*Journal of Social Issues, Vol. 70, No. 1, 2014, pp. 81–98*
*doi: 10.1111/josi.12048*

# Of Affect and Ambiguity: The Emergence of Preference for Arbitrary Ingroups

**Yarrow Dunham***
*Yale University*

**Jason Emory**
*University of California, Merced*

*What cognitive and affective processes underlie the all-too-human tendency toward group-based affiliation and exclusion? Using a paradigm in which children are randomly assigned to previously unfamiliar and meaningless "minimal" social groups, we investigate the developmental origins of the tendency to prefer and positively evaluate the actions of social ingroup members. Using a procedure derived from evaluative priming as well as children's verbal descriptions of intergroup encounters, we show that 6-year olds but not 3-year olds manifest robust ingroup preference. These results suggest that the mechanisms underlying the wide range of human social group affiliations undergoes a striking increase in generality between ages 3 and 6, perhaps driven by a shift from an individual-level to a group-level or "sociocentric" orientation.*

Decisions about whom to affiliate with or exclude cluster into identifiable collectives. The forms of such collectives are dizzying, from ethnic and racial groups through religious, linguistic, and national distinctions, to identities defined via ideologies or political movements. This variety stands in stark contrast with other primates, who appear to be attentive to just a small set of social categories (namely kinship, gender, and band; Wilson & Wrangham, 2003). Thus, our species places great importance on culturally defined forms of social affiliation, and uses membership (or lack thereof) as an important heuristic governing how to understand and treat others. Why are we so given to group-based social reasoning?

One clue comes from social psychology, where it has long been known that merely dividing social space into "us" and "them" can produce intergroup bias. For

*Correspondence concerning this article should be addressed to Yarrow Dunham, Yale University, Kirtland Hall, New Haven, CT [e-mail: yarrow.dunham@yale.edu].

example, people manifest preferences for previously unfamiliar and meaningless groups to which they have been arbitrarily assigned ("minimal groups"; Brewer, 1979; Tajfel, 1971), and this tendency emerges by age 5 (Dunham, Baron, & Carey, 2011). Whereas explanations for this phenomenon have varied, there is general agreement that it is grounded in some form of self-involvement, for example, a motivation to positively distinguish the ingroup (Tajfel & Turner, 1986) or a lower level process by which self-related positivity spreads to groups associated with the self (Gramzow & Gaertner, 2005). Thus, simply belonging to a group leads us to prefer it, planting the seed for potential differential or exclusionary treatment. Could this be one of the psychological mechanisms supporting bias against culturally familiar groups?

One way to answer this question is to characterize children's reactions to minimal social groups, and ask how they relate to children's well-studied responses to "maximal" groups such as race or gender. If there are close parallels across these two kinds of groups, we can conclude that a determinant of real-world bias is the basic tendency to prefer ingroups, even when minimally defined (Dunham, 2011). Thus, the current research investigates when the tendency to prefer minimal ingroups emerges, and whether the initial form of such preference is a positive evaluation of the ingroup, a negative evaluation of the outgroup, or both.

Prior work has demonstrated that children show minimal group preferences by age 5 (Dunham et al., 2011), including sensitivity to subtle aspects of the groups such as relative status (Bigler, Brown, & Markell, 2001), group size (Brown & Bigler, 2002), and within-group fairness norms (Mulvey, Hitti, Rutland, Abrams, & Killen, 2014). If preference for minimal groups is the result of basic associative processes that transfer self-related positivity to anything associated with the self (Gramzow & Gaertner, 2005), we might expect these preferences to emerge as early as children can comprehend group membership. However, if we look broadly across the developmental intergroup literature, there appears to be a substantial increase in the range of social categories children show interest in between the ages of about 3 and 6. Infants and children under age 3 show social preferences for gender (LaFreniere, Strayer, & Gauthier, 1984), age (Shutts, Banaji, & Spelke, 2010), and linguistic (Kinzler, Dupoux, & Spelke, 2007) ingroups, but it is not until a few years later that preference for other culturally salient social categories such as race, ethnicity, and nationality emerge (Aboud, 1988; Barrett, 2007; Brand, Ruiz, & Padilla, 1974; Cristol & Gimbert, 2008; Shutts et al., 2010; see also Huckstadt & Shutts, 2014). Race is a particularly interesting case because infants can discriminate between faces belonging to different racial groups (Kelly et al., 2005) and can categorize along racial lines in habituation paradigms (Anzures, Quinn, Pascalis, Slater, & Lee, 2009). Thus, the absence of racial preferences in younger preschoolers cannot be attributed to simple perceptual difficulties.

One intriguing possibility is that children undergo a shift from a more "individualistic" to a more "sociocentric" mode of reasoning (Aboud, 1988), i.e., increasing comfort with a range of individual relationships could free children to attend to the myriad ways in which individuals cluster into groups. A useful heuristic might be to pay attention to any group that is consistently pointed out by cultural elders (e.g., Bigler & Liben, 2007), including groups based on a novel distinction such as shirt color. This possibility predicts that the minimal group effect might emerge between ages 3 and 6, and this is one of the central hypotheses that we explored here.

Our second question concerns the initial form of minimal group preference. Is it primarily positivity toward the ingroup, negativity toward the outgroup, or both? Addressing this question will clarify the consequences of minimal group preference: Does it lead to affiliation with ingroups or exclusion of outgroups? To address this question, it is crucial to employ nonrelative measures of attitude that allow an independent assessment of ingroup positivity and outgroup negativity. With respect to real-world groups like race, it has been argued that ingroup positivity is distinct from and perhaps developmentally prior to outgroup derogation (Aboud, 2003; Brewer, 1999). Since we are exploring the possibility that those biases are built on the same mechanism underlying minimal group preference, we predicted that children's bias in the minimal group setting would be driven primarily by increased ingroup liking.

In selecting appropriate measures, we build on recent work on automatic or "implicit" forms of attitude. It is now well-understood that many forms of bias are not accessible to introspective access (e.g., Greenwald & Banaji, 1995), taking the form of lower level semantic associations, such as positive associations with ingroups, which then exert downstream pressure on a wide range of intergroup behaviors (e.g., Greenwald, Poehlman, Uhlmann, & Banaji, 2009). Taking this insight seriously requires supplementing self-report measures with attempts to measure the implicit constructs, an approach still relatively rare in developmental research (see Olson & Dunham, 2010, for a review). In this study, we contribute a new measure that is suitable for children younger than have previously been investigated.

Second, fitting with this issue's focus on social exclusion, we sought to move beyond simple measures of preference by attempting to document how group-centered biases influence other aspects of intergroup functioning. Here we ask whether group membership affects how children interpret otherwise ambiguous intergroup interactions. Social psychologists have long pointed out that ambiguity is a likely place for bias to intrude. For example, in a now classic study, Duncan (1976) showed that White Americans were more likely to judge otherwise identical scenes involving one person bumping into another as hostile when the "bumper" was African America and the "bumpee" was White American. Thus, despite situational constancy, different social targets were judged in quite different ways.

Do these sorts of interpretive biases extend to the minimal social groups employed here? This question is important because ambiguous interactions between groups are commonplace; if children interpret ingroup and outgroup members differently in such situations, they would in essence be creating subjectively compelling but entirely illusory "evidence" in favor of the superiority of the ingroup ("they've behaved more positively!"). This could adversely affect potentially ameliorative processes such as intergroup cooperation (e.g., Chizhik, Shelly, & Toryer, 2009), and could provide the motivation and justification for systematic exclusion of outgroup members.

In summary, we investigated the developmental emergence of the preference for minimal ingroups and examine whether it is characterized by ingroup positivity, outgroup negativity, or both, using a self-report, an implicit, and an interpretive measure of intergroup bias. Experiment 1 focuses on 6-year olds, developing and validating a novel implicit measure and establishing the general procedure that will be adapted for use with younger children in Experiment 2.

## Experiment 1

### *Methods*

*Participants.* Thirty-seven 6-year olds (mean age = 6.2 [$SD$ = .6], girls = 21) of diverse racial-ethnic background (16 Hispanic, 15 White, and 6 other) were recruited from an elementary school in central California. Parental consent was secured in advance of all testing, and children provided verbal assent prior to beginning the procedure.

*Procedures.* Participants were tested alone in a small testing room by one of the two authors. Children were randomly assigned to either a green or orange group by drawing a colored token from a bag, were told that this indicated their group membership, and were then given a green or orange shirt to make membership salient. Children were then seated in front of a laptop computer and completed the measures described in the next section. At the completion of the study, as a manipulation check, children were asked which group they belonged to; all children successfully answered this question.

*Measures.* Children completed the following measures in counterbalanced order.

*The affect misattribution procedure (AMP).* In the AMP (Payne et al., 2005), participants are asked to make dichotomous good/bad judgments regarding the meaning of unfamiliar Chinese characters. Each character is preceded by a supraliminal prime image, which participants are led to believe is a prompt indicating the next trial is about to begin. The logic of the task is that if the prime

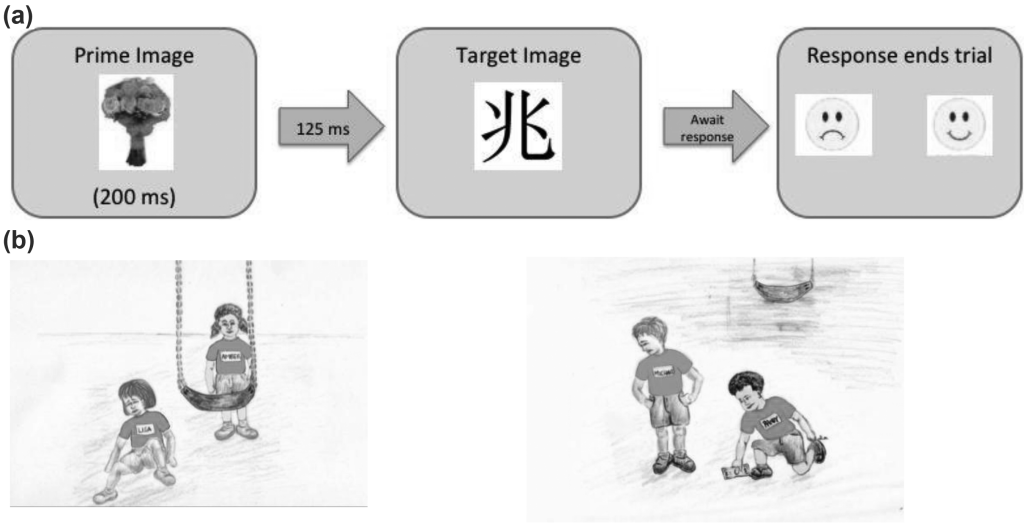


**Fig. 1.** (a) A schematic illustration of the insect–flower AMP. In the AMP, a prime is briefly flashed on the screen, followed by a short intertrial interval, followed by a Chinese character. Participants are asked to ignore the initial image and evaluate the target stimulus as positive or negative by pressing a key; their response ends the trial. (b) Example ambiguous situations, adapted from McGlothlin et al., 2005. Left scenario is an example of (girls, orange perpetrator), right scenario an example of (boys, green perpetrator).

images are automatically evaluated, i.e., if they automatically activate positive or negative affect, that affect will be misattributed to the valence-ambiguous Chinese characters, biasing judgments of them in the corresponding direction. In other words, valence aroused by the supraliminal prime will be "misattributed" to intuitive responses to the Chinese character, resulting in judgments that tend to match the valence of the prime image. In adults, this operates outside of conscious awareness and control, in that even participants explicitly asked to avoid the influence of the prime nonetheless show the same effect at the same magnitude (Payne et al., 2005). Thus, this measure satisfied commonly identified criteria for automatic or implicit cognition (e.g., Bargh, 1994). In our child-friendly version of the task, color photographs of prime images appeared on screen for 250 ms, followed by a 125-ms intertrial interval and then an unfamiliar Chinese character which remained on the screen until the child responded by verbally making a good or bad judgment. A schematic depiction of the task is presented in Figure 1(a). To validate this new measure for use with children, in addition to intergroup preferences, we also included an initial block of trials assessing preference for flowers over insects. Prior research has established that children of this age prefer flowers to insects when assessed at the implicit level (Baron & Banaji, 2006), we had a priori reason to anticipate that same result with the AMP. In the insect–flower version of the task, photographs of insects, flowers, and gray squares (serving as neutral primes) were employed as primes, randomly presented over 30 trials. In a second block, constituting the minimal groups version of the task,

prime images were full color head and torso photographs of ingroup members or outgroup members (indicated by t-shirt color), or gray squares, randomly presented over 48 trials. Results thus turn on whether the different types of prime image differently affect the subsequent interpretation of the valence of unfamiliar Chinese characters.

Prior research on implicit attitudes in children has almost exclusively employed the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), which relies on reaction time, task switching, and other forms of response inhibition. The substantial developments in these faculties during the preschool years (Davidson, Amso, Anderson, & Diamond, 2006) led us to doubt its appropriateness with young children. By contrast, the AMP does not rely on reaction time or task switching. In addition, unlike the IAT, which is essentially a relative measure of preference, the AMP allows independent assessments of ingroup positivity and outgroup negativity, which may differently develop in young children (Aboud, 2003).

*Ambiguous situations task (AST).* We modified a task previously used to investigate racial attitudes (McGlothlin & Killen, 2006; McGlothlin, Killen, & Edmonds, 2005). The task involves four scenarios depicting dyadic interactions designed to be ambiguous with respect to the nature of the interaction, with one child in a potential "perpetrator" role and the other in a potential "victim" role (children were gender-matched to the participant). For example, a child has fallen down in front of a swing, with another child standing behind the swing (Figure 1b). Did the child fall, or was she pushed by the standing child? Our version of the task, the two members of each dyad differed solely on t-shirt color, and perpetrator roles were counterbalanced across participants. Two scenarios involved an ingroup and two an outgroup perpetrator. Children were asked what happened in the picture, and what the potential perpetrator did, and their free responses were recorded for subsequent coding. Because these scenarios were made with the intention of implying potential negative behaviors (i.e., identifying perpetrators), we followed prior work with the procedure (McGlothlin et al., 2005) by basing our analysis on children's interpretations of actions as negative or neutral/positive. Approximately 50% of responses were independently coded by a graduate student rater blind to condition. Interrater reliability was high, Cohen's Kappa = .83, suggesting that children's responses were clearly interpretable.

*Explicit attitude measure.* To facilitate comparison with prior research, we included a self-report measure of attitude, in which photographs of six children, three from the child's ingroup and three from the child's outgroup, were presented sequentially. These were the same photographs used as primes in the AMP, though the pairing of children to group was counterbalanced as a between-participants factor. Children were asked to indicate their liking for each child on a 6-point scale pictorially represented as a range of faces going from a large frown to a large smile, and responses were averaged to produce an index of preference.

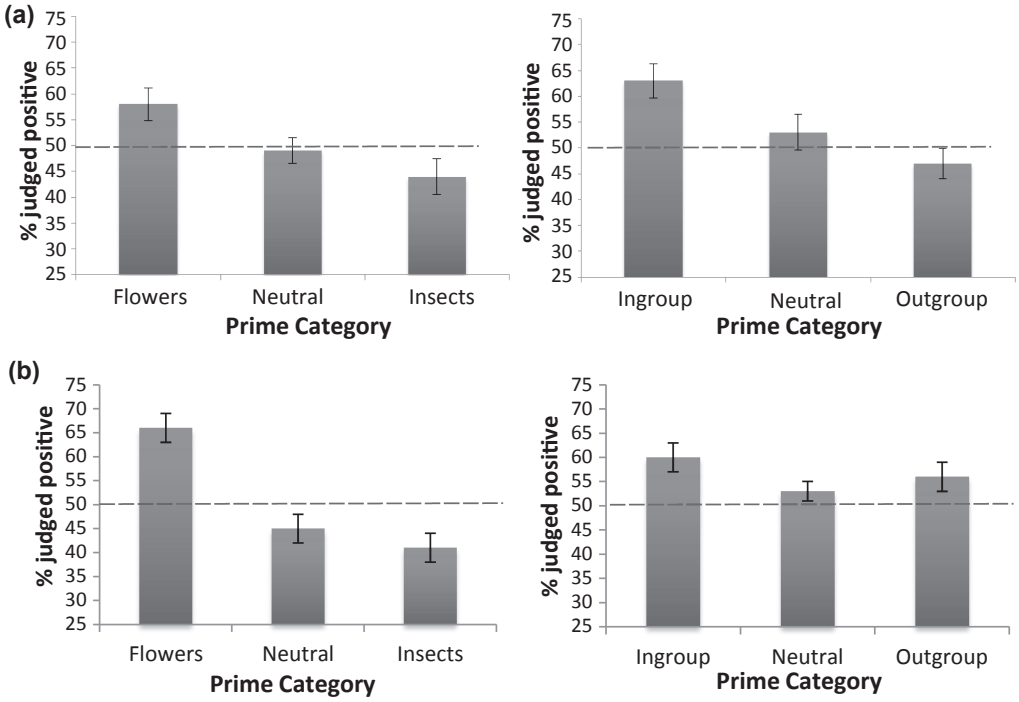


**Fig. 2.** (a) Interpretations of unfamiliar Chinese characters following priming with insects, flowers, and neutral gray squares (left panel) and ingroup faces, outgroup faces, and neutral gray squares (right panel) for 6-year-old children in Experiment 1. Error bars represent standard errors of the means; chance responding = 50%. (b) Interpretations of unfamiliar Chinese characters following priming with insects, flowers, and neutral gray squares (left panel) and ingroup faces, outgroup faces, and neutral gray squares (right panel) for 3–4-year-old children in Experiment 2. Error bars represent standard errors of the means; chance responding = 50%.

## Results and Discussion

No differences were observed with respect to participant gender, race/ethnicity, or color of the group, so these factors were dropped from subsequent analyses.

### *The AMP*

We begin with the insect–flower version of the task (Figure 2, panel a). On average, children interpreted 58% ($SD$ = 19%) of characters as positive when they followed pictures of flowers, which differed from chance responding, $t(36) = 2.65$, $p = .011$; participants interpreted 49% ($SD$ = 15%) as positive when they followed gray squares, which did not differ from chance, $t(36) = -.47$, $p = .64$; finally, participants interpreted only 44% ($SD$ = 21%) as positive when they followed insects, which was marginally below chance, $t(36) = -1.79$, $p = .092$. These differences were compared in an ANOVA predicting the percentage

of positive responses from prime type, revealing a significant main effect of prime type, $F(2, 35) = 3.42$, $p = .044$. Planned contrasts revealed that responses following flower primes differed from responses following insect primes and neutral primes, both paired $t(36) > 2.1$, $p < .04$, insect–flower comparison $d = .44$, but responses to negative and neutral primes did not differ, paired $t(36) = 1.18$, $p = .25$. This pattern of results demonstrates that implicit preference for flowers over insects is driven primarily by positivity associated with flowers, but negativity associated with insects likely also contributes, given the deviation from chance responding for insect stimuli. Crucially, by replicating prior research with a different measure showing implicit flower over insect preference (Baron & Banaji, 2006), we demonstrate that the AMP yields interpretable results with children of this age.

Turning to the minimal groups AMP (Figure 2, panel a), on average, participants interpreted 63% ($SD = 18\%$) of words as positive following pictures of ingroup members, which differed from chance performance, $t(36) = 4.28$, $p < .001$; participants interpreted 53% ($SD = 20\%$) as positive following gray squares, and 47% ($SD = 19\%$) as positive following outgroup members, neither of which deviated from chance, both $t(36) < 1.1$, $p > .29$. We again compared these figures in an ANOVA, revealing a main effect of prime type, $F(2, 35 = 5.07)$, $p = .012$, indicating that valence judgments were affected by prime category. Planned contrasts revealed that this effect was driven by an increased rate of positive responses following ingroup primes, which differed from outgroup primes, paired $t(36) = 3.22$, $p = .003$, $d = .53$, as well as neutral primes, paired $t(36) = 1.99$, $p = .054$. Neutral primes and outgroup primes did not yield differential effects, paired $t(36) = 1.61$, $p = .12$. Thus, the AMP revealed implicit positivity associated with members of the novel ingroup, but no negativity associated with members of the outgroup (for related findings with early race preferences, see Aboud, 2003; cf. Brewer, 1999).

*Ambiguous Situations Task*

Preliminary analyses indicated that rates of negative interpretation differed significantly depending on scenario. To capture this variation while also respecting the repeated measures aspect of the data (multiple trials per participant), data were analyzed via mixed logistic regression (trials nested within participants), predicting the probability of positive or negative judgments from prime valence and/or perpetrator group (ingroup or outgroup), and scenario. Effect sizes are odds ratios indicting the increased likelihood of favoring the ingroup.

Our analysis thus focused on whether the rate of negative interpretations differed depending on the perpetrator's group. Overall, participants made negative interpretations in 58% of scenarios, but this varied as a function of target group membership (51% for the ingroup, 64% for the outgroup), $F(1, 107) = 4.79$,

$p = .03$, with participants 2.2 times more likely to make a negative interpretation of a protagonist's behavior when that protagonist was a member of the outgroup than the ingroup (conventionally a medium effect). Thus, the interpretive bias previously observed in the context of race bias (McGlothlin & Killen, 2006) can also be observed with randomly assigned and previously unfamiliar minimal groups.

### *Explicit Attitude Measure*

The dependent measure was a difference score representing the degree to which ingroup members were rated higher than outgroup members. While trending toward ingroup preference, this value did not approach significance, $M_{diff} = .23$ (1.5), $t(36) = .91$, $p = .37$, $d = .15$. Thus, participants did not report a preference for their ingroup. Examination of means in comparison to the scale midpoint (3.5 on the 6-point scale) revealed that both the outgroup ($M = 4.2$, $SD = 1.4$) and the ingroup ($M = 4.4$, $SD = 1.2$) were positively evaluated, both $t(36) > 3.04$, $p < .005$. Thus, children self-reported liking for all children, irrespective of group membership. Given that our photographs were of smiling, attractive same-gender age-mates, this is perhaps not unsurprising; we return to this issue in the general discussion.

### *Relationships between Measures*

We examined correlations between the AST, the AMP, and self-report attitude. Only one correlation reached significance, between ingroup preference on the AMP and explicit preference, $r(36) = .35$, $p = .03$; others $|r/(36) < .14$, $p > .43$. This finding indicates that, despite finding no main effect of group membership on the self-report measure, self-reported attitudes were reliably related to the larger effects we found on the priming-based AMP.

In sum, Experiment 1 indicates that random assignment to arbitrary social groups produces a highly generalized form of ingroup preference in 6-year olds, such that mere exposure to members of the ingroup activates positive valence. In addition, ingroup members are less likely to be interpreted as engaging in negative actions, suggesting that initial biases could have downstream consequences by affecting how group-relevant information is internalized. At first glance this result might be simply be interpreted as an indirect measure of attitude, this interpretive bias plausibly goes further, furnishing subjectively compelling "evidence" in favor of the superiority of the ingroup. That is, if children believe that their experience provides direct evidence that ingroup members have behaved better, they are likely to believe that their biases are justified. More broadly, these findings support the claim that, by age 6, children are predisposed evaluate ingroup members more

positively than outgroup members, though this tendency is less reliable when assessed through self-report.

## Experiment 2

Experiment 1 provided evidence of a highly general tendency to positively evaluate arbitrary social groups in 6-year olds. We interpret this as evidence that, by this age, children are predisposed to focus on social distinctions, and attach evaluative weight to such distinctions. Given that younger children seem more restrictive in the preferences they show, for example failing to reliably show race-based preferences until sometime around age 3–4, we speculated that minimal group preferences would be weaker in younger children.

### *Methods*

*Participants.* Fifty 3–4-year olds participated in Study 2 (mean age = 3.9 years ($SD$ = .7 years), female = 35). Though predominately White and middle class, the sample included children from diverse racial and ethnic backgrounds (32 White, 3 Hispanic, 3 Black, 5 South Asian, and 7 other), and were recruited from local preschools in California and New Jersey.

### *Procedures and measures*

*Affect misattribution procedure.* To accommodate the shorter attention spans of younger children, we decreased the number of trials to 30 in the minimal groups block (from 48).

*Ambiguous situations task.* Because we were concerned that the verbal demands of this task might be too great for younger children, we included a prompt after soliciting free responses by indicating the potential perpetrator and asking "do you think [name] did something nice or mean?" and recording children's responses. Of course, this change reduces the possibility that children will provide neutral responses, as they are prompted for a single valenced response. Except for this variant, the task was identical to that described in Experiment 1.

As a manipulation check, at the completion of the study children were asked which group they belonged to; only one child failed to answer this question correctly.

## Results and Discussion

No differences were observed with respect to participant gender, race/ethnicity, or color of the ingroup, so these factors were dropped from subsequent analyses. One participant was eliminated for failing to follow instructions

and one participant asked to stop the procedure prior to completing the minimal groups AMP; in addition, AMP data from participants who made solely positive or negative responses on all trials was eliminated, resulting in a usable sample of 45 participants for the Insect–Flower AMP, 42 participants from the minimal group AMP, and 47 participants for the AST.

*The AMP*

Beginning with the insect–flower version of the task (Figure 2, panel b), on average children interpreted 66% ($SD = 18\%$) of characters as positive when they followed pictures of flowers, which differed from chance expectations, $t(44) = 5.66$, $p < .001$; 45% ($SD = 22\%$) when they followed gray squares, which did not differ from chance, $t(45) = -1.49$, $p = .14$, and 41% ($SD = 20\%$) when they followed insects, which was reliably below chance, $t(45) = -3.25$, $p = .002$. Comparing these values via ANOVA revealed an effect of prime type, $F(2, 43 = 19.85)$, $p < .001$, indicating that responses varied as a function of prime. Planned comparisons revealed that responses following flowers were reliably different from both responses following neutral primes and insects, both paired $t(44) > 5.1$, $p < .001$, insect–flower comparison $d = .74$. However, negative and neutral primes did not significantly differ, paired $t(44) = 1.35$, $p = .19$. This pattern of results is identical to that revealed with older children in Experiment 1. Thus, younger children showed the same effects as older children in Experiment 1, responding more positively following flowers than insects. This replication with younger children provides evidence of the suitability of the AMP for children in this age range.

A different pattern emerged on the minimal groups AMP (Figure 2, panel b). The mean percentage of positive interpretations following ingroup primes was 60% ($SD = 18\%$), which differed from chance expectations, $t(41) = 3.54$, $p = .001$; positive interpretations following outgroup primes were 56% ($SD = 22\%$), which was also marginally above chance, $t(41) = 1.92$, $p = .062$; the mean percentage following neutral primes hovered around chance (53%, $SD = 16\%$), which did not differ from chance, $t(41) = 1.31$, $p = .20$. Turning to the ANOVA used to compare these figures, the analysis revealed no effect of prime type, $F(2, 40) = 2.33$, $p = .11$, thus, the rate of responding following ingroup, outgroup, and neutral primes did not differ. The primary divergence from prior findings is the trend toward more positive responses following both ingroup and outgroup primes, suggesting that for younger children, pictures of smiling children were positive irrespective of group membership. To test this possibility more formally, we collapsed across the dimension of group membership and analyzed responses following children as compared with neutral gray squares. While suggesting a small effect, $d = .27$, the results were of only marginal significance, $F(1, 41) = 3.07$, $p = .087$, but can cautiously be interpreted as showing that, for children of

this age, smiling, same-gender age-mates served as positive primes irrespective of group membership.

*Ambiguous situations task*

We fit the same model described in Experiment 1, but the main effect of protagonist group was not significant, $F(1, 137) = 1.65$, $p = .20$; thus, rates of negative interpretation did not differ as a function of whether the target was in the ingroup or the outgroup. Unlike with the older children in Experiment 1, younger children's interpretations of ambiguous events were not affected by the membership of the individuals involved.

*Explicit attitude measure*

There was no evidence of explicit preference for the ingroup, $M = -.06$ ($SD = 1.5$), $t(49) = -.30$, $p = .77$. Both the outgroup ($M = 4.1$, $SD = 1.2$) and the ingroup ($M = 4.2$, $SD = 1.2$) were evaluated above the scale midpoint (3.5), $t$s(49) $> 3.7$, $p$s $< .001$.

*Relationships between measures*

The correlation between the AMP and the self-report measure was of marginal significance, $r(42) = .27$, $p = .087$; no other correlations approached significance, both $r > -.12$, $p > .27$. It is interesting that the one significant correlation in Experiment 1, between the AMP and self-report attitude, was the strongest correlation here; this suggests that even at this young age, some children may be beginning to orient toward their minimal groups, and this is registering on both self-report and implicit measures.

Overall, Experiment 2 suggests that 3–4-year-old children do not rapidly form ingroup preference with respect to novel social distinctions, despite encoding their group membership (all children but one successfully recalled their group membership). While there was the barest hint of group-based preference (in that children were most positively primed by ingroup faces), this difference was not statistically reliable, and a more parsimonious interpretation is that they are responding positively to smiling children's faces with little additional influence from group membership. It is possible that group members with neutral expressions would elicit clearer evidence of group-based priming, but this possibility indirectly supports our hypothesized individual to sociocentric shift, in that smiling faces, a canonical individual-level feature, were pervasively impactful in younger children, while a few years later smiling outgroup faces no longer served as positive primes. Thus, by age 6 individuals are not just individuals; they are also members of social groups, with clear evaluative consequences. Though differences in the

task, e.g., the number of trials, make it necessary to interpret across-study comparisons with some caution, in a supplementary analysis we compared results on the AMP across the two studies in a single ANOVA predicting positive responses as a function of age and prime type. This analysis revealed a main effect of prime type, $F(2, 76) = 6.67$, $p = .002$, indicating that ingroup primes elicited more positive responses than outgroup primes, no overall effect of age, $F(1, 77) = 0.45$, $p = .51$, and a marginal interaction between age and prime type, $F(2, 76) = 2.72$, $p = .07$, suggesting that the effect of prime type differed by age. Post hoc contrasts indicated that this interaction was driven by responses to outgroup primes, which were significantly less positive in older than younger children, $t(77) = 1.98$, $p = .05$ (ingroup and neutral primes both $p$s $> .49$). This supports the contention of an age-related shift such that smiling outgroup children cease to serve as positive primes over the age range investigated.

## General Discussion

By age 6, mere exposure to photographs of arbitrarily assigned ingroup members is sufficient to arouse positive affect, which can then be misattributed to other unfamiliar ambiguous stimuli. In addition, children of this age interpret outgroup members more negatively when viewing intergroup interactions in which they figure. Given that children did not report preference for these same ingroup members, these biases appear to operate largely outside of conscious awareness, suggesting that they are best considered part of an implicit or automatic evaluative system. This dissociation also militates against the worry that children were directly evaluating the prime images during the AMP; if so, we would have expected high concordance between the AMP and the self-report task that involved evaluating those same stimuli. Some prior research (e.g., Dunham et al., 2011) does report ingroup preference on self-report measures; we do not have a clear explanation for this discrepancy, but do note that even in that prior work the effect size was small, considerably smaller than when bias was measured implicitly. This is intriguing, as it suggests that the implicit form of intergroup bias is stronger—or at least earlier emerging—than the explicit form. Given that the implicit measure we employed here, evaluative priming, implicates a highly general cognitive process, it could underlie the emergence of entrenched intergroup biases.

However, the present data also provide evidence that these cognitive phenomena do not emerge until sometime after age 3. We have some concerns about whether the AST was too difficult for children, potentially leading to the null result with that measure, but this cannot wholly explain our findings. In particular, younger children were perfectly susceptible to affective priming more generally, given the results of the insect–flower portion of the study. In addition, other work demonstrates that children of this age are sensitive to similarities of the sort used to define groups in this work. For example, 3-year olds do use similarity to guide

preference for individuals, preferring individuals with whom they share a food preference or who are similar along some visual dimensions such as hair color (Fawcett & Markson, 2010). This suggests that the cognitive components necessary to identify and affiliate with ingroups are in place. Indeed, despite showing no preference for their ingroup, 3-year olds did encode their group membership, as shown by the fact that they readily recalled their membership at the conclusion of the study.

We suggest that the decisive shift involves the expansion of habitual modes of social reasoning from individuals to collectives. This period has been characterized as "sociocentric" (Aboud, 1988), and is associated with increasing self-reported preference for a wide range of ingroups (Raabe & Beelmann, 2011). In simplest terms, having acquired substantial familiarity with the individuals in their immediate social circle, children are becoming increasingly aware of the myriad ways in which those individuals cluster into groups. Because these distinctions are so varied (e.g., based on biological phenotypes, shared beliefs, ethnic markings, invisible facts in the causal history of the individual), children at this stage may choose to be promiscuously group-focused, attaching meaning to any group distinction that is explicitly provided for them. Of course, some groups, namely those that are culturally reinforced, will gradually rise in importance and come to be more habitual modes of social perception. But it remains the case that children are sensitive to even quite minimal markers of group differentiation and that their attitudes toward them as well as their experiences of affiliation and rejection (Nesdale, Zimmer-Gembeck, & Roxburgh, 2014) shape their emerging intergroup social cognition.

Children do manifest preferences for a few social groups, namely gender, age, and language, several years before this putative sociocentric shift. Whereas it has been argued that some or all of these three categories might be supported by innate acquisition mechanisms (e.g., Kinzler, Shutts, & Correll, 2010), it seems equally plausible that these categories emerge first because they are the most salient and relevant to young children. Language is vital to communication and the internalization of cultural knowledge; adults repeatedly mark, and remark upon, gender; age often rigidly demarcates the world of the child from the world of the adult. In short, our argument is not that younger children are incapable of sociocentric reasoning, but rather that they only draw upon it when the categories in question pass a threshold of salience and relevance (for suggestions of what factors might matter, see Bigler & Liben, 2007). The current findings suggest that the threshold for treating a category relevant undergoes a pronounced shift between ages 3 and 6, with older children prepared to accept a category as socially meaningful with only the barest of evidence, namely their membership in it.

We acknowledge several limitations of this study. Most notably, it suffers from the general limitations associated with interpreting negative evidence: just because young children failed to manifest preferences for shirt-based minimal

groups on the measures employed here, it would be premature to conclude that younger children are unable to form affiliations with novel groups (of other sorts, on other measures), for example if additional evidence suggested that a social distinction was meaningful. Nonetheless, negative evidence is informative when it illuminates a boundary condition not present in other contexts, in this case preferences of other sorts on the same measure (i.e., insects vs. flowers) and preferences of the same sort in older children. In the current context, for older children and adults, essentially any social distinction is sufficient to produce robust ingroup preferences; not so for their younger counterparts, who appear to require more direct evidence of the category's utility (e.g., Patterson & Bigler, 2006). Of course, a variety of cognitive, social, and developmental changes occur between the ages of 3 and 6 years. It is likely that multiple factors contribute to the increase in affiliation with ingroups evident in our results. Future work should begin to more fully explore what developmental shifts drive an increase in social group affiliation during these years.

*Group Affiliation as a Social Issue*

The findings reported here suggest that "mere membership" in a previously unfamiliar "minimal" social group is sufficient to bias interpretations of behavior among children as young as 6 years old. Simply put, by this age children are more likely to grant ingroup members the benefit of the doubt when presented with the possibility that an ingroup member was engaged in wrongdoing, and are more likely to ascribe blame to an outgroup member in the very same situation. These findings suggest that similar tendencies observed in adults have a long developmental history, and indeed, could grow stronger over developmental time as children form richer representations of groups that are themselves influenced by these biases. It is important to note that these biases bear a striking similarity to well-known social problems such as social profiling and disparities in criminal penalties, in which one element of the problem is the cloud of increased suspicion that hangs over members of some stigmatized social categories. The fact that these discriminatory tendencies emerge most pervasively at the automatic or implicit level poses an additional problem, because it suggests that they can occur despite our best intentions. A crucial problem for future research therefore concerns the steps that can be taken to reduce or eliminate the forms of intergroup bias described here, and ideally to circumvent their formation in childhood.

In closing, our guiding assumption is that understanding the basic cognitive processes underlying intergroup reasoning will ultimately contribute to efforts to positively intervene on the lives of children. Our findings suggest that over the late preschool years children begin to more reflexively affiliate with social groups, and that this could drive increasing attention to group differences. More importantly, the perception of those differences is itself biased in ingroup-favoring

ways, arming children with persuasive but ultimately unfounded beliefs about the superiority of the ingroup. These beliefs are plausible inputs into the decision processes which culminate in social exclusion, discrimination, and prejudice.

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YARROW DUNHAM is trained in cognitive development and social cognition, and focuses on intergroup social processes across the lifespan. After completing his doctorate at Harvard University, he was an assistant professor at the University of California, Merced, and a Research Scholar at Princeton University. He is currently an assistant professor of psychology and cognitive science at Yale University.

JASON EMORY is an advanced graduate student in social and health psychology at the University of California, Merced. He is interested in the social psychology of intergroup relations and applications of social psychology to public health campaigns.