173$.

4.2.2 | Explicit liking

We submitted participants' ratings to a 2 (target race: Black or White) × 2 (target gender: male or female) within-subjects ANOVA. This revealed a main effect of target race, $F(1,28) = 8.79$, $p = 0.006$, 95% CI_{Mdiff} [0.144, 0.787], $\eta_p^2 = 0.239$. Children favoured White targets (*M* = 4.05, *SD* = 1.00) significantly over Black targets (*M* = 3.59, *SD* = 1.05); this pattern was observed in White and non-White participants. There was also a main effect of target gender, $F(1,28) = 14.31$, $p = 0.001$, 95% CI [0.411, 1.382], $\eta_p^2 = 0.338$. Children favoured female targets (*M* = 4.27, *SD* = 1.07) significantly over male targets (*M* = 3.37, *SD* = 1.18). Both main effects were moderated by a significant target race × target gender interaction, $F(1,28) = 5.17$, $p = 0.031$, $\eta_p^2 = 0.156$.

The a priori contrast analysis indicated that children rated Black boys (*M* = 3.01, *SD* = 1.27) significantly less positively than Black girls (*M* = 4.16, *SD* = 1.28), White boys (*M* = 3.72, *SD* = 1.32), and White girls (*M* = 4.37, *SD* = 1.08), $F(1,28) = 28.61$, $p < 0.001$, 95% CI [−4.459, −1.989], $\eta_p^2 = 0.505$. An analysis of individual children's responses provided converging evidence: 80% (24/30) of children liked Black boys significantly less than at least two of the other groups, binomial $p < 0.001$. Children's racial preferences in the explicit task did not predict their racial preferences on the AMP, $r(28) = 0.299$, $p = 0.115$.

5 | OMNIBUS ANALYSIS: STUDIES 1 AND 2

Because the AMP procedure was identical in Studies 1 and 2, we submitted children's responses to an omnibus mixed-design ANOVA, using target race (Black or White) and target gender (male or female) as within-subject factors and facial affect (smiling [Study 1] or neutral [Study 2]) as a between-subjects factor. This combined data set, which provided greater power to examine effects of participants' own race (White or non-White), gender (male or female), and exposure to racial diversity, offers converging evidence for bias at the intersection of race and gender in 4-year-old children (Figure 2).

Children favoured neutral images that followed smiling faces (Study 1: *M* = 0.69, *SD* = 0.23) significantly more than those that followed neutral faces (Study 2: *M* = 0.54, *SD* = 0.22), $F(1,52) = 6.67$, $p = 0.013$, 95% CI [0.034, 0.269], $\eta_p^2 = 0.114$. This is consistent with evidence that the AMP demonstrates children's sensitivity to facial affect (Williams et al., 2016).

A main effect of target race, $F(1,52) = 8.27$, $p = 0.006$, 95% CI [0.015, 0.086], $\eta_p^2 = 0.137$, revealed that children favoured neutral images following White faces (*M* = 0.64, *SD* = 0.21) more than those following Black faces (*M* = 0.59, *SD* = 0.26). Importantly, this pro-White bias was not driven by White participants alone. White children (*N* = 37) favoured neutral images following White faces (*M* = 0.71, *SD* = 0.20) significantly more than those that followed Black faces (*M* = 0.65, *SD* = 0.23), $t(36) = -2.34$, $p = 0.025$; non-White children (*N* = 23) also favoured neutral images following White faces (*M* = 0.60, *SD* = 0.25) significantly more than those following Black faces (*M* = 0.54, *SD* = 0.30), $t(22) = -2.37$, $p = 0.027$. There was a marginal effect of target gender, $F(1,52) = 3.22$, $p = 0.079$, 95% CI [−0.004, 0.073], $\eta_p^2 = 0.058$: children favoured neutral images following female (*M* = 0.65, *SD* = 0.24) over male faces (*M* = 0.62, *SD* = 0.25). These main effects were qualified by a significant target race × target gender interaction, $F(1,58) = 4.86$, $p = 0.032$, $\eta_p^2 = 0.025$.

The a priori contrast revealed that children responded significantly less positively to Black boys (*M* = 0.58, *SD* = 0.28) than to any other group, including Black girls (*M* = 0.64, *SD* = 0.27), White boys (*M* = 0.66, *SD* = 0.24), and White girls (*M* = 0.67, *SD* = 0.25), $F(1,59) = 22.31$, $p < 0.001$, 95% CI [−0.331, −0.134], $\eta_p^2 = 0.274$. Indeed, 65% (39/60) of children rated neutral images following Black boys less positively than those following faces of at least two other groups, binomial $p < 0.001$.

There were no other significant interactions between target race and participant race, target gender and participant gender, or facial affect and either target race or target gender, all *ps* > 0.6. Children's exposure to diversity (parental report) also did not correlate with their expression of racial bias on the AMP, $r = 0.023$, $p = 0.865$.

6 | DISCUSSION

We found that children as young as 4 years of age demonstrate implicit and explicit bias at the intersection of race and gender.

Although children generally responded positively to other children, they responded less positively to Black boys than to Black girls, White boys, and White girls. This outcome, which mirrors pernicious patterns of bias present in their social worlds (Gilliam et al., 2016; Navarrete et al., 2010; Purdie-Vaughns & Eibach, 2008; Sidanius & Pratto, 1999), was exhibited by both White and non-White children and was uncorrelated with their exposure to diversity.

These results provide a strong foundation for advancing our understanding of the origins of social bias. They also raise new questions. First, what is the developmental trajectory of social bias in children being raised in different social environments? Our participants were predominantly White children from a majority White, middle-class US community. It will be important to broaden this empirical base by including more children from diverse racial, cultural, and socioeconomic backgrounds and by examining the emergence of social bias in communities where race, majority status, and social status may be less intertwined (e.g., Shutts, Kinzler, Katz, Tredoux, & Spelke, 2011). The racial effects reported here could reflect an own-race bias, a majority-race bias, and/or a social status bias. Although disentangling these alternatives will require additional data, the own-race effect (ORE) alone is unlikely to account for the bias documented here. According to the ORE (and ingroup favouritism), racial bias should be symmetrical: White children should favour White children and non-White children should favour non-White children. This was not the case: White and non-White children showed the same patterns of racial bias, suggesting that in this community, young children's expression of bias is likely influenced by power, social status, and/or majority status (see Qian et al., 2015 for evidence from children's racial attitudes in China).

Second, how do infants' early perceptual preferences (Kim, Johnson, & Johnson, 2015; Quinn et al., 2008) become imbued with the stereotypes and prejudices that underlie social biases in older children and adults—biases that undergird our judgments of others' behaviors and motivations? Adults' social biases reflect a complex interplay between direct experiences with others and the stereotypes that pervade their communities (Gawronski & Bodenhausen, 2006). But for children who have not yet acquired a lifetime of experience, how do social biases unfold? Certainly, perceptual experience is instrumental. Infants' prefer faces of individuals that most resemble their closest caregivers and community members (Anzures et al., 2013; Bar-Haim et al., 2006; Heron-Delaney et al., 2011; Kelly et al., 2007, 2005; Lee et al., 2017; Quinn et al., 2002; Xiao et al., 2014). This, coupled with the long-lasting effects of perceptual learning on children's bias (Qian et al., 2017b; Xiao et al., 2014), supports the perceptual-social linkage hypothesis: early perceptual learning provides a placeholder for the emergence of conceptually richer forms of social bias (Lee et al., 2017). Yet perceptual learning cannot solely account for social bias. Infants and young children are also astute observers of the social world (Baillargeon, Scott, & Bian, 2016; Hamlin, Wynn, & Bloom, 2007; Mahajan & Wynn, 2012; Woodward, 2005; Xu & Kushnir, 2013). They gradually absorb the underlying evaluative content of the stereotypes of their communities and become increasingly attuned to social category labels (Rhodes et al., 2012; Waxman, 2010), social status (Dunham et al., 2013; Shutts et al., 2011), and the biases exhibited by family members (Castelli, Zogmaister, & Tomelleri, 2009) and teachers (Okonofua & Eberhardt, 2015). What remains unknown is how young children's perceptual biases make contact with the more abstract and culturally complex stereotypes that they encounter in their communities. Addressing this issue will require identifying the relation between perceptual and social learning, the mechanisms upon which they rely, and the categories over which they operate (e.g., race and gender).

Third, what is the relation between implicit and explicit bias across development? Among adults, this relation is complex (Frith & Frith, 2008; Gawronski & Bodenhausen, 2006) and a dissociation between implicit and explicit bias is well-documented (e.g., Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). The evidence reported here suggests that this dissociation is present in children (Baron & Banaji, 2006; Qian et al., 2015). We observed the same pattern of gendered-racial prejudice on our implicit and explicit tasks, but individual children's performance on these tasks was uncorrelated. Why might this be? Although adults may disavow implicit biases when articulating explicit, propositional attitudes (Gawronski & Bodenhausen, 2006), this is unlikely to be the case for 4-year-olds, who are still learning the "rules" of explicit social evaluation (Rutland, 2013) and unlikely to systematically regulate their explicit expressions. Future research should trace how patterns of implicit-explicit dissociations emerge over development.

In conclusion, these findings underscore the importance of addressing bias even before children reach kindergarten. Investigating how social biases emerge in diverse racial, ethnic, and demographic contexts will be essential for identifying how children's social environments shape the biases they come to hold. In our view, this evidence will be key for raising the next generation with less pernicious racial and gender biases than our own.

ENDNOTES

[1]This mirrors the demographics of the surrounding community of Evanston (60% White, 17% Black/African American, 11% Hispanic, 10% Asian, 3% multiracial or other). As in most US cities, Whites in Evanston have a higher mean income than other groups.

[2]Eighty-three percent of our participants attended preschool.

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