(Peer) Group influence on children's prosocial and antisocial behavior

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ABSTRACT

This study investigates the influence of moral ingroup versus out-group behavior on 5- and 6-year-olds' and 8- and 9-year-olds' own moral behavior ($N = 296$). After minimal group assignment, children in Experiment 1 observed adult ingroup or outgroup members engaging in prosocial sharing or antisocial stealing before they themselves had the opportunity to privately donate stickers or take away stickers from others. Older children shared more than younger children, and prosocial models elicited higher sharing. Surprisingly, group membership had no effect. Experiment 2 investigated the same question using peer models. Children in the younger age group were significantly influenced by ingroup behavior, whereas older children were not affected by group membership. Additional measures reveal interesting insights into how moral ingroup and outgroup behavior affects intergroup attitudes, evaluations, and choices.

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Introduction

Early in life, children begin to differentiate right from wrong when evaluating others' behavior (Hamlin, 2014). They also start to engage in prosocial behavior themselves, for example, by helping others in need (Warneken & Tomasello, 2009), comforting, or sharing (Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011). But actually behaving in line with moral principles sometimes presents a challenge for young children because it most often comes at personal cost. For example, sharing

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(the moral principle of generosity), which is our main focus here, requires overcoming the desire to keep as much as possible for oneself (Smith, Blake, & Harris, 2013). Children start to share with others during their second year of life (Brownell, Svetlova, & Nichols, 2009), especially after a collaborative activity (Hamann, Warneken, Greenberg, & Tomasello, 2011) or when the recipient is in need (Paulus, 2014). Despite an increase in generosity with age (House et al., 2013) and an increasing preference for fair allocations (Fehr, Bernhard, & Rockenbach, 2008), children rarely share more than 40% of their resources spontaneously (Benenson, Pascoe, & Radmore, 2007; Blake & Rand, 2010), indicating a strong egocentric motivation to keep more for themselves. In some situations, children might even be tempted to behave in an antisocial way, for example, by taking resources that do not belong to them (Engelmann, Herrmann, Rapp, & Tomasello, 2016), especially if no one is watching (Engelmann, Herrmann, & Tomasello, 2012).

Past work does suggest that children's behavior in the context of sharing, our central focus here, is influenced by social norms. Social norms are defined as "rules and standards that are understood by members of a group and that guide and/or constrain social behavior without the force of laws" (Cialdini & Trost, 1998, p. 152). Thus, social norms are created in the context of social interaction and can be transmitted explicitly or implicitly. For example, Blake, Piovesan, Montinari, Warneken, and Gino (2015) found that reminding children of the general norm of fairness (by asking them what they think they should share) significantly increased their donations in a subsequent dictator game. Similarly, McAuliffe, Raihani, and Dunham (2017) found that telling children what other children gave or what adults said they should give affected children's sharing behavior (see also Benozio & Diesendruck, 2017; Ruggeri, Luan, Keller, & Gummerum, 2018), and brief exposure to a reciprocity norm influences sharing behavior in children (Chernyak, Leimgruber, Dunham, Hu, & Blake, 2019). House et al. (2020) found that both cultural norms and novel norms (as stated by adult members of the respective culture) powerfully influence children's sharing behavior.

Who do children learn social norms from? One plausible form of moral socialization is observing others in similar situations (Bandura, 1971). Besides learning morally relevant behavior by watching parents (e.g., Blake, Corbit, Callaghan, & Warneken; 2016), particularly relevant targets of such observation are ingroup members. From 3 years of age onward, children show selective trust in members of their language-based ingroups (Kinzler, Corriveau, & Harris, 2011; Kinzler, Dupoux, & Spelke, 2007) as well as their gender, age, and racial ingroups (Shutts, Banaji, & Spelke, 2010) and prefer to learn new information from ingroup members (e.g., Buttelmann, Zmyj, Daum, & Carpenter, 2013; Corriveau, Kinzler, & Harris, 2013; Howard, Henderson, Carrazza, & Woodward, 2015). Social groups become especially important around preschool age when children not only show a strong preference for their ingroup members on a range of measures (Dunham, Baron, & Carey, 2011) but also derive a number of behavioral consequences from group membership such as the obligations to protect ingroup members from harm (Chalik & Rhodes, 2020; DeJesus, Rhodes, & Kinzler, 2014) and to show loyalty (Misch, Over, & Carpenter, 2014, 2016).

Although much past work has examined the ways in which group membership influences moral behavior more generally (e.g., Jordan, McAuliffe, & Warneken, 2014; Kinzler & Spelke, 2011; Misch, Over, & Carpenter, 2018; Renno & Shutts, 2015), the way in which children's imitation behavior is influenced by their group members' prosocial and antisocial behavior has only recently become the center of interest. For example, Wilks and colleagues have found that children's strong tendency to imitate their group members is not reduced after watching them behave antisocially (Wilks, Kirby, & Nielsen, 2018; Wilks, Redshaw, Mushin, & Nielsen, 2019). Given children's early emerging sensitivity to prosocial and antisocial behavior (e.g., Hamlin, 2014; Hamlin & Wynn, 2011), these results are rather surprising. However, in these studies children were asked to imitate a neutral task and not the morally relevant behavior itself. To our knowledge, only one study directly investigated children's imitation of prosocial and antisocial behavior in the context of group membership. Wilks, Kirby, and Nielsen (2019) showed children videos of antisocial ingroup members' behavior and prosocial outgroup behavior (or neutral behavior as a control). They found that whereas 7- and 8-year-olds were less likely to imitate the antisocial action of the ingroup and copied the prosocial action of the outgroup instead, 4- and 5-year-olds copied both prosocial and antisocial ingroup behavior faithfully, suggesting that for them group membership and its attendant loyalty concerns are a stronger guide than the moral content of the behavior. However, the models in the videos also added a descriptive

norm by stating that "everyone in X group" does it this way, which might have been an additional guide for children's behavior. Similarly, another body of research has focused on how children's and adolescents' resource allocations and their justifications for them are influenced by prevailing group norms. For example, McGuire, Manstead, and Rutland (2017) found that 8- to 16-year-olds are most likely to favor an unfair, ingroup-favoring resource distribution between groups if both the ingroup and outgroup hold a competitive norm, suggesting that in some contexts even older children might endorse group-based interests over fairness concerns in their intergroup behavior (see also Rutland & Killen, 2017, for a discussion of age-related differences in children's reasoning on moral- and group-based concerns).

However, when it comes to moral behavior, children's natural world provides many learning opportunities that occur in the absence of explicit descriptive norms, and thus it is important to understand children's moral learning in more naturalistic situations. Engelmann et al. (2016) looked at whether children imitate their peers' antisocial behavior when facing the dilemma between behaving in line with moral principles (by not stealing or giving a granola bar back to its hungry owner) and conforming to their peers' immoral behavior (by keeping the granola bar for themselves). The majority of children (58%) did not conform to the amoral behavior. Taken together, results of this study and previous research suggest that children do not blindly imitate modeled behavior and that a complex interplay of several factors influences their behavior.

Thus, we aimed to tackle several important questions with the current research. First, to investigate the role of group membership in children's behavior, it is important to look at children's imitation of both ingroup and outgroup members' behavior separately. To compare these, children in our study observed only ingroup members or only outgroup members behaving in a certain way before making their own behavioral choice. Although we know from previous research that children tend to imitate ingroup behavior more than outgroup behavior when both groups have displayed a distinct behavior (Buttelmann et al., 2013; Corriveau et al., 2013; Howard et al., 2015), it is unclear how children react if they receive only information about outgroup behavior. It is possible that in the absence of ingroup information, they might copy the only available (and thus their outgroup's) behavior. Other research suggests that in the absence of ingroup behavior, children might actually be inclined to contrast their own behavior with that of the outgroup (Oostenbroek & Over, 2015), for example, by engaging in the opposite behavior of what they observed the outgroup members do. In the context of moral behavior in this current study, children might also be motivated to contrast their outgroup's behavior, especially when it conflicts with their desire to behave prosocially.

Second, to investigate the extent to which children imitate prosocial and antisocial behavior, it is important to directly compare a prosocial condition with an antisocial condition. In our prosocial condition, children watched how models shared a generous amount of their own stickers by putting them in a donation box with stickers that they believed would "go to other kids who don't have any stickers of their own." Previous studies have shown that children rarely share more than 40% of their resources (Benenson et al., 2007; Blake & Rand, 2010), and thus we expected that most children would spontaneously share between 0% and 40% of their stickers. Therefore, we decided to model a highly generous 60% giving in the prosocial condition. In the antisocial condition of the current study, children watched the models steal one sticker from the other kids by taking it out of the donation box. Thus, the models of both conditions showed behavior that deviated by 20% from the expected behavior (i.e., in the prosocial condition: 20% above the range of expected behavior; in the antisocial condition: 20% below the range of the expected behavior). In both conditions, we elected to have children observe two models from the same group in order to suggest a group-based norm rather than the mere behavior of an individual. Children then had the chance to also share some of their stickers or to take stickers for themselves. We chose sharing as the morally relevant behavior here because it allowed for a wider range of responses and thus more nuanced expression of prosocial and antisocial behaviors. Thus, children could behave prosocially by sharing anything from 2 to 5 stickers, and they could behave antisocially by keeping everything for themselves or by stealing a number of stickers. Note that in contrast to many other studies that investigated prosocial behavior in the intergroup context (e.g., Benozio & Diesendruck, 2017; Dunham et al., 2011; McGuire et al., 2017; Ruggeri et al., 2018), we were not interested in how children would behave toward ingroup and outgroup models but instead

were interested in whether children would imitate their ingroup or outgroup members' behavior. Therefore, the targets of that action were neutral children who were not members of either group.

Critically, in the natural world, prosocial behavior most often entails a personal cost, whereas antisocial behavior quite often comes with a personal benefit. Accordingly, in the current research, children received a number of valuable resources—stickers—and then (after watching the models) had the chance to either share some of them or take even more stickers for themselves. Thus, their tendency to imitate others either coincides or conflicts with their own moral and egoistic concerns, adding another level of complexity to this paradigm.

In addition to social influence on sharing behavior, we included a battery of posttest questions to investigate whether models' moral behavior influenced children's *intergroup attitudes* (*liking* and *niceness evaluation*) and their *intergroup choices* (*friendship choice, reward,* and *loyalty*). Previous research has found mixed results regarding the influence of antisocial ingroup behavior of children's intergroup attitudes for younger children. For example, Hetherington et al. (2014) and Wilks et al. (2018) found reduced liking, whereas Wilks et al. (2019) found consistent ingroup bias in younger children after antisocial ingroup behavior. Therefore, we did not have strong predictions about younger children's intergroup bias, but we expected that older children's evaluations would be influenced by the behavior they observed Wilks et al. (2019). By assessing a wide range of children's reactions to both their ingroup and outgroup members' moral behavior, we hoped to gain a fuller picture of whether children's evaluation of moral behavior is affected by group membership.

Finally, we asked whether children generalize modeled behavior to new group members (*generalization*). Past work suggests that even infants expect members of the same group to act alike (Powell & Spelke, 2013) and think that neutral behavior characteristic of a group *should* be performed by group members (Roberts, Gelman, & Ho, 2017). Therefore, we expected that children would tend to generalize behavior within groups, but we were interested in whether they would be as likely to generalize negative ingroup and positive outgroup behavior as compared with positive ingroup and negative outgroup behavior.

We tested 5- and 6-year-olds because children at this age are sensitive to group membership in lab-created minimal group paradigms (Dunham et al., 2011). To investigate the developmental trajectory, we chose to test an older age group of 8- and 9-year-olds, an age when children become more sensitive to some aspects of group membership, for example, by showing an increased ingroup bias in preference and evaluation of normative versus deviant group members (Abrams, Rutland, & Cameron, 2003), suggesting the possibility that the influence of models might increase with age. In contrast, other research has found that with age children's fairness considerations might outweigh their group-based concerns (e.g., (Wilks et al., 2019)), suggesting that the influence of models might decrease with age.

In Experiment 1, we used adults as group members and models because it is quite common in research on children's learning (e.g., Buttelmann et al., 2013; Corriveau et al., 2013; Howard et al., 2015; Wilks et al., 2018; Wilks, Kirby, et al., 2019; Wilks, Redshaw, et al., 2019) and previous research has shown that children prefer to learn from adults rather than from peers (Rakoczy, Hamann, Warneken, & Tomasello, 2010). However, other research has shown that in the context of moral norms, children do not differentiate between norms posed by adults and norms posed by children (McAuliffe et al., 2017) and that they might even be more sensitive to the moral behavior of peers (Tasimi, Dominguez, & Wynn, 2015). To investigate the social influence of peers, therefore, in Experiment 2 we used same-age models.

In sum, the aim of this study was to investigate the influence of moral ingroup and outgroup behavior on children's own moral behavior. We predicted that children would be affected by their ingroup members' behavior and that they would be more likely to imitate prosocial behavior than antisocial behavior. We also expected younger children to be more susceptible to their ingroup members' behavior than older children. Our predictions were less clear with regard to outgroup behavior because we saw two possible outcomes. On the one hand, in the absence of ingroup information, children might be equally likely to copy the only available behavior, that is, their outgroup's behavior. On the other hand, children might be motivated to contrast the outgroup's behavior, especially when the outgroup behaved in an antisocial manner. With regard to children's intergroup attitudes and intergroup choices, we expected that older children's evaluations would be affected by the observed morally

relevant behavior, but we had no strong prediction for younger children's evaluations. We also predicted that children would generalize the observed behavior within groups, although we were less sure whether this would be equally true for both prosocial and antisocial behavior.

Experiment 1

Method

Participants

We tested 132 children in two age groups; children in the younger age group were 5 or 6 years old (32 girls and 33 boys; M_{age} = 6.17 years, SD = 1.02), and children in the older age group were 8 or 9 years old (33 girls and 34 boys; M_{age} = 9.22 years, SD = 1.32). Based on previous research (e.g., Wilks et al., 2018; Wilks, Kirby, et al., 2019), sample size was determined in advance as a minimum of 16 children per age group and condition. An additional 5 children were tested but excluded because of comprehension issues (n = 3) or experimenter error (n = 1) or for refusing the stickers (n = 1). All children were recruited from and tested at the university's child lab, local schools, and museums in and around a medium-sized East Coast US-American city; effects did not differ among testing locations, so this factor is not discussed further.

The majority of children reported in the two studies were from middle-class families and of European American ethnicity (53% of the children were European American, 5% African American, 5% mixed race, 4% Hispanic, and 3% Asian American (30% of parents gave no information on ethnicity). Written parental consent and children's verbal consent were obtained prior to all testing. The test session was run by a female experimenter (E) and took approximately 15 min. The study was developed and conducted in accordance with ethical guidelines and was approved by the institutional review board of Yale University.

Design and counterbalancing

To disentangle the effects of group condition and moral behavior, every child watched the moral behavior of two members of only one of the groups. Thus, children were tested in a fully crossed 2 (Condition: prosocial [sharing resources with others] vs. antisocial [taking resources from others]) × 2 (Group: ingroup vs. outgroup) between-participant design. We counterbalanced the color of the child's group, color of the group demonstrating the moral action, identity of the actors, and which group was always presented first throughout the whole procedure.

Materials

The actors in the videos were adults and wore orange or green felt scarfs as group markers. Star-shaped stickers with a blue pattern were used as resources. A black cardboard box with a white lid was used as a donation box containing 6 stickers. To help children indicate their choices in the additional questions, we used a 4-point smiley scale with faces ranging from a very unhappy face to a very happy face. The other group members and their actions were shown to children on videos (presented on either a MacBook or an iPad display). Each group consisted of a female adult and a male adult wearing green or orange felt scarfs.

Procedure

Children were tested individually and seated at a table next to E in front of a laptop or iPad display.

Group allocation. First, E allocated children apparently randomly into one of two novel color groups: a green group or an orange group. She then asked children to put on a colored scarf and "introduced" them to the other members of the orange and green groups by showing videos of the 4 models saying "hi" to the children and waving into the camera.

Pretest questions. After a brief warm-up in which children indicated their liking for two or three food items on the 4-point rating scale, children were asked to indicate their liking for both groups (*ingroup*

liking and *outgroup liking*), how nice they thought each of the two male group members was (*ingroup niceness* and *outgroup niceness*), and which of the two male group members they would prefer to be friends with (*friendship choice*).[1]

Manipulation. E placed 5 stickers in front of children, saying that they were the children's stickers now. E then introduced the donation box, opened it briefly to reveal that it already contained a few stickers, and explained that all the stickers in this box would go "to some other children who did not have any stickers of their own." These children were neutral recipients and did not belong to any of the two groups. Then children were told that they could share stickers with the other kids by putting them in the box or that they could take some more stickers out of the box for themselves. Then children were shown videos of what the other members of the two groups did. In the *prosocial condition,* the two members of one group each put 3 of their 5 stickers in the donation box and put 2 stickers in their envelope. In the *antisocial condition,* the two members of one group each took 1 sticker from the donation box and placed all 6 stickers (5 of their own plus 1 from the donation box) in their envelope (Fig. 1). Members of the contrasting groups were shown briefly holding the donation box, but no information was given about their donation behavior. To increase authenticity, the amount of stickers in the box (6) matched the maximum amount of stickers that the actors donated in the videos, that is, 2×3 stickers in the prosocial condition. To ensure equal distribution across conditions, this amount was the same for all participants. However, we did not draw attention to the amount of stickers in the box, and children had a chance to closely inspect them only after they had watched the videos.

By giving children the opportunity to actually observe, rather than merely be told about, the behavior of others, we extend past work that provided explicit information about sharing norms or explicit suggestions about how to distribute resources (Benozio & Diesendruck, 2017; McAuliffe et al., 2017; McGuire et al., 2017; Wilks, Kirby, et al., 2019), assuming that this might better capture exposure to norms in many real-world contexts, which are frequently followed without explicit verbal description.

Resource allocation. After watching the videos, children were told that now it was their turn and that they should put all the stickers they wanted to keep in their envelope and notify E when they were done. To minimize the influence of children's reputational concerns (Engelmann et al., 2012; Engelmann, Herrmann, & Tomasello, 2018; Leimgruber, Shaw, Santos, & Olson, 2012; Piazza, Bering, & Ingram, 2011), children made their decisions in private: E placed a privacy shield between children, the computer monitor, and herself and turned away ostentatiously.

Posttest questions. After the main test, children were asked to indicate their *intergroup attitudes* and *intergroup choices;* we again assessed *liking, niceness evaluation,* and *friendship preference* (this time for the two female group members [see note 1]). Children were then asked to indicate which group should get a "thank you" note from the children who will have received the donated stickers (*reward*) (for exploratory reasons, we also asked children to justify their responses for reward allocation and loyalty, but responses were generally uninformative and were not systematically analyzed). After that, we assessed *generalization.* For that purpose, children were told about another member of the green and orange group each who also had 5 stickers each (accompanied by photographs of unfamiliar group members) and were asked to make predictions about what these members might do (*norm generalization*). Children were then asked to indicate which of the two familiar female group members E should ask for help (*helpfulness generalization*). Finally, we assessed another intergroup choice measure by asking children whether they would like to stay in their group or switch to the other group (*loyalty*).

Control questions. To control for comprehension, after the reward question, children were asked to indicate which group member they observed taking a sticker from the box (antisocial condition) or putting stickers into the box (prosocial condition). After removing the group markers at the end of

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[1] To reduce complexity for the experimenter, we did not counterbalance the presentation of the individuals between pretest and posttest measures. We always presented the two male members pretest and the two female members posttest. Because we only compared the difference in children's evaluation between groups and thus within the same gender, this fixed order did not confound the results.

Fig. 1. Orange group member sharing a sticker (prosocial condition). Green group member taking a sticker (antisocial condition).

the experiment, children were asked which group they were in, whether someone saw what they did in the resource allocation task, and what they did with their stickers in the resource allocation task.

Coding and reliability

The number of stickers children donated or took away in the main test (resource allocation) was assessed by counting the numbers of stickers in the donation box after the test, thereby ranging from −6 (for children who took out all the stickers for themselves) to +5 (for children who donated all their stickers). All other responses were noted by E during the procedure. Children's evaluations were coded with scores from 1 (*not at all*) to 4 (*a lot*), and their group choices were coded as preferring the ingroup or the outgroup. Reliability coding was done by a second independent coder from the videos for all sessions that were videotaped (only 43% of parents gave consent for video-recording). Reliability was nearly perfect for resource allocation (Cohen's weighted kappa, κ = .86) and all the other questions (Cohen's kappa, κ = .97). Inconsistencies were resolved by an independent third coder.

Results

We fitted linear and logistic models by comparing them with reduced models via likelihood ratio tests using R (R Core Team, 2016), retaining terms that were significant or part of a higher-order interaction. If not indicated differently, all models contained group membership, moral condition, and age group as predictor variables. Models investigating posttest effects also contained children's respective pretest score as a control variable (where applicable). When appropriate, Tukey-adjusted least-squares pairwise comparisons were used as follow-up tests to compare between conditions. Assumptions of linear models were tested using the function *gvmla* (Pena & Slate, 2019), and confidence intervals (CIs) of bootstrapped regression (*R* = 2000) were added when assumptions were violated. Data for both experiments is publicly available at https://osf.io/e8xsn/.

Preliminary analysis

Control questions

With one exception, all children remembered their group membership correctly (data for this control question were missing for 2 more children), and the majority (89%) remembered the actors' identity correctly. Most children (85%) believed that no one was watching them during the resource allocation task, 10% indicated that they were not sure, and only 5% said that they believed someone watched them (e.g., the camera, their parents). When asked what they had done with their stickers, 88% responded truthfully, 7% reported to have shared more or taken fewer stickers than was actually the case, and 5% reported inaccurately in the opposite direction, reporting that they had shared fewer

or taken more stickers than was actually the case. Thus, there did not appear to be systematic or motivated errors in children's reporting of their own behavior.

Pretest group preference

Pretest questions confirmed that, in general, children preferred the members of the ingroup to the members of the outgroup: They liked them more (ingroup liking: $M = 3.52$, $SD = 0.74$; outgroup liking: $M = 3.06$, $SD = 0.80$; paired t test, $t(131) = 4.44$, $p < .001$, $d = 0.38$) and preferred to be friends with the ingroup members (friendship choice: 64% vs. 36%; exact binomial test, $p = .001$, $g = .28$). When asked to evaluate the individual group members' niceness, children showed only a marginally significant group bias (niceness: paired t test, $t(131) = 1.90$, $p = .06$, $d = 0.16$).

Resource allocation

We ran a linear model predicting numbers of stickers shared as a function of group membership, moral condition, and age. Test location and gender were included as control variables. Interactions ($ps > .30$) and control variables were not significant ($ps > .44$) and therefore were dropped. The final model revealed that older children shared more stickers ($M = 2.52$) than younger children ($M = 1.07$) (estimate = 1.43, $t(128) = 4.71$, $p < .001$, $d = 0.77$) and that children shared more after watching prosocial models ($M = 2.55$) than after watching antisocial models ($M = 1.07$) (estimate = 1.45, t $(128) = 4.78$, $p < .001$, $d = 0.79$). Group membership of the models, however, had no influence on children's sharing ($p = .65$) (Fig. 2).

Posttest questions

Correlational analysis revealed that most posttest questions were correlated with each other (ingroup liking and ingroup niceness: $r = .60$, $p < .001$; outgroup liking and outgroup niceness: $r = .32$, $p < .001$; intergroup choices and helpfulness generalization: $rs = .37$–$.50$, $ps < .03$). Therefore, to simplify presentation, we collapsed these measures in the interests of brevity (but see online supplementary material for detailed analyses treating each measure separately).

Because we found significant interactions involving age for most posttest questions (outgroup attitudes: age and group membership—estimate = 0.62, $t(125) = 2.63$, $p = .010$, $\eta^2 = .05$, bootstrapped 95% CI [0.14, 1.06]; intergroup choices and helpfulness generalization: age group, moral condition, and group membership—estimate = 0.83, $t(124) = 3.77$, $p < .001$, $\eta^2 = .09$, bootstrapped 95% CI [0.40, 1.24]; ingroup norm generalization: moral condition and age group—estimate = -1.94, $z(130) = -2.34$, $p = .019$, Nagelkerke $R^2 = .06$; outgroup norm generalization: age group, moral condition, and group membership—estimate = 3.41, $z(131) = 2.29$, $p = .022$, Nagelkerke $R^2 = -.06$), we analyzed all posttests for each age group separately.

Intergroup attitudes

Younger children's ingroup and outgroup attitudes were not significantly affected by condition ($ps > .46$) (Fig. 3A and C). In older children's ingroup and outgroup attitudes, we found significant interactions of group membership and moral condition (ingroup: estimate = 1.12, $t(62) = 2.98$, $p = .004$, $\eta^2 = .12$; outgroup: estimate = -0.85, $t(62) = -2.48$, $p = .016$, $\eta^2 = .08$). Older children liked their ingroup members less in the antisocial ingroup condition compared with the prosocial ingroup condition ($p = .007$) and marginally so compared with the antisocial outgroup condition ($p = .07$), suggesting that their ingroup evaluation was negatively affected by watching them behave negatively (Fig. 3B). They liked the outgroup members more in the prosocial outgroup condition compared with all other conditions ($ps < .05$) (Fig. 3D), suggesting that their appreciation of the outgroup was positively affected by watching them behave positively.

Intergroup choices and helpfulness generalization

Children were asked who they preferred to be friends with (friendship), which group deserved a reward (reward), whether they wanted to stay or switch groups (loyalty), and who they expected to help in a different situation (helpfulness generalization). An average score for children's ingroup
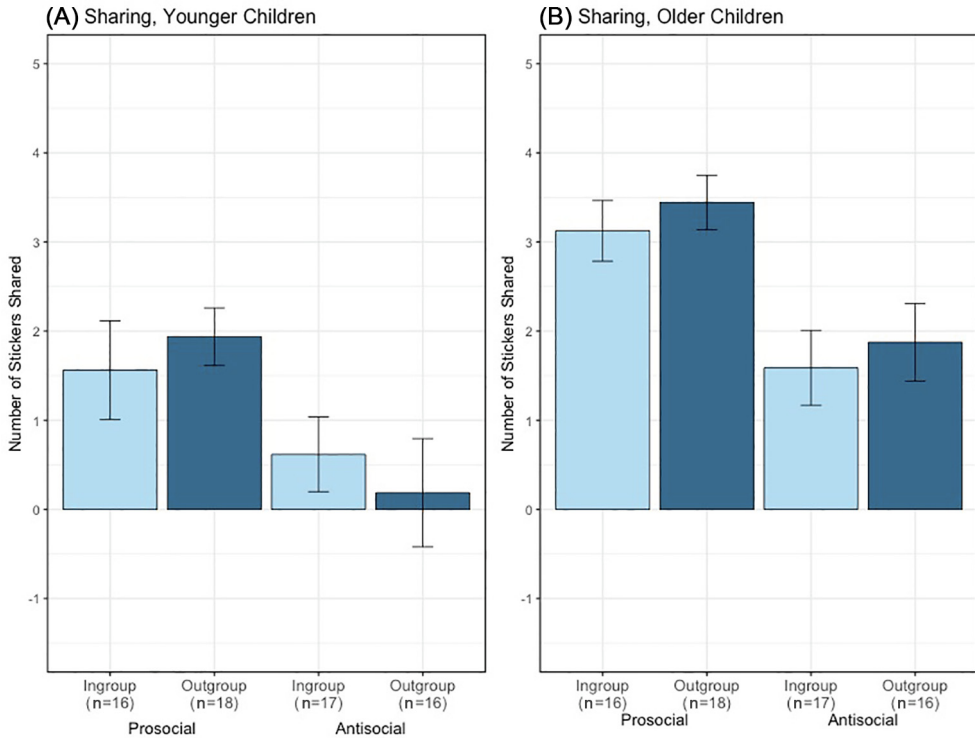
Fig. 2. Numbers of stickers children donated (positive values) or took away (negative values) for younger children (A) and older children (B) in Experiment 1. Error bars show standard errors.

preference was calculated based on children's choices in each of these measures (1 = preferring the ingroup, 0 = preferring the outgroup) and used as dependent variable in the model. The model predicting younger children's choices was not significant in itself (p = .39). An overall binomial test revealed that younger children favored their ingroup members across all conditions (p < .001) (Fig. 3E). In contrast, older children's choices were significantly predicted by a significant interaction (estimate = 0.92, $t(63)$ = 5.41, p < .001, η^2 = .31); compared with the prosocial ingroup condition, children evaluated their ingroup members less positively in the prosocial outgroup and antisocial ingroup conditions (ps < .05). Furthermore, children preferred the ingroup in both the prosocial ingroup and antisocial outgroup conditions (binomial test, p < .001), preferred the outgroup in the prosocial outgroup condition (p = .021), and preferred no group in the antisocial ingroup condition (p = .27). Thus, the models' behavior had a strong influence on older children's intergroup choices. Interestingly, whereas antisocial ingroup behavior reduced their ingroup bias to chance level, prosocial outgroup behavior was sufficient to even reverse children's ingroup bias (Fig. 3F).

Norm generalization

Children were asked whether they expected a new member of the ingroup and a new member of the outgroup to share or take away stickers. In younger children's ingroup norm generalization, we found a main effect of moral condition (estimate = 2.08 , $z(63)$ = 3.42, p < .001, Nagelkerke R^2 = .27), suggesting that after watching prosocial models, children expected prosocial ingroup behavior (binomial test prosocial conditions, ps < .001) but did not generalize antisocial behavior (binomial tests, ps = .38) (Fig. 3G). In older children, we found an interaction of moral condition and group membership (estimate = 2.40, $z(66)$ = 2.672, p = .008, Nagelkerke R^2 = .26); children in the prosocial ingroup condition were more likely to predict prosocial ingroup behavior than children in the prosocial
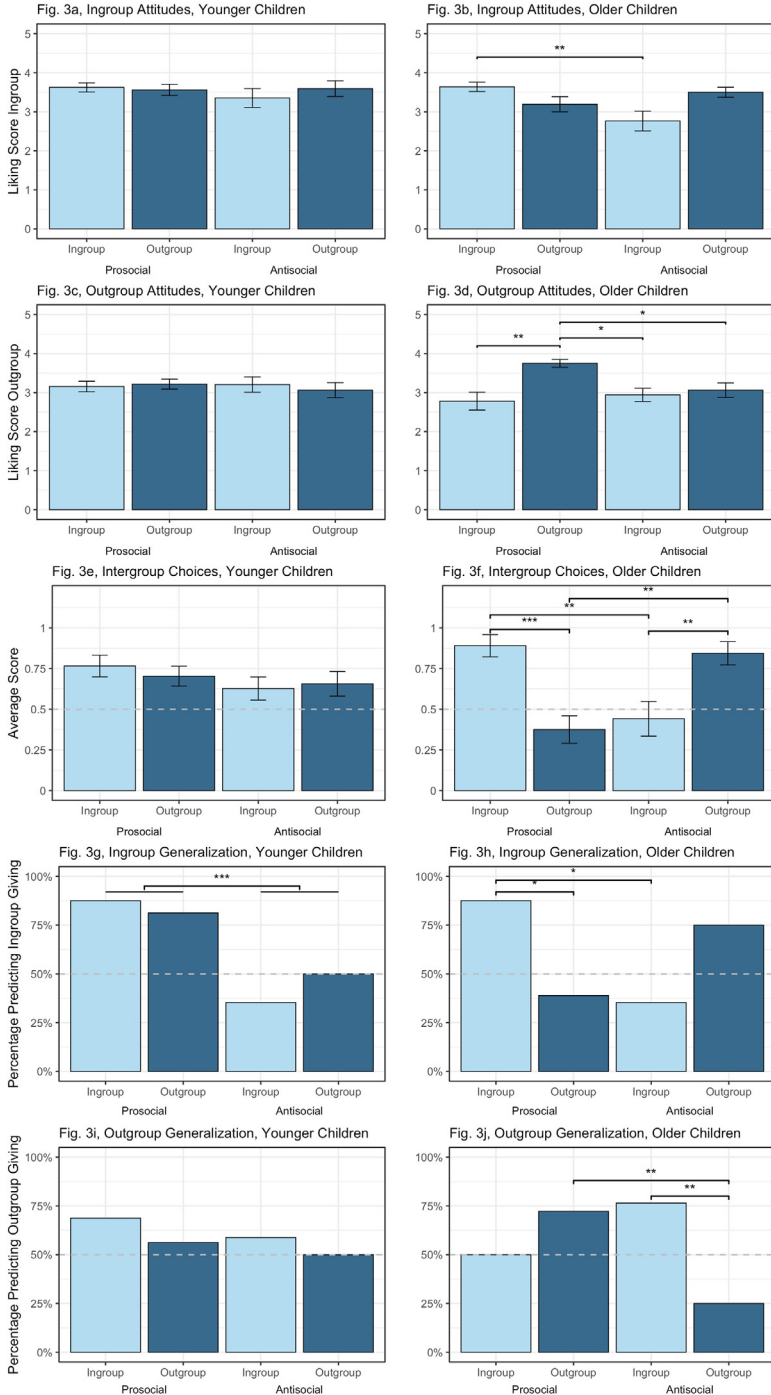
Fig. 3. Children's ingroup attitudes (A, B), outgroup attitudes (C, D), intergroup choices (E, F), ingroup norm generalization (G, H), and outgroup norm generalization (I, J) in Experiment 1. Error bars show standard errors. * p < .05, ** p < .01, *** p < .001

outgroup and antisocial ingroup conditions ($ps < .040$). Binomial tests revealed that children expected their ingroup to share after watching prosocial ingroup members ($p = .004$) and marginally so after watching antisocial outgroup members ($p = .076$). Children held no expectations in the other two conditions ($p > .332$) (Fig. 3H).

Younger children's outgroup norm generalizations were not affected by the manipulations at all (all $ps > .384$), and they did not hold any expectations about the outgroup members' behavior (overall binomial test, $p = .215$) (Fig. 3I). In older children, we found a significant interaction of group membership and moral condition (estimate = 3.23, $z(66) = 2.97$, $p = .003$, Nagelkerke $R^2 = .18$). Compared with the antisocial outgroup condition, children were significantly more likely to expect new outgroup members to share stickers in both the prosocial outgroup and antisocial ingroup conditions ($ps < .05$). In both outgroup conditions, children showed a tendency to predict the behavior they had just observed; in the prosocial outgroup condition they tended to expect prosocial behavior (binomial tests, $p = .096$), and in the outgroup antisocial condition they tended to expect antisocial behavior ($p = .077$). Interestingly, they also expected prosocial outgroup behavior after watching antisocial ingroup behavior ($p = .049$), suggesting a contrast effect. Watching prosocial ingroup members did not affect their expectations for the outgroup's behavior ($p = 1.00$) (Fig. 3J).

Discussion. Our main research question was whether children's sharing behavior would be influenced by observing the prosocial versus antisocial behavior of their ingroup versus outgroup members in a resource allocation task. We found that, in general, children were positively influenced by the models' behavior in that they shared more after watching prosocial models compared with after watching antisocial models, suggesting that social influence affected children's sharing behavior, at least in the prosocial conditions. In contrast to previous research (Engelmann, Herrmann, Rapp, & Tomasello, 2016; Wilks, Kirby, & Nielsen, 2019), children in both age groups were very reluctant to engage in antisocial behavior even after watching antisocial peers. We also found that older children shared more than younger children, supporting previous research showing a decrease of selfish motives with age (Benenson et al., 2007; Blake et al., 2015; Fehr et al., 2008). Surprisingly, group membership had no effect at all on children's sharing behavior, suggesting that, in contrast to previous studies (Buttelmann, Zmyj, Daum, & Carpenter, 2013; Corriveau, Kinzler, & Harris, 2013; Howard, Henderson, Carrazza, & Woodward, 2015; Wilks, Kirby, & Nielsen, 2019), children in our context did not perceive the scope of the norm to be restricted by social identity. We found no evidence that children chose to behave in ways that contrasted with their outgroup members' behavior (Oostenbroek & Over, 2015).

Our additional measures provide some further insight into the psychology underlying these behaviors. Younger children showed consistent ingroup bias across conditions, suggesting that the behavior they observed did not influence attitudes toward the groups. In contrast, older children showed reduced ingroup bias after watching antisocial ingroup members, suggesting that they expect positive behavior from their ingroup members and judge them less positively if they fail to engage in it. Older children's evaluation of their ingroup members was significantly more positive in the prosocial outgroup condition, but not more negative in the antisocial condition, suggesting that older children might expect antisocial behavior but not prosocial behavior from their outgroup members and thus shift their judgment when they see unexpected prosocial behavior. Overall, these results are in line with previous findings that with age children evaluate ingroup and outgroup members based on multiple considerations and increasingly integrate moral concerns into their group judgments (e.g., Abrams et al., 2003; Cooley & Killen, 2015; Killen, Mulvey, & Hitti, 2013; Rutland & Killen, 2017).

An interesting pattern was revealed by the generalization measures. Whereas younger children generalized prosocial behavior to their ingroup members (including after watching the outgroup behave prosocially), older children expected the two groups to engage in contrasting behavior; they predicted donations not only after watching the respective group being prosocial but also after watching the other group acting antisocially for both the ingroup and outgroup. This suggests the developmental emergence of the so-called "meta-contrast principle" (e.g., Campbell, 1958; Leach et al., 2008; see also Oostenbroek & Over, 2015) in which group behavior is thought to differ from that of saliently contrasting groups. Another interesting aspect of this finding is that despite their expectation of contrasting group behavior from the models, older children did not act according to this expectation

themselves. This is in line with research on the social reasoning development account, suggesting that when it comes to moral issues, with age children acknowledge both the group and individual perspectives at the same time (e.g., Rutland & Killen, 2017). The results of this study open up an important question: Why did group membership not influence children's sharing? Our pretest and posttest measures indicate that this cannot be explained by a failure of our group manipulation; children significantly preferred their ingroup members to the members of the outgroup on all three pretest group preference measures and showed different evaluations of the models based on both group membership and moral condition on most measures, suggesting that the models' group membership was important to them. One potential explanation for this surprising finding is that we used adult models in the videos and that children therefore did not identify enough with their group members. Previous research has shown that when it comes to prosocial behavior, children might be less inclined to compare themselves with an adult than with another child; when asked to evaluate another child who was morally superior to themselves, children derogated this child, most likely because this child made them look bad in the social comparison. However, when this morally superior person was an adult, children did not derogate the adult, suggesting that adult models might not instill social comparison (Tasimi et al., 2015). Therefore, in Experiment 2, we performed a close replication of Experiment 1 but using child models. In addition, to investigate the direction in which the group models influenced children's sharing, we added a neutral condition in which children did not receive any information about what their group members did.

Experiment 2

Method

Participants

We tested 164 children in two age groups; children in the younger age group were 5 or 6 years old (39 girls and 41 boys; M_{age} = 6.12 years, SD = 0.60), and children in the older age group were 8 or 9 years old (44 girls and 40 boys; M_{age} = 8.98 years, SD = 0.61). Sample size was predetermined in advance, with the goal to test at least 16 children per age group and condition. An additional 6 children were tested but excluded because of refusal to take the stickers (n = 3), developmental delay (n = 1), or interruption of the procedure (n = 1) or because they were run in a similar study prior to the test session (n = 1).

Design and counterbalancing

Children in the experimental conditions were tested in the same 2 (Condition: prosocial vs. antisocial) × 2 (Group: ingroup vs. outgroup) between-participant design as in Experiment 1; they received information about the moral behavior of only one of the groups. An additional group of children was tested in a control group where no information about ingroup or outgroup contributions was provided. We counterbalanced color of the child's group, identity of the actors, and which group was always presented first throughout the whole procedure.

Materials

The same materials were used as in Experiment 1; the only difference was that children were featured in the videos (2 girls and 2 boys) instead of adults.

Procedure

The procedure was exactly the same as in Experiment 1 for the experimental conditions. In the control condition, we omitted the part where children watched the models' action as well as the respective memory question in which children were asked to indicate which group member took or donated stickers.

Coding and reliability

Results were coded in the same way as in Experiment 1. Reliability coding was done by a second independent coder for all sessions that were videotaped and in which all responses were clearly discernible in the video (72%). Reliability was perfect for resource allocation (Cohen's weighted kappa, $\kappa = 1$) and nearly perfect for all other questions (Cohen's kappa, $\kappa = .93$). Inconsistencies were resolved by an independent third coder.

Results

We first analyzed data as was done in Experiment 1. Then, if the models in this first analysis yielded significant results, we compared experimental conditions with the control condition by running another model that included all four experimental conditions and the control condition as baseline in one single factor. Tukey-adjusted least-squares comparisons were used as follow-up tests when appropriate.

Preliminary analysis

Control questions. All but 4 children remembered their group membership correctly. Most children (82%) believed that no one was watching them during the resource allocation task, 11% indicated that they were not sure, and only 8% said that they believed someone was watching them (e.g., the camera, their parents). When asked what they had done with their stickers, 87% responded truthfully, 4% reported to have shared more or taken fewer stickers than was actually the case, and 8% reported the opposite.

Pretest group preference. Pretest questions confirmed that, in general, children preferred the members of the ingroup to the members of the outgroup: They liked them more (ingroup liking: $M = 3.60$, $SD = 0.63$; outgroup liking: $M = 2.93$, $SD = 0.87$; paired t test, $t(162) = 7.79$, $p < .001$, $d = 0.61$), expected them to be nicer (ingroup niceness: $M = 3.61$, $SD = 0.63$; outgroup niceness: $M = 3.45$, $SD = 0.68$; $t(163) = 2.138$, $p = .022$, $d = 0.18$), and preferred to be friends with the ingroup member (friendship choice: 69% vs. 31%; exact binomial test, $p < .001$, $g = .38$).

Resource allocation

We found a significant interaction of group membership, moral condition, and age group (estimate = 2.49, $t(117) = 2.14$, $p = .035$, $\eta^2 = .03$, bootstrapped 95% CI [0.06, 4.75]) and therefore continued analysis for each age group separately. In the younger age group, we found a significant interaction of moral condition and group membership (estimate = -1.80, $t(63) = 2.46$, $p = .017$, $\eta^2 = .07$), suggesting that children were more likely to imitate the respective action when the models were ingroup members. Follow-up comparisons revealed that children in the antisocial ingroup condition shared significantly less than children in both prosocial conditions ($ps < .05$). A model including all four experimental conditions and the control condition as the baseline revealed that, compared with the control condition, children in the ingroup prosocial condition shared significantly more (estimate = 1.13, $t(78) = 2.03$, $p = .046$, $d = 0.71$) and children in the ingroup antisocial condition tended to share less (estimate = -1.06, $t(78) = -1.92$, $p = .059$, $d = 0.67$) (see Fig. 4), indicating that children were affected by both prosocial and antisocial behavior of their ingroup members. Turning to older children, we found a main effect of moral condition (estimate = 0.97, $t(63) = 2.41$, $p = .019$, $d = -0.60$), suggesting that children in the prosocial conditions ($M = 2.88$) shared more than children in the antisocial conditions ($M = 1.91$). A model including the control condition suggests that this effect is driven by the prosocial conditions, where children showed the trend to share more than in the control condition (estimate = 1.00, $t(78) = 1.98$, $p = .051$, $d = 0.61$).

Posttest questions

Correlational analysis again revealed that most posttest questions were correlated with each other (ingroup liking and ingroup niceness: $r = .29$, $p < .001$; outgroup liking and outgroup niceness: $r = .42$, $p < .001$; intergroup choices and helpfulness: $rs = .22–.28$, $ps < .05$). Thus, as in Experiment 1, we

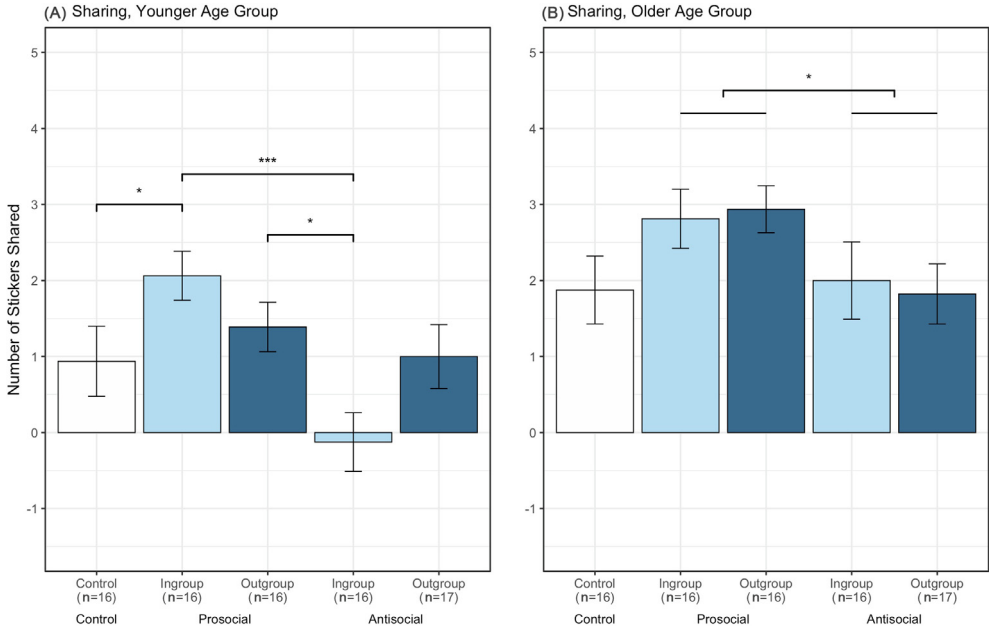**Fig. 4.** Numbers of stickers shared by younger children (A) and older children (B) in Experiment 2. Error bars show standard errors. * p < .05, ** p < .01, *** p < .001

aggregate these measures for ease of presentation but present separate results for each measure in the supplementary material.

Because we found interactions involving age for almost all measures (group membership, moral condition, and age group in ingroup attitudes: estimate = −0.59, *t*(122) = −1.86, *p* = .065, bootstrapped 95% CI [−1.44, −0.13]; outgroup attitudes: estimate = 0.82, *t*(121) = 1.79, *p* = .076, bootstrapped 95% CI [0.05, 1.08]; intergroup choices and helpfulness generalization: estimate = −0.54, *t*(124) = 2.80, *p* = .006, η^2 = .05, bootstrapped 95% CI [−0.90, −0.06]; moral condition and age group in ingroup norm generalization: estimate = 2.38 , *z*(127) = 2.32, *p* = .021, Nagelkerke R^2 = .07; group membership and age in outgroup norm generalization: estimate = 2.68, *z*(125) = 3.27, *p* < .001, Nagelkerke R^2 = .02), we continued analysis separately for both age groups.

Intergroup attitudes. In younger children's ingroup attitudes, we found a marginal significant main effect of moral condition (estimate = 0.19, *t*(63) = 1.96, *p* = .054, η^2 = .04, bootstrapped 95% CI [0.01, 0.37]), indicating that children evaluated their ingroup members more positively in both prosocial conditions (Fig. 5A). In older children's ingroup attitudes, we found a significant interaction of group membership and moral condition (estimate = −0.69, *t*(60) = −2.65, *p* = .010, η^2 = .08, bootstrapped 95% CI [−1.30, −0.04]), suggesting that children's evaluations were significantly affected by their ingroup members' behavior. Children's evaluation in the antisocial ingroup condition was significantly reduced compared with their evaluations in the prosocial ingroup condition (*p* < .001), the prosocial outgroup condition (*p* = .015), and the antisocial outgroup condition (but only marginally so, *p* = .059). Compared with the control condition, children's ingroup liking was significantly reduced in the antisocial ingroup condition (estimate = −0.66, *t*(75) = −3.81, *p* < .001, *d* = 1.35, bootstrapped 95% CI [−1.04, −0.31]) (Fig. 5B).

In younger children's outgroup attitudes, we found a main effect of group membership (estimate = 0.52, *t*(62) = 3.02, *p* = .004, *d* = −0.65, bootstrapped 95% CI [0.08, 0.86]), indicating that younger children showed greater liking for the outgroup members after observing them (outgroup condition: *M* = 3.39; ingroup condition: *M* = 2.91) independent of the valence of that behavior (*p* = .91,
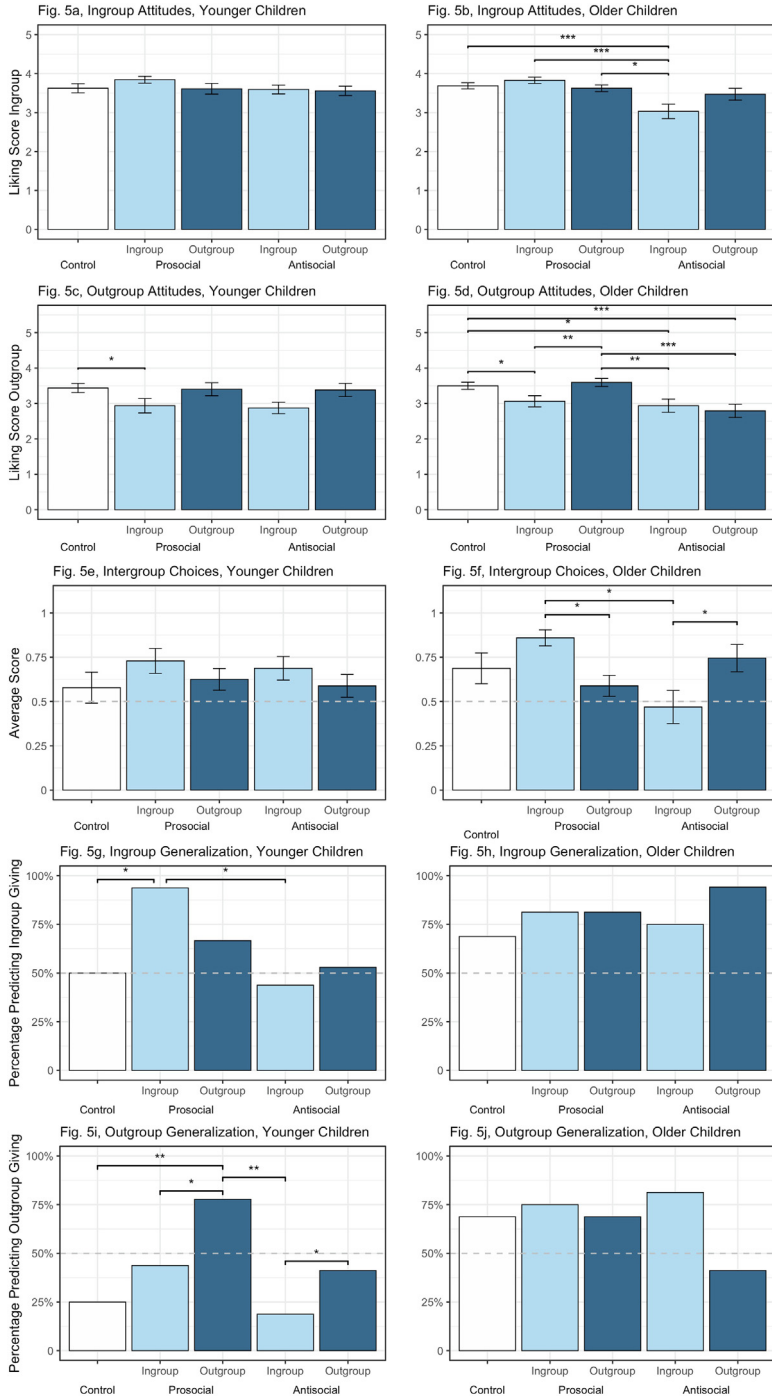
Fig. 5. Children's ingroup attitudes (A, B), outgroup attitudes (C, D), intergroup choices by age group (E, F), ingroup norm generalization (G, H), and outgroup norm generalization (I, J) in Experiment 2. Error bars show standard errors. * p < .05, ** p < .01, *** p < .001

bootstrapped 95% CI [−0.04, 0.38]). Compared with the control condition, children in both ingroup conditions evaluated their outgroup members less positively (prosocial ingroup condition: estimate = −0.50, $t(76)$ = −2.17, p = .033, d = 0.77, bootstrapped 95% CI [−0.45, −0.17]; antisocial ingroup condition: estimate = −0.44, $t(76)$ = −1.89, p = .063, d = 0.68, bootstrapped 95% CI [−0.85, −0.16]), suggesting that this effect was driven by exposure to the ingroup members (Fig. 5C). In older children's outgroup attitudes, we also found a significant interaction of group condition and moral condition (estimate = 0.94, $t(60)$ = 3.05, p = .003, η^2 = .10), suggesting that children's evaluations were affected by the outgroup members' behavior. Follow-up tests confirmed that children in the prosocial outgroup condition liked the outgroup members more compared with children in all other experimental conditions (ps < .01). A model containing the control condition revealed that this effect was driven by a derogation of outgroup members in both ingroup conditions (ps < .03, ds = 0.84) and in the antisocial outgroup condition (p < .001, d = 1.23) (Fig. 5D).

Intergroup choices and helpfulness generalization. The model predicting younger children's choices was not significant in itself (p = .45). Across all conditions, children favored the ingroup (binomial test, p = .006) (Fig. 5E). In contrast, older children's choices were significantly predicted by a significant interaction of group membership and moral condition (estimate = −0.55, $t(61)$ = −3.82, p < .001, η^2 = .19, bootstrapped 95% CI [−0.82, −0.11]). Children evaluated their ingroup members more positively in the prosocial ingroup condition compared with the prosocial outgroup and antisocial ingroup conditions (p < .05) and evaluated them less positively in the antisocial ingroup condition compared with the antisocial outgroup condition (p < .05). A full model containing the control condition as baseline did not reveal a significant difference to any experimental condition *(ps > .05)* (Fig. 5F).

Norm generalization. In younger children's ingroup norm generalization, we found a marginally significant interaction of group membership and moral condition (estimate = 2.47, $z(64)$ = 1.83, p = .068, Nagelkerke R^2 = .09). Children in the prosocial ingroup condition were significantly more likely to predict positive ingroup behavior than children in the ingroup antisocial condition (p = .044). Compared with the control condition, only children in the prosocial ingroup condition were more likely to predict prosocial ingroup behavior (estimate = −1.70, $z(63)$ = −2.83, p = .012, h = 1.04). Children only expected their ingroup members to share after watching prosocial ingroup behavior (binomial test, p < .001) but did not show an ingroup bias in any of the other conditions (ps > .24). Thus, children readily generalized positive ingroup behavior but not negative ingroup behavior. Their expectation of their ingroup members' behavior in the control was at chance level (p = 1.00), suggesting that younger children did not hold a positive expectation toward their ingroup members per se (Fig. 5G). Turning to older children's ingroup norm generalization, we found no effect of group membership or moral condition (ps > .41). A binomial test across all experimental conditions revealed a significant positivity bias (p < .001), confirming that, in general, children expected their ingroup members to share stickers (Fig. 5H). In younger children's outgroup norm generalization, we found a main effect of group membership (estimate = −1.70, $z(63)$ = −2.83, p = .00505, h = −0.75), suggesting that children were more likely to expect prosocial outgroup behavior after watching outgroup members, and of moral condition (estimate = −1.49, $z(63)$ = −2.52, p = .012, h = −0.64), suggesting that children were more likely to expect prosocial outgroup behavior after watching prosocial behavior compared with antisocial behavior. Contrasts with the control condition revealed a significant difference in the prosocial outgroup condition only (estimate = −2.35, $z(79)$ = −2.91, p = .004, h = 1.12), which was also significantly different from chance (p = .031), suggesting that they did generalize prosocial outgroup behavior but not antisocial outgroup behavior (p = .34). Interestingly, they expected antisocial outgroup behavior after witnessing antisocial ingroup behavior (p = .007), suggesting that they generalized antisocial behavior of their ingroup members onto outgroup members. Children in the control condition showed a tendency to expect new outgroup members to behave in an antisocial way (p = .077) (Fig. 5I). In older children's outgroup norm generalization, we found a marginal main effect of group membership (estimate = 1.05, $z(61)$ = 1.86, p = .063), suggesting a tendency to expect less positive behavior after watching outgroup members. Children in the ingroup conditions, but not in the control or outgroup conditions, expected positive behavior from outgroup members (p = .005 vs. ps > .21) (Fig. 5J).

Discussion

Results of the main measure, resource allocation, revealed significant age differences. Younger children were affected by their group members' behavior; they shared more after watching prosocial ingroup members and shared less (or even took resources away) after watching their ingroup members behave antisocially. The outgroup members' behavior had no effect at all. Thus, for younger children, our study suggests that they are susceptible to prosocial and antisocial behavior from their ingroup members. Interestingly, older children were again unaffected by group membership of the models. They shared more after watching both prosocial ingroup and outgroup models but were unaffected by the antisocial models' behavior. Thus, for older children, our data support a social influence hypothesis that is not limited in scope by group membership but is limited to prosocial behavior, pointing at (older) children's stronger inclination to behave in a prosocial manner. Again, we found no evidence that older children chose to contrast their behavior with that of the outgroup.

Turning to our additional measures, we found complex response patterns on most measures. Younger children's ingroup attitudes were mostly unaffected by the models' moral behavior; younger children evaluated their ingroup members equally positively. Interestingly, we found an exposure effect on outgroup attitudes and intergroup partner choices: after being exposed to ingroup members (in the ingroup conditions), they liked their outgroup members less and showed an ingroup bias in the intergroup choices. This ostensible indifference to morally relevant behavior suggests that younger children saw the models' behavior as something situation specific rather than bearing on their moral character in general and speaks to a striking rigidity in their ingroup preferences (see also Wilks et al., 2019). However, the generalization measures revealed that younger children did not completely ignore moral behavior: They generalized the observed prosocial behavior, but not the antisocial behavior, onto new members of the respective groups (i.e., expecting prosocial ingroup behavior in the prosocial ingroup condition and expecting prosocial outgroup behavior in the prosocial outgroup condition). They only ever expected antisocial behavior from the outgroup members but, interestingly, solely in the antisocial ingroup conditions, suggesting a tendency to make the ingroup look less negative in comparison with the outgroup.

In contrast, as predicted, older children's intergroup attitudes were affected by moral condition; older children evaluated both ingroup and outgroup members less positively after watching them behave antisocially. In the intergroup choices, they showed an ingroup bias after watching positive ingroup behavior or negative outgroup behavior. Interestingly, just like younger children, after watching antisocial ingroup members, they also devalued outgroup members, suggesting a motivation to derogate the outgroup when the ingroup behaved negatively. The generalization measures also revealed a robust positivity bias in older children; they expected prosocial behavior from new members in most conditions except after witnessing antisocial outgroup behavior, suggesting that their positivity bias was more pronounced regarding the ingroup. Thus, we can conclude that older children have a more differentiated view and expect moral behavior to be more defined by personal character than by group membership.

General discussion

We examined positive and negative social influence in the intergroup context on children's resource-related behavior regarding neutral targets. Importantly, this study is the first of its kind to investigate the effects of prosocial and antisocial behavior separately by assessing children's imitation of their ingroup and outgroup models' behavior in a between-participant design. We found that all children were influenced by the models' behavior in that they shared more after watching prosocial models and shared less after watching antisocial models. However, the effect of the models' group membership on children's behavior was rather restricted; group membership of adult models had no effect at all, whereas group membership of peer models affected only younger children's behavior and even then only when observing ingroup models.

Thus, although results of our main measure generally support the hypothesis that children are susceptible to social influence, we found that children are not blindly conformist; rather, in contrast to

previous research (Wilks et al., 2019), we found that imitation of antisocial behavior was generally low and restricted to younger children watching peer models. Vulnerability to peer group influence in younger children has also been reported in previous studies on conformity (Haun & Tomasello, 2011; Engelmann et al., 2016) as well as research demonstrating a primacy of group interests over moral concerns (McGuire et al., 2017; Misch et al., 2018). Thus, our study highlights the younger age group as a time in children's development when they seem to be particularly sensitive to peer influences for better or worse, perhaps indicating a sort of "sensitive period" when children are working to extract the norms embedded in peer behavior.

In contrast, older children's moral behavior seems to be guided by a general norm for fairness and prosociality that is susceptible to prosocial models but not to antisocial models (McAuliffe et al., 2017). Thus, our research contributes to a body of research on conformity in children, adolescents, and adults (e.g., Constanzo & Shaw, 1966; Haun, van Leeuwen, & Edelson, 2013; Kundu & Cummins, 2013; Walker & Andrade, 1996) but at the same time offers a more nuanced picture by showing that with age children become better at integrating conflicting motivations such as selfish concerns, moral concerns, and group-based motivations (Rutland & Killen, 2017). In line with previous work, we also found that older children are more generous than younger children (Benenson et al., 2007; Blake et al., 2015; Fehr et al., 2008). This can be accounted for in part by a more well-understood or deeply internalized norm of fairness, as has been shown by research in the context of group-based resource allocation (e.g., Elenbaas & Killen, 2016; Elenbaas, Rizzo, Cooley, & Killen, 2016) This strong norm of fairness could also help to explain why group membership did not affect older children's moral behavior; that is, if the norm of fairness is strong enough in certain contexts, it could swamp potentially subtler effects of group membership (see McGuire et al., 2017).

It is interesting that group membership of adult models, in contrast to group membership of child models, had no effect on children's behavior at all even though our additional measures confirm that children were affected by group membership regarding their attitudes, choices, and generalizations. Even though past work did not find a difference between moral norms that were indirectly posed by adults versus children (McAuliffe et al., 2017), and contrary to findings showing that children prefer to learn new information from adults versus children (Rakoczy et al., 2010), our results suggest that children might be more likely to identify and compare themselves with same-age models than with adults when it comes to morally relevant behavior (Tasimi et al., 2015). Thus, our study is the first to show a reduced effect of social learning from adult models in the intergroup context and highlights the importance of careful methodological considerations regarding the use of child versus adult models in the area of moral norms and group psychology.

Our additional measures dovetail with past work suggesting increasing integration of group-based aspects and moral concerns as a function of age (e.g., Abrams et al., 2003; Rutland & Killen, 2015, 2017; Wilks et al., 2018; Wilks, Kirby, et al., 2019; Wilks, Redshaw, et al., 2019; Wilks & Nielsen, 2018). Whereas younger children showed a strong ingroup bias that was resilient to their ingroup members' antisocial behavior, older children's bias was significantly reduced after watching antisocial ingroup members. Older children also showed a more nuanced evaluation of the models that was based on the models' behavior rather than on their group membership. At the same time, our study reveals new insights into a complex developmental trajectory of children's evaluation and generalization of others' moral behavior in the intergroup context. First, our results show that the behavior of one group affected children's evaluation of the other group in that children expected them to show the opposite behavior and evaluated them accordingly, early evidence of the meta-contrast principle in intergroup reasoning (e.g. Campbell, 1958; Leach et al., 2008; see also Oostenbroek & Over, 2015). Second, we found that after watching ingroup members behave negatively, children in both age groups derogated outgroup members, suggesting that from early on children desire to be in a group that appears in a more positive light than the outgroup.

Another goal of our study was to contribute to research investigating children's behavior in more naturalistic settings (e.g., Engelmann et al., 2016; Haun & Tomasello, 2011). Therefore, in our study children needed to infer norms indirectly from the behavior of others rather than merely react to verbal information about existing norms (McAuliffe et al., 2017). Furthermore, the study was conducted using real resources, so that sharing was direct and costly for children. Finally, to reduce demand characteristics or reputational concerns (Engelmann, Herrmann, & Tomasello, 2012, 2018; Leimgruber,

Shaw, Santos, & Olson, 2012; Piazza, Bering, & Ingram, 2011), children shared their stickers in private. However, further research is needed to investigate children's social learning with regard to other morally relevant behaviors (e.g., helping, informing) as well as with regard to other types of group membership (e.g., culturally salient real-world groups) that could exert different or stronger influence.

In closing, our study sheds light on children's moral learning in the group context and how their behavior is affected by group-based influences versus moral considerations. Our research highlights the younger age group as a sensitive phase for both prosocial and antisocial peer influences, suggesting that as soon as children start to robustly identify with minimal ingroups, they are vulnerable to both prosocial and antisocial peer influences. With age, children's developing moral compass makes them more resilient against antisocial influence while leaving them flexible enough to adjust their behavior in response to prosocial influence. This finding, more optimistic than much that comes from developmental intergroup research, suggests rich avenues for future study of norm internalization and subsequent flexibility.

Author contributions

A.M. designed the experiments, collected and coded the data with help from research assistants, analyzed the data, and wrote the first draft of the manuscript. Y.D. contributed to the study design and provided critical revisions to the manuscript. Both authors approved the final version of the manuscript for submission.

Acknowledgments

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jecp.2020.104994.

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