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Preschoolers Use Social Allegiances to Predict Behavior

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Abstract

Developing mechanisms for predicting human action is a critical task of early conceptual development. Three studies examined whether four-year-old children (N = 149) use social allegiances to predict behavior, by testing whether they expect the experiences of social partners to influence individual action. After being exposed to a conflict between two individuals from different novel social categories, children reliably predicted that another member of one category would withhold friendship from the contrasting category (Studies 1-2) and direct harmful actions towards the contrasting category (Study 3). Children did so even when the initial conflict had no direct implications for the other category members, and even when they knew that the two social categories had a positive relationship in the past. These data show that young children view social categories as marking people who are obligated to one another, and thus use the experiences of allegiance partners to predict how individuals will behave.

Keywords: Social categories, Naïve theories, Social cognition

Preschoolers Use Social Allegiances to Predict Behavior

In *Romeo and Juliet*, the central events of the story are set in motion when Tybalt, a Capulet, kills Mercutio, a Montague. This incident leads Romeo, another Montague, to kill Tybalt in return. This series of events can be understood—and even predicted—if we (a) know that Mercutio and Romeo are friends and allies, (b) expect social partners to be influenced by each other's experiences, and thus (c) infer that because of Tybalt's actions towards Mercutio and Mercutio's alliance with Romeo, Romeo will now aggress towards Tybalt.

This example illustrates that tracking social relationships and monitoring the experiences of social partners are important strategies for predicting future behavior. Indeed, just these types of inferences underlie the subsequent actions of the Prince of Verona, who banishes Romeo. The prince explains this decision by indicating that if he does not take drastic action, a dangerous cycle of violence will continue as members of the two competing alliances endlessly retaliate against one another. Consistent with the prince's intuitions, behavioral patterns fitting this description—in which social partners act on each other's behalf and thus spread conflict across a social network—are plentiful in experimental social psychology research (Batson, 1998), as well as in observational and sociological studies (e.g., of patterns of schoolyard bullying, Hodges, Boivin, Vitaro, Bukowski, 1999; of aggression in non-human primates, Cheney & Seyfarth, 1986, 1999; and of the spreading of violence across urban gangs, Papachristos, 2009).

The goal of the present research is to examine the developmental origins of this component of social cognition—the use of experiences of allegiance-partners to predict how individuals will behave in the future. In the present studies, children were introduced to social allegiances that were marked by membership in novel social categories. We test whether and

how children use the experiences of individual category members to predict subsequent relationships and interactions among other category members.

For children to predict that individual experiences will influence the subsequent behavior of category members, an important prerequisite is that they view category memberships themselves as important predictors of behavior. Indeed, by quite early in childhood, children attribute causal power to membership in social categories. For example, toddlers and preschool-age children apply stereotypes about social categories to new individuals; they assume that an unfamiliar girl will like dolls, for example, even if they have very little information about her as an individual (Martin & Ruble, 2010). In fact, preschool-age children often rely on stereotypes about social categories more rigidly than adults do, continuing to make stereotype-based predictions even if they have contrasting individuating information (e.g., that the girl previously chose to play with trucks, Berndt & Heller, 1986; that the girl generally prefers to play outside, Biernat, 1991; or that the girl has grown up in a community of all boys, Taylor, 1996; Taylor, Rhodes, & Gelman, 2009).

Children's use of categories to predict individual behavior does not reflect the simple extension of observed regularities (e.g., prior observations that girls often play with dolls), but rather more abstract beliefs that categories mark individuals that are fundamentally similar to each other in many known and yet-to-be-discovered ways. Thus, preschool-age children use category information as an inductive base to make a range of physical, behavioral, and psychological predictions even when they have very little information about or experience with the individual properties. For example, upon learning that one girl likes a novel game (Diesendruck & haLevi, 2006) or has a previously unfamiliar physical property (Gelman, Collman, & Maccoby, 1986), children age four and older will predict that other girls will have

those properties too, based on only a single piece of evidence (Waxman, 2010). Children use a range of social categories (e.g., gender, race, ethnicity, religion) to make these kinds of predictions, although the particular categories they use depends on the salience and relevance of various categories in their cultural context (Birnbaum, Deeb, Segall, Ben-Eliyahu, & Diesendruck, 2010; Deeb, Segall, Birnbaum, Ben-Eliyahu, & Diesendruck, 2011; Rhodes & Gelman, 2009). Thus, children treat some social categories as marking people that are fundamentally similar to each other, much like they treat species categories as marking animals that are fundamentally similar to each other (Gelman & Markman, 1986; Rhodes & Gelman, 2009; Taylor et al., 2009). Consequently, such categories enable inductive inferences by facilitating the extension of information about one category member to other members of the kind.

The form of category-based reasoning examined in the present research, however—use of the experiences of individuals to predict the behavior of other category members—may reflect an additional type of category-based inference. For example, the prince's inferences in the example above rely not on an assumption of fundamental similarity among the Montagues, but on an abstract understanding of the obligations that accompany social allegiances. In other words, the Prince took the social allegiance between Romeo and Mercutio as obligating them to act on each other's behalf. This example suggests that category memberships may serve an additional inferential role in social cognition: By marking who is obligated to one another, social groups can facilitate inferences about social interactions. Here, the causal power of groups comes not from the fundamental similarity of group members to one another, but from the patterns of social relationships and obligations that group memberships are taken to reflect.

Preschool-age children do indeed treat social group memberships as marking characteristic patterns of social relationships and social interactions. For example, preschoolers predict that individuals who share membership in a social category (e.g., are both girls, are both white) will be friends with each other (Shutts, Roben, & Spelke, in press). They also use social categories to guide their own friendship choices in experimental contexts, preferring to be friends with people who match them in gender, race, age, and linguistic background (Finkelstein & Haskins, 1983; French, 1987; Kats & Kofkin, 1997; Kinzler, Shutts, Dejesus, & Spelke, 2009; Kowalski & Lo, 2001; Maccoby & Jacklin, 1987; Martin, Fabes, Evans, & Wyman, 1999).

Children even appear to have expectations that categories mark certain patterns of social relationships for categories with which they have no experience. For example, Rhodes (in press) documented that preschool-age children have abstract, generalized expectations about how group memberships shape social interactions, at least to make predictions about a limited set of social behaviors. In this work, children age 3 and older used novel social groups, of which they themselves did not hold membership, to make predictions about patterns of harmful social interactions. That is, children reliably predicted that an agent from one novel group would direct a harmful action (e.g., stealing a cookie) towards a member of the contrasting novel group, instead of towards a member of the agent's own group. Because the social groups were novel and children had very little information about them, children could not simply apply previously observed regularities (e.g., observations of members of the groups interacting positively or negatively) to answer these questions. Also, because the children were not themselves members of these groups, they could not rely on basic preferences for their own group members (Dunham, Baron, & Carey, 2011) to guide their responses. Instead, to respond systematically to these items,

children had to rely on abstract expectations about how group memberships constrain and predict patterns of social interaction—or a "naïve theory" of social groups.

Children's naïve theories of social groups have important implications for social cognition. If children do indeed have abstract expectations about the role of social categories in shaping how individuals relate to one another, then they should use such categories not only to predict patterns of individual behavior, but also to understand patterns of social obligation more generally. In particular, if children have an intuitive theory that social categories mark people who are fundamentally obligated to protect one another, then they could use this theory to predict that group members will not only avoid within-group harm, but will react negatively to transgressions committed against fellow group members.

The present studies test this possibility by examining children's inferences about how the social experiences of individual category members affect the subsequent behavior of other members of the group. Thus, instead of asking whether preschoolers expect categories to mark patterns of general group relations, we test how preschoolers expect group interactions to *change* following the experiences of individual group members. For example, if children view members of a group as obligated to protect one another, then they should expect a social conflict involving one group member to cause other members of the group to behave protectively in future interactions—thus spreading the conflict across the group. For this process to occur, children would have to integrate new evidence (the observation of individual experiences) with their naïve theory (that group members are obligated to one another) to make a novel prediction about other agents' behaviors.

Overview of Studies

Study 1 tests whether children predict that a conflict involving individual group members will influence the subsequent behavior of other group members, and compares the effects of conflict involving individuals to instances where there is no conflict at all and to instances where the entire groups are in a pre-existing state of conflict. Study 2 tests whether children expect negative interactions involving individuals to influence the subsequent behavior of other group members even when there is little chance that the original conflict could have directly influenced these other group members. Study 3 examines the processes underlying children's inferences in more detail. In particular, Study 3a tests whether children expect conflict between individuals to generalize to the group because they interpret the behavior as *reflecting* a state of on-going conflict or because they expect it to *cause* a subsequent state of new conflict. Study 3b tests whether children expect *any* type of interaction between group members to generalize to the group, or whether this pattern of inferences is selective to those that are consistent with their naïve theories of how groups mark patterns of social obligations.

These studies all focus on 4-year-old children. This age group is of theoretical significance for several reasons. First, by four years, children have just begun to use social categories to make explicit predictions about third party social relationships and social interactions (Rhodes, in press; Shutts et al., in press). Four-year-olds are also just beginning to show systematic affective biases based on their own novel group memberships (Dunham et al., 2011). Thus, testing whether children use the experiences of group members to predict individuals' future behaviors will reveal whether this is an early-developing component of social cognition—available to children around the same time that they show a range of other category-based processes. Alternately, use of social categories in the manner tested here could depend on more protracted experiences in social groups or more advanced perspective-taking skills and thus

develop later in childhood, along with children's more complex theories of group dynamics (Abrams & Rutland, 2008; Abrams, Rutland, Ferrell, & Pelletier, 2008, 2009).

Second, characterizing preschool social cognition has long been an important goal of research in developmental psychology. By the preschool years, children rely on naïve theories to appeal to a range of nonobvious causal mechanisms to predict human action, including beliefs and desires (Wellman, 2002), traits (Gelman & Heyman, 1999), and category memberships (Diesendruck & ha Levi, 2006; Kalish & Lawson, 2008; Rhodes, in press; Shutts, Banaji, & Spelke, 2010). Yet, despite early emerging sophistication in social cognition, children's naïve theories also often go through substantial revision across childhood (Diesendruck & haLevi, 2006; Taylor et al., 2009; Wellman, Cross, & Watson, 2001). Thus, examining preschool-age children's use of social partnerships to predict behavior is an important step towards fully characterizing features of continuity and discontinuity in social cognition across development.

Study 1

In Study 1, we introduced preschoolers to two novel groups of children (a red group and blue group) who were each engaged in within-group cooperative activities. In the focal condition, the relations between the groups were neutral (they were not engaged in competition), but children were told about a single negative interaction between individual group members. After this negative interaction, children were asked to predict whom another member of one of the groups—not involved in the conflict—would designate as her "friends." This condition was compared to a baseline condition in which the individual interaction and group relations were both neutral; if children expect the negative interaction between individuals in the focal condition to result in negative feelings and behaviors among other members of the groups, they should be more likely to predict that the target character will choose as friends only members of

her own group in the focal condition relative to the baseline condition. These two conditions were also compared to two conditions entailing conflict involving the entire groups, in the form of between-group competition. Thus, the full design was a 2 (Group Relations: Competitive, Non-competitive) X 2 (Individual Interaction: Negative, Neutral) factorial. The inclusion of the Group Relations factor served two purposes. First, these conditions allow for comparison of the effect of a negative individual interaction in the focal condition to the effect of a negative context involving the whole group. Second, these conditions allow for a test of the possibility that negative individual interactions affect other group members *only* when there is also a negative context between groups; or perhaps, whether the effects of individual interactions are accentuated under these circumstances.

Participants

Participants included 64 preschoolers (29 male, 36 female; *M* age = 4;8, range = 4;0-5;3 years; 75% European American, 3% Asian or Asian American, 2% Hispanic, 14% multi-ethnic, 6% unknown). Preschoolers were recruited via parent consent letters from preschools across New York City, and were tested individually by research assistants in quiet areas of the schools.

Procedures

The experimenter presented the participant with a picture of a child named "Annie" (see Appendix A) and played an audio recording of Annie speaking. First, children completed a warm-up activity to become familiar with the format of the dependent variable, which involved asking the child to distribute items on behalf of Annie, the target character. Through the audio recording, Annie said, "Hi there! I'm Annie! I have some things to give out, and I'd like you to help me." The experimenter then brought out a felt board that contained potential recipients of objects, which Annie asked the child to give out on her behalf. Children could give to the

recipients by affixing an object to a piece of Velcro underneath each possible recipient. Children completed two warm-up items to become familiar with this procedure. One warm-up item used dogs and cats as potential recipients, and the objects in question (dog bones) were only intended to be given to the dogs ("I have some dog bones! I want to give a bone to all the dogs. Let's give a bone to all the dogs!"). The other warm-up used monkeys of two different colors as potential recipients, and the objects in question (bananas) were intended to be given to all of the monkeys regardless of their color ("I have some bananas! I want to give a banana to all the monkeys. Let's give a banana to all the monkeys!"). The order of the warm-up items and the lateral position of the animals on the board were counterbalanced across participants. These two warm-ups were intended to help children understand how to give items out on Annie's behalf, and to communicate that it was acceptable to give to either all of the individuals on the board or to only some of the individuals on the board.

Following the warm-up, another board was brought out that contained pictures of eight children; four on one side wearing blue shirts and four on the other side wearing red shirts (see Appendix A). The picture of the target character, Annie, also wore either a blue or red shirt. Through the recording, Annie said, "I have some flowers! I want to give a flower to all of my friends. But first, I want to tell you what happened today. Here is the red team. And here is the blue team. I am on the red team." As "Annie" spoke, the experimenter pointed to the corresponding pictures to ensure that the child was focusing on the information provided.

Next, the story that was told (through the recording) varied by condition (full text of these stories and accompanying illustrations are available in Appendix A). First, to manipulate Group Relations, a tower-building activity was described, either competitively (i.e., "Today, we tried to build a really tall tower. We wanted to build our tower taller and faster than the blue team;"

referred to as Competitive Group Relations), or non-competitively ("Today, we tried to build a really tall tower. The red team built a tower and the blue team built a tower;" referred to as Non-competitive Group Relations).

Second, to manipulate the Individual Interaction, an interaction was described that occurred between two individuals (one from each group). This interaction either involved conflict (e.g., one member from each team went to get more blocks and they had a fight at the block pile; referred to as Negative Individual Interaction) or did not involve conflict (e.g., one member from each team went to get more blocks and they encountered each other at the block pile, but did not have a fight; referred to as Neutral Individual Interaction). The interaction was acted out for the child, by removing the individuals who participated in the interaction from the board, and moving them towards a pile of blocks. The individuals from each team were shown to have an equal role in starting and participating in "the fight", and there was no winner. Thus, the degree to which the individuals participating in the fight were portrayed as engaging in negative behaviors was equivalent across the individual from the target's own group and the individual from the other group. After the conflict, the individual from each team returned to their group. These interactions did not involve "Annie" or any other members of the groups; the group members who participated in these interactions are shown in Appendix A.

After the story, "Annie" continued, "Now here are the flowers! I want to give a flower to all of my friends." Children then distributed the flowers by fastening them to Velcro that was affixed underneath each of the eight children on the board. Children could give out flowers however they thought was appropriate (there were more than enough flowers to give to everyone), and no feedback was provided. After they designated "Annie's" friends (by giving out the flowers), children were asked to recall which characters had been involved in the

individual conflict, to ensure that they accurately understood and remembered the events of the story, and then to explain their strategy. Whether Annie was on the blue team or the red team and the lateral position of the teams on the board were counterbalanced across participants.

Coding

Friend Designation. Participants' distributions of flowers were taken as indications of their expectations about who Annie would consider to be her friends. Although participants could designate friends in any number of ways (e.g., they could give to two children from each team, to seven of the eight children, to only one child, and so on), the majority of participants (91% in Study 1, 97% in Study 2) used one of two strategies: they either designated all four children on Annie's team and no child from the other team (coded as "1"), or they designated all eight children (coded as "0"); analyses included only the participants who used one of these two strategies.

Explanations. Explanations were coded as "team" if participants referred to team membership to explain their responses (e.g., "Because Annie is on the blue team", "Because the red team wasn't on Annie's team"), "fairness" if they referred to "Annie's" desire to be fair or to reach out to the other team (e.g., "So it's equal and they don't fight about." "Because she wants them to feel better"), "psychological" if they referred to "Annie's" psychological state or simply stated who she was friends with (e.g., "because they were all friends" "Annie wanted to"), or as other/no response if children failed to respond or gave a response that was not code-able. Two independent raters coded all of the explanations (Cohen's Kappa = .86).

Results and Discussion

Responses were analyzed with binomial logistic regression models. Group Relations (GR) and Individual Interaction (II) were entered as fixed factors, and analyses tested for each

main effect and for a possible interaction. These analyses yield Wald χ^2 values as indicators of the significance of each predictor. Descriptive statistics are presented as the percentages of participants who designated only the target group as friends (see Figure 1), and Odds Ratios (OR) are presented as indicators of effects sizes. This analysis revealed a II*GR interaction, $\chi^2(1) = 3.75$, $p = .05$.

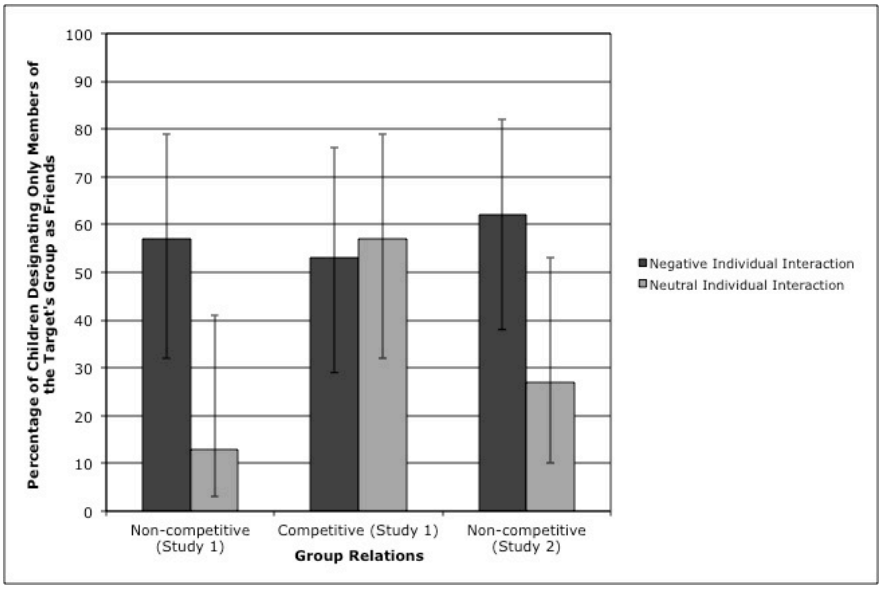


Figure 1. Percentages of children designating only members of the target's group as friends (Studies 1-2). Error bars represent 95% Wald Confidence Intervals.

As shown in Figure 1, when the Individual Interaction was neutral and Group Relations were non-competitive, preschoolers rarely designated only the target's group as friends (in this condition 87% of children responded that the target would be friends with everyone). Relative to this baseline condition, every other condition significantly increased the odds of predicting that the target character would be friends with only her own group (see Figure 1; II = Negative, GR = Non-competitive: $OR = 8.67$, $p = .04$; II = Neutral, GR = Competitive: $OR = 8.67$, $p = .04$; II = Negative, GR = Competitive: $OR = 7.43$, $p = .04$).

Children's explanations varied depending on whether they designated only the target's team as friends or everyone as friends, $\chi^2(3) = 9.05$, $p < .03$. Children who designated only the

target's team were more likely to refer to team membership to explain their responses (35% team, 4% fairness, 46% psychological, 15% other), whereas children who designated everyone were more likely to refer to fairness or psychological motives (6% team, 16% fairness, 66% psychological, 13% other).

In Study 1, when Group Relations were non-competitive and the Individual Interaction was neutral, preschoolers assumed that the target character would be friends with everyone. Describing either the Individual Interaction as negative or Group Relations as competitive (or both) increased the likelihood that participants would expect an individual to withhold friendship from members of the other group. Of particular interest is the focal condition, in which the Individual Interaction was negative but the Group Relations were non-competitive. Comparing this condition to the baseline condition demonstrates that preschoolers expected conflict between individuals to spread across the groups, even when there was no other evidence of tension between the groups. The effect of describing a Negative Individual Interaction was quite similar to describing Competitive Group Relations (or to describing both), suggesting that preschoolers consider both conflict between individuals and competition between groups as having similar negative consequences for future group relations.

Therefore, each condition that presented some form of conflict (either individual-level conflict, group-based competition, or both) substantially increased the odds that children would designate only the target's group members as her friends relative to the baseline condition. Yet, even in these conditions, only about half of children responded using this group-based strategy. Of critical interest here is that many *more* children did so in these conditions than in the baseline condition—when children were told only about neutral interactions, their default tendency was to assume that the target would be friends with everyone—even though this manipulation did not

affect all participants' responses. In future work, it would be useful to examine whether there are meaningful individual differences in preschool-age children's commitments to fairness, which could perhaps account for this variation. Alternately, this variation could be explained by individual differences in unrelated factors, such as children's attention to the story or events, comprehension of the test question instructions, and so on. Thus, in future work, it would be useful to test whether similar patterns of individual variation are found using other measures of preschoolers' inferences in these contexts.

Study 2

The aim of Study 2 was to provide additional evidence that preschoolers expect a conflict between individuals to spread across groups. A possible alternate interpretation of Study 1 is that preschoolers believed that the Negative Individual Interaction presented a direct threat to the target character ("Annie"). In Study 1, the entire team was described as working together to build a block tower; thus, perhaps children saw the events depicted during the Negative Individual Interaction as threatening the attainment of a goal in which "Annie" was directly involved (i.e. the goal of building the block tower). If so, then participants in Study 1 could have believed that "Annie" faced a direct negative consequence from the conflict (even though she was in no way involved in the conflict), leading her to withhold friendship from the other group. To evaluate this possibility, in Study 2, the two teams were not involved in within-group collaborative activities (i.e., building a tower together). Instead, every member of each team was engaged in his or her own independent activity.

Participants

Participants included 32 preschoolers (17 male, 15 female, 53% White, 9% multi-ethnic, 3% Asian, 6% Hispanic, 28% unknown; *M* age = 4;6, range = 4;0-5;3) recruited in the same manner as in Study 1.

Procedures

The experimental procedures were identical to Study 1, with the exception that each member of the team was described as engaged in an independent activity (instead of as working together). The recording of "Annie" said, "Here is the red team. And here is the blue team. I am on the red team," and then described an activity engaged in by one member from each team (e.g., "This kid on the red team likes to play basketball." "This kid on the blue team likes to eat cookies"; see Appendix A).

Through the recording, one member from each team was described as liking to build block towers (the children shown in Appendix A) and the Individual Interaction involved these individuals. As in Study 1, an Individual Interaction between these two individuals was described that was either negative (the individuals met at the block pile and had a fight) or neutral (the individuals met at the block tower, but did not have a fight). In this study, only the Individual Interaction was manipulated (Group Relations were always non-competitive).

Results and Discussion

A binomial regression model revealed a main effect of Individual Interaction, $\chi^2(1) = 3.82$, $p = .05$. As in Study 1, when the Individual Interaction was neutral, preschoolers rarely designated only the target team (the majority of children responded that the target would be friends with everyone), and describing the Individual Interaction as negative significantly increased the odds of designating only the target group (*OR* = 4.58, $p < .05$, see Figure 1). As in Study 1, explanations varied depending on whether preschoolers designated only the target group

(29% team, 21% fairness, 21% psychological, 28% other) or everyone (0 team, 6% equality, 59% psychological, 35% other), $\chi^2(3) = 8.96$, $p < .03$.

Participants in Study 2, like those in Study 1, indicated that the target character was more likely to withhold friendship from members of the other team following a Negative Individual Interaction. These data again show that preschoolers expect negative interactions between individuals to have consequences for the relationships among other members of their groups. Furthermore, the results from Study 2 suggest that they do so even when the members of each group are not coordinating their actions towards a shared goal at the time of the conflict.

Study 3

There were two aims of Study 3. The first aim was to conceptually replicate the findings of Studies 1 and 2 using a different method and dependent variable. In Study 3, instead of asking children whom a target character would identify as friends, children were directly asked to make predictions about future conflict-relevant behaviors. This method provides a more direct test of whether children expect conflict between individuals to cause further conflict among the groups.

The second aim was to begin to test the process underlying children's inferences. We have proposed that children's inferences reflect the integration of new evidence (an instance of conflict involving individuals) with children's naïve theory that social groups mark people who are obligated to one another. Thus, we propose that children infer that an instance of conflict between individuals will *cause* subsequent conflict between the groups, as other group members are motivated to act on behalf of their threatened social partner.

Yet, Studies 1 and 2 are open to an alternate interpretation; namely, that children's inferences were driven by the same process as has driven category-based inferences in prior work—an assumption that category members are fundamentally similar to each other and so

engage in similar behaviors. For example, children could extend the behavior "is mean to the blue group" from one red group member to the entire red group, much like they might extend the behavior "likes a new game called daxing" from a single girl to girls in general (Diesendruck & haLevi, 2006; Rhodes & Gelman, 2008; Waxman, 2010). On this account, children's responses in Studies 1-2 would reflect an inference that the individual conflict reflected the general state of group relations (e.g., "aggressing towards the blue group is something that red group members do"), rather than an inference that the individual conflict *caused* subsequent conflict between the groups.

Of course, these two possible processes are not mutually exclusive and both might operate in tandem. Yet, if an understanding of group obligations contributes to these effects, we can make several predictions that do not arise from the assumption of fundamental similarity alone. First, if the group obligations account drives the effects, then we should find that children infer that an individual instance of conflict will cause future conflict regardless of the prior group relations. That is, even if children are told that the groups previously got along well, and thus that the conflict does *not* reflect general, stable properties of the groups, they should still predict that a single instance of conflict will *cause* subsequent conflict. Alternately, if the fundamental similarity account alone drove the effects, then learning that the groups initially got along well together—and thus that the initial conflict does not reflect the general characteristics of either group—should then lead children to interpret the initial conflict as an individual-level event and not extend it to the group. Study 3a evaluates these possibilities.

Study 3a

In Study 3a, children were introduced to two novel groups, as in Studies 1-2, but were told that the initial state of inter-group relations was positive. Children were then told about an

interaction between individual group members that was either negative (focal condition) or neutral (comparison condition), and were asked to make a series of predictions about future social interactions—whether harmful and positive interactions would occur among members of the same or different groups. Telling children that the groups initially got along well should reduce children's baseline expectations that harmful interactions would occur among members of different groups. In Rhodes (in press), children predicted that group members would harm members of other groups over members of their own, even when they had very little information about the groups and when the relations between the groups were neutral; thus, these predictions appear to reflect preschoolers' baseline expectations about how groups constrain harmful social interactions. In Study 3a, on the contrary, we emphasized that the groups previously interacted positively with one another in order to reduce this baseline expectation. We then tested whether learning about single instances of inter-group conflict is sufficient for children to predict future between-group harm. Study 3a therefore evaluates how children expect group relations to change following an individual instance of behavior, as opposed to children's expectations based on abstract theories alone.

Participants. Participants included 36 preschoolers (18 male, 18 female; *M* age = 4;5, range = 4;0-4;10 years; 50% European American, 11% African American, 8% Asian or Asian American, 6% Hispanic, 11% multi-ethnic, 13% unknown). An additional five children were tested but excluded because they did not speak English as their primary language, and had difficulty understanding the instructions. Preschoolers were recruited at the Children's Museum of Manhattan, where families visiting the museum were invited to participate in a study and children then participated in a quiet classroom at the museum. Participants were randomly assigned to one of two (Negative Interaction, Neutral Interaction) conditions.

Procedures. The experimenter presented the participant with a picture of eight children wearing red or blue shirts, alternating by color (see Appendix B). The experimenter explained, "Here are all the kids. They are all in the same class at school. Some of them are in the blue group, and some of them are in the red group, but all the kids like to play together. During recess, they all like to play outside on the jungle gym together. And when they are inside, they like to do puzzles together." Unlike in Studies 1 and 2, we referred to the groups in Study 3 as "groups" instead of "teams" to further communicate that that the groups got along well before the conflict. Next, the story varied by condition. In the Neutral Interaction condition, the participant was shown a picture of one blue child and one red child sitting next to each other and told, "One day, a kid from the blue group and a kid from the red group sat next to each other when they were taking a test." In the Negative Interaction condition, the participant was shown a picture of one child pushing a child from the other group and told, "One day, a kid from the blue group pushed a kid from the red group."

In both conditions, the experimenter continued, "Now I am going to ask you about some stuff that happened on a different day." Then, participants were asked a series of test questions where they predicted whether future interactions would occur between members of the same group or members of different groups (see Appendix B). For each question, the participant was shown two pictures: one of a between-group interaction and one of a within-group interaction, while the experimenter stated, "A kid from the blue group stole a cookie from somebody. Who did she steal a cookie from? Did she steal a cookie from another kid from the blue group? Or did she steal a cookie from a kid from the red group?" The participant then designated the interaction that they expected to occur (scored "1" if they pointed to the between-group interaction; "0" if they pointed to the within-group interaction). Children were asked three key

test questions about negative interactions (questions asked about hitting, stealing, and teasing). For each item, the answer choices depicted different individuals from the red and blue groups.

Following the three key test questions, children were asked three additional test questions, intended as control items here. These actions asked about three positive actions (whether someone from the blue group gave a hug to, shared with, and played with someone from the blue group or red group). These items were included to rule out the possibility that depiction of the initial negative inter-group interaction induced a simple response bias to predict further inter-group interactions (as if so, children should continue to make between-group predictions, even on the positive behaviors). Whether the agent in each interaction was from the blue group or the red group and the lateral position of the within-group interaction during each test question were counterbalanced across participants.

Results and Discussion. As shown in Figure 2, children more often predicted that the harmful behaviors would occur between members of different groups in the Negative Individual Interaction condition (M = .80, CI = .67, .89) than in the Neutral Individual Interaction condition (M = .61, CI = .48, .73), Wald χ^2 (1) = 4.52, p = .03. The Negative Individual Interaction increased the odds of predicting that harmful interactions would occur among members of the different groups by 2.58. This pattern did not extend to the test questions about positive behaviors, however, indicating that children in the Negative Individual Interaction condition did not develop a simple response bias towards the between-group interactions. Children were equivalently likely to predict that positive behaviors would occur among members of different groups in the Negative Individual Interaction condition (M = .63, CI = .49, .75) and Neutral condition (M = .53, CI = .40, .65), Wald χ^2 (1) = 1.12, $p > .25$.

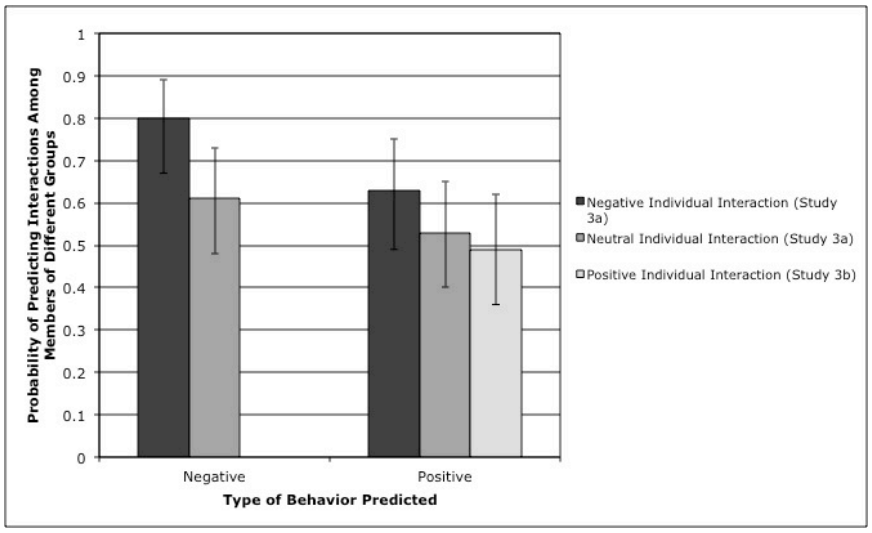


Figure 2. Probabilities of predicting interactions among members of different groups (Studies 3a-3b). Error bars represent 95% Wald Confidence Intervals.

Thus, Study 3a shows that when children are told that the initial state of group relations is positive, they expect harmful interactions to occur among members of the same and different groups equally often. Yet, a single negative interaction between members of different groups increases the likelihood that they will predict negative interactions among other group members in the future. These data are consistent with those from Studies 1 and 2, and extend the key finding demonstrated in those studies to another dependent variable (predictions of harmful behaviors, instead of simply withholding friendship) and to circumstances where children are directly told that there was no pre-existing conflict between the groups. These data are thus consistent with the proposal that children expect a single negative interaction to *cause* subsequent negative interactions among other members of the groups.

Study 3b

The aim of Study 3b was to test whether children expect one instance of positive inter-group behavior to systematically lead to future positive inter-group behavior. If children simply generalize a behavior observed in one group member to the group because they expect group

members to be fundamentally similar to one another and thus to behave in similar manners, we should find that children expect one positive interaction to predict subsequent positive inter-group interactions. Alternately, if children's responses in Studies 1, 2, and 3a reflect beliefs that one instance of conflict will cause subsequent conflict because of group members' obligations to protect one another, then they should not generalize positive inter-group interactions in the same manner. Rhodes (in press) found that children first apply their naïve theories of social groups only to harmful behaviors; the belief that groups constrain positive behaviors (e.g., that people will be more likely to help their own group members) develops later in childhood. A possible interpretation of this pattern is that avoiding harm is viewed as more obligatory than providing help (Knobe, 2010); thus, beliefs about harm are more dependent on expectations about how obligations vary by groups. From this perspective, if the effects found in the present studies reflect children's intuitions about group obligations, and not simply their expectation of similarity among group members, children should expect single instances of harmful between-group interactions, but not single instances of positive between-group interactions, to predict further interactions of a similar kind (as they should view only the harmful behaviors as relevant to group-based obligations).

Participants and Procedures. Participants included 17 4-year-olds (*M* age = 4;5, Range = 4;0-4;10; 7 male, 10 female; 47% White, 12% Hispanic, 6% Middle Eastern, 6% Multi-ethnic, 30% unknown). The experimental procedures for Study 3b were identical to those used in the focal condition of Study 3a except that instead of a Negative Interaction, a Positive Interaction was used (a child from the blue group gave a child from the red group a hug while they built a tower together; see Appendix B). Study 3b used the same test questions about positive interactions as were used as control items in Study 3a. Children were not asked test questions

about negative interactions in Study 3b because we sought to evaluate whether children's expectations were based on an assumption of fundamental similarity among category members, and such an assumption would not support inferences about negative behaviors following an instance of positive behavior.

Results and Discussion. Children predicted that positive behaviors would occur among members of the same and different groups equally often (M = .49, CI = .36, .62), even though they were shown an initial instance of a positive behavior occurring among members of different groups. Thus, they did not expect one positive interaction among individuals from different groups to predict subsequent positive inter-group interactions. Furthermore, children predicted positive between-group interactions no more often here than they did in the neutral condition of Study 3a (Study 3a, Neutral, M = .53, CI = .40, .65), Wald χ^2 (1) = .14, p > .70. Thus, we found no evidence that they expected a positive interaction between individuals to increase the likelihood of positive behaviors between groups. Study 3b therefore confirms that children's responses in the previous studies reflected inferences that one instance of individual conflict will *cause* subsequent inter-group conflict because group membership obligates social partners to act on each other's behalf, not simply because they expect all individual behaviors to generalize across groups.

General Discussion

In these studies, preschoolers expected a conflict between two individuals to spread to other members of those individuals' social networks. When exposed to a conflict between individuals from different groups, children reliably predicted that other members of the groups would no longer be friends with one another. They did so even though these other group members were not involved in the original conflict, even when the members of each group had

not been previously coordinating their actions towards a shared goal, and even when the previous relations between the groups were neutral. Therefore, these data show that children saw a negative interaction between individuals as having direct negative consequences for future group relations, incorporating that specific instance of harmful behavior into their abstract expectations about social groups.

In addition, preschoolers in the present studies predicted future instances of between-group harm to occur following a single instance of conflict, but not following a neutral interaction; again, they did so even though the two groups were described as having gotten along before the conflict. This finding provides further evidence that children expect a conflict between individuals to spread to other members of those individuals' social allegiances. This pattern also shows that preschoolers view conflict between individuals as *causing* a change in future group relations, not as a reflection of a pre-existing state of inter-group conflict.

Especially interesting is the finding that children did not show similar effects for positive behaviors; after one between-group positive interaction, children did not reliably predict future between-group positive interactions. This finding reflects a key component of what it means for individuals to be obligated to one another. In all of the present studies, we demonstrate that children incorporate individual instances of behavior into a naïve theory of social groups, where group memberships mark individuals who are intrinsically obligated to protect one another. They do so by predicting that individuals will aggress against others who have posed a threat to their in-group members, and thus generalizing harmful behaviors to further between-group interactions. Children are, however, selective in what types of behaviors they will generalize to future interactions; they do not make similar generalizations for between-group positive behaviors. This selectivity is consistent with the idea that group obligations are relevant for

protecting one's fellow group members from (and retaliating against) outside harm, but not for facilitating nice behaviors (Knobe, 2010).

The present studies do not provide direct evidence that children's predictions reflect their expectations about obligations. Alternate possibilities include that these responses reflect their theories of desire or emotion (e.g., their beliefs about when people would *want* to harm members of other groups), for example. Although this is an important possibility to consider in future work, it is unclear why children's naïve theories of emotion or desire would lead them to expect negative behaviors—but not positive behaviors—to generalize across groups. Children often show a very robust "positivity bias" in their trait-based and emotion-based reasoning that emerges as early as age 3 and persists across the early and middle childhood years (Boseovski, 2010). For example, children require a great deal more information about past negative behaviors to make negative trait attributions than they do about past positive behaviors to make positive trait attributions (Boseovski & Lee, 2006). Also, even when given multiple exemplars of negative behaviors, children are reluctant to judge negative behavior as intentional (Jones & Thomson, 2001). Thus, if children relied on their theories of emotion or desire in the present studies, then they would have been unlikely to show effects only for negative behaviors; indeed, perhaps they would have done so only for positive behaviors instead. Also, a number of other studies indicate that obligations—more than information about preferences or desires—shape how preschool-age children understand social categories and predict individual action (Kalish & Lawson, 2008; Kalish & Shiverick, 2004; Rhodes & Chalik, under review). In light of all this prior work, we interpret the present findings not as reflecting children's sense of desire or emotion, but rather as driven by their belief in individuals' obligation to protect fellow group members.

These studies demonstrate a key component of social cognition that has not been addressed by previous research: children's use of the experiences of social partners to predict individual action. To make these inferences, children incorporated new evidence about individual experiences with their abstract theory that groups mark people who are obligated to one another. Previous research has shown that children use individual features, such as beliefs and desires, traits, and past behavior to predict behavior (Cain et al., 1997; Wellman et al., 2001; Wellman, 2002; Wellman & Woolley, 1990), as well as that preschool-age children are sensitive to information about social obligations (Blakemore, 2003; Kalish & Lawson, 2008; Kalish & Shiverick, 2004; Turiel, 1983). The present studies extend this work by showing that children integrate information about individuals' past experiences with beliefs about group-based obligations to predict the behavior of social partners.

This work builds on previous work showing that children incorporate category memberships into their inductive reasoning (Diesendruck & haLevi, 2006; Gelman et al., 1986). Yet, these studies differ from this previous work because they do not show how children infer similarity and reason about the properties that characterize groups; rather, these studies demonstrate how children expect groups to influence patterns of social interactions as a result of social obligations. The present studies also extend previous research on how children use social categories to predict social interactions. By age four, children have been shown to use social categories to predict social relationships (Shutts et al., in press) and view groups as constraining social interactions (Rhodes, in press). Previous studies have not addressed, however, whether children's theories of groups enable them to use the experiences of social partners to predict behavior; the present work adds this key feature to our understanding of the role of social categories in early social cognition.

The present work also differs from previous research on how children's own group memberships influence their beliefs and feelings about the social world. Children are sensitive to their own group memberships by quite early in childhood, consistently favoring their own in-group members over out-group members (Bigler, Jones, & Lobliner, 1997; Dunham et al., 2011; Nesdale & Flesser, 2001). For example, whether groups are based on familiar dimensions (e.g., gender, age, language) or arbitrary and novel categories (e.g., based on shirt color), children respond that they like their in-group members more than out-group members, favor their in-group members on resource distribution tasks, and predict that their own group members will be smarter and luckier (Bigler et al., 1997; Dunham et al., 2011; Patterson & Bigler, 2006). The present studies differ from this body of work in a number of ways. First of all, the children tested here were not members of either group in the story, so their responses could not have been driven by positive feelings about their own group. Second, these studies did not ask children to *evaluate* the characters in the story; rather, these studies examined abstract *expectations* of how social partnerships determine behavior.

The present studies used novel groups, unlike the familiar social categories that have been used in much past work on children's social category-based inferences (Berndt & Heller, 1986; Biernat, 1991; Kinzler et al., 2009; Shutts et al., in press; Taylor, 1996; Taylor et al., 2009). Novel groups are advantageous here because they allow us to be certain that children could not have based their expectations on any pre-existing biases or beliefs about the two groups. By using novel groups, we ensure that children's predictions reflect their abstract expectations about how social groups constrain interaction. Because social categories are often not explicitly labeled in real-world scenarios (or they are not labeled as strongly as the groups in these studies), further studies are necessary to assess the generalizability of these findings to real-

world situations and social groups. Indeed, it was necessary here to make the group labels very explicit to ensure that children understood the unfamiliar categories being presented to them; thus, it is an open question whether these effects will generalize to group contexts where the groups are not explicitly labeled. Future work should examine how the present findings generalize to familiar social categories, such as race and/or gender, as well as other types of groups, such as family members.

The present studies suggest a number of additional questions for future work, especially with regard to how these processes change across development. A great deal of work by Abrams and colleagues (2003, 2008, 2008, 2009) has found that as children grow older, gain more experience in social groups, and develop higher-level perspective-taking skills, they develop richer and more complex theories of groups. For example, older children use groups to make complicated judgments about peer exclusion, where loyalty to the in-group predicts how individuals will be treated by members of their own and other groups (Abrams et al., 2008, 2009). The present studies show that younger children have basic theories of how groups influence individual action, but these processes may be revised in a number of ways as children grow older and develop a more complex understanding of the social world. For example, Rhodes (in press) documented that younger children (age 3-5) expect people to harm members of other groups (instead of members of their own), but do not yet expect people to preferentially help their own group members. Older children (ages 6-10), however, expect both between-group harm and within-group helping. Thus, it is possible that children's basic intuitive theories emerge with regard to obligations about protecting fellow group members from harm, and that as children grow older and gain more experience in group environments, they revise their theories to apply to a wider range of behaviors. From this perspective, children may expect a broader

range of individual interactions to shape future group behaviors with age. Characterizing exactly how these processes change and develop across childhood is an important area for future work. In particular, it will be important to identify how the contributions of children's own experiences in groups, as well as the development of more advanced theory of mind and perspective-taking skills, contribute to these developmental changes.

Another important area for future work is the question of how children weigh different causal factors to predict behavior. As reviewed above, children use a number of factors to predict behavior, including personal preferences, beliefs, and character traits (Cain et al., 1997; Wellman, 1990; Wellman, 2002; Wellman et al., 2001), rules and norms (Kalish & Lawson, 2008; Kalish & Shiverick, 2004), and social categories (Diesendruck & haLevi, 2006; Gelman et al., 1986; Rhodes, in press; Shutts et al., in press; Waxman, 2010). To these factors, we now add certain experiences of social partners. An important next step is to determine how children weigh all of these causal factors against one another to predict individual action. For example, one possibility is that different types of social situations activate different reasoning mechanisms, and thus that children consider only a single class of causal mechanisms for any given scenario. Another possibility is that children consider and integrate multiple classes of causal factors (e.g., preferences, group obligations, prior behavior, and so on) to predict behavior. These (and other) possibilities have different implications for how strategies for social cognition might shift across development—separating and evaluating them will be an important area for future work.

Another key question for future work is how the mechanisms discussed here relate to more implicit mechanisms of social cognition, including those available in early infancy. The mechanisms that we have discussed require a number of underlying cognitive capacities, including the ability to recognize an individual's social partners, identify and track relevant

social interactions, and infer that those interactions have consequences for future behavior. There is evidence that at least some of these capacities are functional early in infancy, as well as in non-human primates. For example, baboons monitor the social allegiances of third parties (Cheney & Seyfarth, 1999), and among Vervet monkeys, observations of aggression between two individuals increase the likelihood of aggression between those individuals' alliance partners (Cheney & Seyfarth, 1986). Thus, representations and monitoring of social allegiances may be evolutionarily ancient components of social cognition and behavior. There is also some evidence indicating that human infants successfully monitor social allegiances (Platten, Hernik, Fonagy, & Fearon, 2010), expecting consistency in relationships between individuals (Beier, Carpenter, & Tomasello, 2010; Hamlin, Wynn, & Bloom, 2007; Kuhlmeier, Wynn, & Bloom, 2003). These implicit mechanisms of understanding the social world may be important precursors to the explicit processes shown in the present studies, and an important issue for future work is to characterize the exact relationship between all of these processes as they emerge, interact, and develop across childhood.

Although all of these issues remain open questions, the present studies provide important insights into children's early developing understanding of the social world. Naïve theories allow children to use abstract knowledge to understand novel situations, thus making inferences that go beyond the information immediately available in the environment to navigate the world. In understanding human behavior and social interactions, children may appeal to both naïve theories of psychology, referring to individual mental states, and of sociology, referring to aspects of the environment beyond the individual. The present work shows an important link between the two: that children use individual experiences in conjunction with their naïve theory of social groups (that group memberships mark social obligations) to form expectations about

future behavior. This work is thus an important step in fully characterizing how children rely on their abstract theories to interpret new evidence and predict behavior as they navigate novel situations and expand their understanding of the social world around them.

References

Abrams, D., & Rutland, A. (2008). The development of subjective group dynamics. In S. Levy & M. Killen (Eds.), *Intergroup attitudes and relations in childhood through adulthood* (pp. 47-65). Oxford, United Kingdom: Oxford University Press.

Abrams, D., Rutland, A., & Cameron, L. (2003). The development of subjective group dynamics: Children's judgments of normative and deviant in-group and out-group individuals. *Child Development, 74,* 1840-1856.

Abrams, D., Rutland, A., Ferrell, J., & Pelletier, J. (2008). Children's judgments of disloyal and immoral peer behavior: Subjective group dynamics in minimal intergroup contexts. *Child Development, 79,* 444-461.

Abrams, D., Rutland, A., Ferrell, J., & Pelletier, J. (2009). Children's group nous: Understanding and applying peer exclusion within and between groups. *Child Development, 80,* 224-243.

Batson, C.D. (1998). Altruism and prosocial behavior. In D.T. Gilbert, S.T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, pp. 282-316). Boston, MA: McGraw-Hill.

Beier, J. S., Carpenter, M., & Tomasello, M. (2010, April). Young Children's Understanding of Third-party Social Relationships. Poster presented at the XVIIth Biennial International Conference on Infant Studies, Baltimore.

Berndt, T.J., & Heller, K.A. (1986). Gender stereotypes and social inferences: A developmental study. *Journal of Personality and Social Psychology, 50,* 889-898.

Biernat, M. (1991). Gender stereotypes and the relationship between masculinity and femininity: A developmental analysis. *Journal of Personality and Social Psychology, 61,* 351-365.

Bigler, R. S., Jones, L. C., & Lobliner, D. B. (1997). Social categorization and the formation of intergroup attitudes in children. *Child development, 68*, 530-543.

Birnbaum, D., Deeb, I., Segall, G., Ben-Eliyahu, A., & Diesendruck, G. (2010). The development of social essentialism: The case of Israeli children's inferences about Jews and Arabs. *Child Development, 81*, 757-777.

Blakemore, J.E.O. (2003). Children's beliefs about violating gender norms: Boys shouldn't look like girls, and girls shouldn't act like boys. *Sex Roles, 48*, 411-419.

Boseovski, J.J. (2010). Evidence for "rose-colored glasses": An examination of the positivity bias in young children's personality judgments. *Child Development Perspectives, 4*, 212-218.

Boseovski, J.J., & Lee, K. (2006). Preschoolers' use of frequency information for trait categorization and behavioral prediction. *Developmental Psychology, 42*, 500-513.

Buell, Jr., E.H., & Sigelman, L. (2008). *Attack Politics: Negativity in Presidential Campaigns Since 1960*. Lawrence, Kansas: University Press of Kansas.

Cain, K.M., Heyman, G.D., & Walker, M.E. (1997). Preschoolers' ability to make dispositional predictions within and across domains. *Social Development, 6*, 53-75.

Cheney, D.L., & Seyfarth, R.M. (1986). The recognition of social alliances by vervet monkeys. *Animal Behaviour, 34,* 1722-1731.

Cheney, D.L., & Seyfarth, R.M. (1999). Recognition of other individuals' social relationships by female baboons. *Animal Behaviour, 58,* 67-75.

Deeb, I., Segall, G., Birnbaum, D., Ben-Eliyahu, A., & Diesendruck, G. (2011). Seeing isn't believing: The effect of intergroup exposure on children's essentialist beliefs about ethnic categories. *Journal of Personality and Social Psychology, 101*, 1139-1156.

Diesendruck, G., & haLevi, H. (2006). The role of language, appearance, and culture in children's social category-based induction. *Child Development, 77,* 539-553.

Dunham, Y., Baron, A.S., & Carey, S. (2011). Consequences of 'minimal' group affiliations in children. *Child Development, 82,* 793-811.

Finkelstein, N.W., & Haskins, R. (1983). Kindergarten children prefer same-color peers. *Child Development, 54*, 502-508.

French, D.C. (1987). Children's social interaction with older, younger, and same-age peers. *Journal of Social and Personal Relationships, 4*, 63-86.

Gelman, S., Collman, P., & Maccoby, E. (1986). Inferring properties from categories versus inferring categories from properties: The case of gender. *Child Development, 57,* 396-404.

Gelman, S.A., & Heyman, G.D. (1999). Carrot-eaters and creature-believers: The effects of lexicalization on children's inferences about social categories. *Psychological Science, 10*, 489-493.

Gelman, S.A., & Markman, E.M. (1986). Categories and induction in young children. *Cognition, 23*, 183-209.

Glover, J. (1999). *Humanity: A Moral History of the Twentieth Century.* Great Britain: Jonathan Cape.

Hamlin, J.K., Wynn, K., & Bloom, P. (2007). Social evaluation in preverbal infants. *Nature, 450,* 557-559.

Hodges, E.V.E, Boivin, M., Vitaro, F., & Bukowski, W.M. (1999). The power of friendship: Protection against an escalating cycle of peer victimization. *Developmental Psychology, 35,* 94 -101.

Jones, E.F., & Thomson, N.R. (2001). Action perception and outcome valence: Effects on children's inferences of intentionality and moral and liking judgments. *Journal of Genetic Psychology, 162*, 154-166.

Kalish, C., & Lawson, C. (2008). Development of social category representations: Early appreciation of roles and deontic relations. *Child Development, 79,* 577-593.

Kalish, C., & Shiverick, S. (2004). Rules and preferences: Children's reasoning about motives for behavior. *Cognitive Development, 19,* 401-416.

Katz, P., & Kofkin, J. (1997). Race, gender, and young children. In S.S. Luthar, J.A. Burack, D. Cicchetti, & J. Weisz (Eds.), *Developmental psychopathology: Perspectives on adjustment, risk, and disorder* (pp. 51-74). New York: Cambridge University Press.

Kinzler, K., Shutts, K., Dejesus, J., & Spelke, E. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition, 27,* 623-634.

Knobe, J. (2010). Person as scientist, person as moralist. *Behavioral and Brain Sciences, 33*, 315-329.

Kowalski, K., & Lo, Y. (2001). The influence of perceptual features, ethnic labels, and sociocultural information on the development of ethnic/racial bias in young children. *Journal of Cross-Cultural Psychology, 32*, 444-455.

Kuhlmeier, V., Wynn, K., & Bloom, P. (2003). Attribution of dispositional states by 12-month-olds. *Psychological Science, 14,* 402-408.

Lawson C.A, & Kalish, C.W. (2006). Inductive inferences across time and identity: Are category members more alike than single individuals? *Journal of Cognition and Development, 7,* 233-352.

Maccoby, E., & Jacklin, C. (19897). Gender segregation in childhood. In H.W. Reese (Ed.), *Advances in child development and behavior* (Vol. 20, pp.239-287). San Diego, CA: Academic.

Martin, C.L., Fabes, R.A., Evans, S.M., & Wyman, H. (1999). Social cognition on the playground: Children's beliefs about playing with girls versus boys and their relations to sex segregated play. *Journal of Social and Personal Relationships, 16*, 751-771.

Martin, C.L., & Ruble, D.N. (2010). Patterns of gender development. *Annual Review of Psychology, 61*, 353-381.

Nesdale, D., & Flesser, D. (2001). Social identity and the development of children's group attitudes. *Child Development, 72*, 506-517.

Papachristos, A.V. (2009). Murder by structure: Dominance relations and the social structure of gang homicide. *American Journal of Sociology, 115,* 74-128.

Patterson, M.M., & Bigler, R.S. (2006). Preschool children's attention to environmental messages about groups: Social categorization and the origins of intergroup bias. *Child Development, 77*, 847-860.

Platten, L., Hernik, M., Fonagy, P., & Fearon, R.P. (2010). Knowing who likes who: The early developmental bias of coalition understanding. *European Journal of Social Psychology, 40,* 569-580.

Rhodes, M. (in press). Naïve theories of social groups. *Child Development.*

Rhodes, M., & Chalik, L. (under review). Social categories as markers of intrinsic interpersonal obligations.

Rhodes, M., & Gelman, S.A. (2008). Categories influence predictions about individual consistency. *Child Development, 79,* 1270-1287.

Rhodes, M., & Gelman, S.A. (2009). A developmental examination of the conceptual structure of animal, artifact, and human social categories across two cultural contexts. *Cognitive Psychology, 59,* 244-274.

Shutts, K., Banaji, M.R., & Spelke, E.S. (2010). Social categories guide young children's preference for novel objects. *Developmental Science, 13,* 599-610.

Shutts, K., Roben, C., & Spelke, E. (in press). Children's use of social categories in thinking about people and social relationships. *Journal of Cognition and Development.*

Taylor, M.G. (1996). The development of children's beliefs about social and biological aspects of gender differences, *Child Development, 67,* 1555-1571.

Taylor, M., Rhodes, M., & Gelman, S. (2009). Boys will be boys; cows will be cows: Children's essentialist reasoning about gender categories and animal species. *Child Development, 80,* 461-481.

Tooby, J., & Cosmides, L. (1988). The evolution of war and its cognitive foundations. *Institute for Evolutionary Studies Technical Report #88-1.*

Turiel, E. (1983). *The development of social knowledge: Morality and convention.* Cambridge: Cambridge University Press.

Waxman, S. (2010) Names will never hurt me? Naming and the development of racial and gender categories in preschool-aged children. *European Journal of Social psychology, 40,* 593-610.

Wellman, H.M., & Woolley, J.D. (1990). From simple desires to ordinary beliefs: The early development of everyday psychology. *Cognition, 35*, 245-275.

Wellman, H. (2002). Understanding the psychological world: Developing a theory of mind. In U. Goswami (Ed.), *Blackwell handbook of childhood cognitive development* (pp. 167-187). Malden: Blackwell Publishing.

Wellman, H., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development, 72,* 655-684.

Appendix A

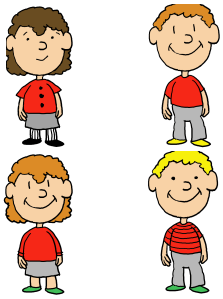
Introductory Story with Illustrations and Key Manipulations, Studies 1 and 2

Figure A1: Introductory Story (Negative Group Relations, Negative Individual Interaction Condition; Text of other conditions appears below)

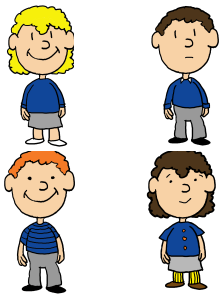
This is a girl named Annie.

Annie says, "I have some flowers! I want to give a flower to ALL of my friends. Let's give them to my friends! But FIRST, I want to tell you what happened today"

"Here is the red team."



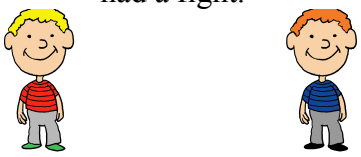
"Here is the blue team."



"I am on the red team."

"Today, we were trying to build a really tall tower. We wanted to build our tower taller and faster than the blue team. We worked together really hard."

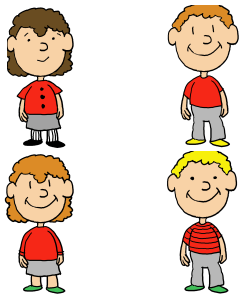
"This boy from the red team went to get us more blocks to use for a tower, and he had a fight with someone from the blue team. The boy from the red team and the boy from the blue team had a fight."

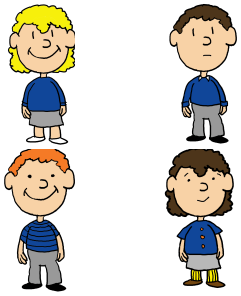


"Then, the boy from the red team came back to our group, and we worked hard together to try and build that tower. We wanted to build our tower really tall and really fast."

Figure A2: Test Phase, All Conditions

"Now here are the flowers! I want to give a flower to all of my friends. Point to who should get a flower."





Introductory Stories by Condition

Study 1: Negative Group Relations, Negative Individual Interaction. Here is the red team. And here is the blue team. I am on the red team. Today, we were trying to build a really tall tower. We wanted to build our tower taller and faster than the blue team. We worked together really hard. This boy from the red team went to get us more blocks to use for a tower, and he had a fight with someone from the blue team. The boy from the red team and the boy from the blue team had a fight. Then, the boy from the red team came back to our group, and we worked hard together to try and build that tower. We wanted to build our tower really tall and really fast.

Study 1: Negative Group Relations, Neutral Individual Interaction. Here is the red team. And here is the blue team. I am on the red team. Today, we were trying to build a really tall tower. We wanted to build our tower taller and faster than the blue team. We worked together really hard. This boy from the red team went to get us more blocks to use for a tower,

and he saw someone from the blue team. The boy from the red team and the boy from the blue team saw each other there. Then, the boy from the red team came back to our group, and we worked hard together to try and build that tower. We wanted to build our tower really tall and really fast.

Study 1: Neutral Group Relations, Negative Individual Interaction. Here is the red team. And here is the blue team. I am on the red team Today, we were trying to build a really tall tower. The red team was building a tower and the blue team was building a tower. We all worked really hard. This boy from the red team went to get us more blocks to use for a tower and he had a fight with someone from the blue team. The boy from the red team and the boy from the blue team had a fight. Then, the boy from the red team came back to our group, and we worked hard together to try and build that tower. We wanted to build our tower really tall and really fast.

Study 1: Neutral Group Relations, Neutral Individual Interaction. Here is the red team. And here is the blue team. I am on the red team Today, we were trying to build a really tall tower. The red team was building a tower and the blue team was building a tower. We all worked really hard. This boy from the red team went to get us more blocks to use for a tower and he saw someone from the blue team. The boy from the red team and the boy from the blue team saw each other there. Then, the boy from the red team came back to our group, and we worked hard together to try and build that tower. We wanted to build our tower really tall and really fast.

Study 2: Negative Individual Interaction. Here is the red team. And here is the blue team. I am on the red team. This kid on the red team likes to play basketball. And this kid on the blue team likes to play basketball. This kid on the red team likes to eat cookies. And this kid on the blue team likes to eat cookies. This kid on the red team likes to ride their bike. And this kid on the blue team likes to ride their bike. This kid on the red team likes to build block towers. And

this kid on the blue team likes to build block towers. This boy on the red team went to get more blocks to use for his tower and he had a fight with this boy from the blue team. The boy from the red team and the boy from the blue team had a fight. Then the boy from the red team and the boy from the blue team went back and they both worked hard to build their towers.

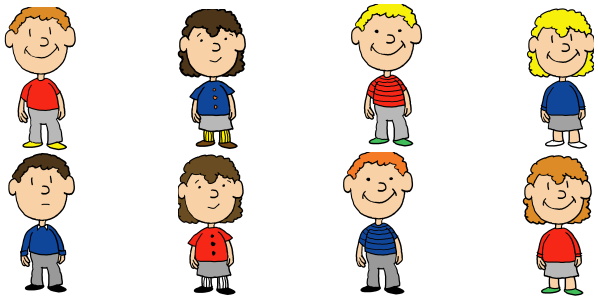
Study 2: Neutral Individual Interaction. Here is the red team. And here is the blue team. I am on the red team. This kid on the red team likes to play basketball. And this kid on the blue team likes to play basketball. This kid on the red team likes to eat cookies. And this kid on the blue team likes to eat cookies. This kid on the red team likes to ride their bike. And this kid on the blue team likes to ride their bike. This kid on the red team likes to build block towers. And this kid on the blue team likes to build block towers. This boy on the red team went to get more blocks to use for his tower and he saw this boy from the blue team. The boy from the red team and the boy from the blue team saw each other there. Then the boy from the red team and the boy from the blue team went back and they both worked hard to build their towers.

Appendix B

Introductory Story with Illustrations, Manipulations, and Test Questions, Studies 3a-3b

Figure B1: Introductory Story

All Conditions: Here are all the kids. They are all in the same class at school. Some of them are in the blue group and some of them are in the red group, but all the kids like to play together. During recess, they all like to play outside on the jungle gym together. And when they are inside, they like to do puzzles together.



Negative Interaction Condition (Study 3a): One day, a kid from the blue group pushed a kid from the red group.

Neutral Interaction Condition (Study 3a): One day, a kid from the blue group and a kid from the red group sat next to each other when they were taking a test.

Positive Interaction Condition (Study 3b): One day, a kid from the blue group and a kid from the red group were building a block tower together. While they were building, the kid from the blue group gave the kid from the red group a big hug!

Figure B2. Sample Test Question Format

Now, I'm going to ask you about some stuff that happened on a different day.

A kid from the blue group stole a cookie from somebody. Who did she steal a cookie from? Did she steal a cookie from another kid from the blue group? Or did she steal a cookie from a kid from the red group?

Text of Test Questions

Harmful Behavior Questions (Study 3a).

(A) A kid from the blue group stole a cookie from somebody. Who did she steal a cookie from? Did she steal a cookie from another kid from the blue group? Or did she steal a cookie from a kid from the red group?

(B) A kid from the blue group hit somebody. Who did he hit? Did he hit another kid from the blue group? Or did he hit a kid from the red group?

(C) A kid from the blue group told somebody to go away. Who did he tell to go away? Did he tell another kid from the blue group to go away? Or did he tell a kid from the red group to go away?

Positive Behavior Questions (Studies 3a and 3b).

(D) A kid from the blue group gave somebody a hug. Who did the kid from the blue group give a hug to? Did he hug another kid from the blue group? Or did he hug a kid from the red group?

(E) A kid from the blue group shared a cookie with somebody. Who did she share a cookie with? Did she share a cookie with another kid from the blue group? Or did she share a cookie with a kid from the red group?

(F) A kid from the blue group told somebody they could play with him. Who did the kid from the blue group tell they could play? Did he tell another kid from the blue group they could play? Or did he tell a kid from the red group they could play?