

## Evaluations versus expectations: Children's divergent beliefs about resource distribution

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### **Abstract:**

Past research reveals a tension between children's preferences for egalitarianism and ingroup favoritism when distributing resources to others. Here we investigate how children's evaluations and expectations of others' behaviors compare. Four- to 10-year-old children viewed events where individuals from two different groups distributed resources to their own group, to the other group, or equally across groups. Groups were described within a context of intergroup competition over scarce resources. In the *Evaluation* condition, children were asked to evaluate which resource distribution actions were nicer. In the *Expectation* condition, children were asked to predict which events were more likely to occur. With age, children's evaluations and expectations of others' actions diverged: Children evaluated egalitarian actions as nicer yet expected others to behave in ways that benefit their own group. Thus, children's evaluations about the way human social actors should behave do not mirror their expectations concerning those individuals' actions.

**Keywords:** Social cognition | Egalitarianism | Cognitive development | Intergroup behavior

### **Article:**

#### **1. Introduction**

Children's reasoning about resource distribution highlights an emerging tension between the norms of egalitarianism and prioritization of one's own group (e.g., Fehr, Bernhard, & Rockenbach, 2008). Children, like adults, often believe it is fair to share equally with everyone, yet they sometimes prioritize the interests of their own group. In investigating the origins of human beliefs about fairness and resource distribution, past research has largely focused on

children's own behaviors or evaluations of others' actions. We know less about children's expectations of how others will behave. The current paper investigates how children's expectations and evaluations of others' behaviors compare. If children believe that people should act in egalitarian ways, do they expect others to actually abide by those principles? Are children's beliefs about what *should be* compatible with their beliefs about what *is*?

Young children demonstrate a preference for equal distributions of resources (Baumard, Mascaro, & Chevallier, 2012; Birch & Billman, 1986; Blake & McAuliffe, 2011; Damon, 1977; Gummerum, Hanoch, Keller, Parsons, & Hummel, 2010; Lane & Coon, 1972; Sutter, 2007), by as early as the second year of life (Geraci & Surian, 2011; Schmidt & Sommerville, 2011; Sloane, Baillargeon, & Premack, 2012). By age 3, children display emotional reactions when resources are distributed unequally (LoBue, Nishida, Chiong, DeLoache, & Haidt, 2011), and they share equally with preschool classmates after working collaboratively to obtain resources (Warneken, Lohse, Melis, & Tomasello, 2011). Children's preferences for equality and reciprocity also increase across development (Damon, 1977). As illustration, children reject situations that create inequalities between themselves and a peer; this rate of rejection increases from ages 4 to 8 (Blake & McAuliffe, 2011). Recent research also finds that children across ages endorse norms of equal sharing, yet older children (7–8-year-olds) are more likely than young children (3–4-year-olds) to actually engage in egalitarian sharing behavior (Smith, Blake, & Harris, 2013).

Children's early-developing preferences for equality depict an optimistic portrayal of human nature, yet in reality the social world does not always operate in egalitarian ways. Rather, when allocating resources themselves, adults and children often prioritize members of their own group (Bernhard, Fischbacher, & Fehr, 2006; Bigler, Jones, & Lobliner, 1997; Dunham, Baron, & Carey, 2011; Fehr et al., 2008; Goette, Huffman, & Meier, 2006; Tajfel, Billig, Bundy, & Flament, 1971). For example, the amount of resources that 6- to 12-year-old children donated to their classmates was positively correlated with how long participants had attended their school (Harbaugh & Krause, 2000). Children also direct targets to share more resources with family and friends than with strangers (Olson & Spelke, 2008). Moreover, when sharing with others results in children receiving fewer resources themselves, children are more willing to share with friends than with nonfriends or strangers (Moore, 2009).

A tension, thus, is observed between concerns for fairness and group favoritism; several researchers have sought to explain this tension. Haidt and colleagues describe a system of morality comprised of five foundational principles, which may operate early in development; in this framework, concerns for both fairness and reciprocity *and* ingroup loyalty and favoritism are represented (Graham, Haidt, & Nosek, 2009; Haidt & Joseph, 2004; see Haidt & Kesebir, 2010; for a review). Killen and colleagues propose that children weigh considerations for fairness and justice in context with obligations that arise from social relationships or concerns for group identity and cohesion (e.g., Killen, Margie, & Sinno, 2006; Rutland, Killen, & Abrams, 2010; Smetana, Killen, & Turiel, 1991). One recent study by Fehr et al. (2008) directly tested the interaction between equality and group favoritism. Three- to 4-year-old children typically chose distributions that maximized their own winnings, whereas 7–8-year-old children were more willing to select egalitarian outcomes. With age, children were also more likely to provide more resources to children from their school than a different school. The authors propose that

tendencies toward both egalitarianism and parochialism develop in parallel during the early school years.

Given the contrast between children's allegiances to principles of fairness and group loyalty, how do children expect others to behave? Past literature has focused largely on children's own behaviors and judgments of others' actions; we know less about how children expect others to act. The current research investigates how children's expectations and evaluations compare. Do children expect people to act in egalitarian ways or to privilege the interests of their own group, and to what extent might children's expectations be informed by their beliefs about how others should behave? One possibility is that children's expectations and evaluations of others' actions will coincide. Though a tension may exist between children's preferences for egalitarianism and their ingroup favoritism, these competing influences may similarly guide their evaluations and expectations. For instance, in a situation in which children prefer egalitarian outcomes, they may use egalitarianism to guide both their evaluations and expectations of others' actions. Likewise, if a situation recruits reasoning about ingroup loyalty, such reasoning may apply for both children's evaluations and predictions of others' behaviors. Past research on children's resource distribution has not typically distinguished between expectations and evaluations in their design. As illustration, Olson and Spelke (2008) provide compelling evidence of the factors that contribute to children's beliefs about resource distribution. Participants were asked to act on behalf of a third-party protagonist (a doll) to distribute resources. Children prioritized the doll's ingroup members when allocating resources, with the exception of trials in which children were given precisely enough resources for all. Given that children were asked to act on another's behalf, it is possible that thinking about both what the protagonist *should* do and what she *would* do contributed to children's responses. From this perspective, situational cues may contribute to children's patterns of resource distribution (e.g., divide across groups when there are enough resources for everyone, prioritize ingroup members when resources are scarce), and these principles could apply to children's evaluations and expectations alike.

A second possibility is that children's evaluations and expectations might diverge. Although studies of children's expectations of others' actions are limited—and no research to date compares children's expectations and evaluations in a resource-distribution context—a few studies provide initial evidence in favor of this hypothesis. Kalish and Shiverick (2004) presented children with vignettes in which explicit rules and an actor's preferences diverged (e.g., “Johnny likes to flimmer. The rule is not to flimmer”). Children were more likely to use the rule to predict what an actor “should do” than what he or she “would do,” consistent with the possibility that young children's evaluations and predictions of an individual's actions can dissociate. Nonetheless, children's evaluations of what an actor “would do” did not differ from chance. Furthermore, in this study rules and preferences were explicitly provided to children. It is an open question whether children's evaluations and expectations will diverge when children must determine what constitutes norms or preferences—and how they relate to one another—on their own.

Research on moral reasoning provides further suggestions that children may consider different factors when evaluating versus predicting behavior. In a study of children's understanding of the magnitude of moral and conventional transgressions, Tisak and Turiel (1988) observed that school-aged children differentiated between what an actor should and would do. When given a

forced choice between a severe conventional violation and a minor moral violation, participants judged that others would choose a minor moral transgression, to avoid the social disapproval that would accompany the severe conventional transgression. Yet children nonetheless judged that others should choose a conventional transgression instead of a moral transgression, regardless of their relative magnitude, to avoid harming others. Relatedly, although preschool-age children evaluate harmful actions as violating moral obligations and thus as forbidden (e.g., Rutland et al., 2010; Smetana, 1981), they also predict that people will engage in harmful actions in contexts of intergroup competition (Rhodes, 2012). Nonetheless, we know little of how children's expectations and evaluations compare in a single paradigm that does not involve moral harm. A more general understanding of how children's expectations and evaluations compare and develop is of interest when exploring the underlying principles and developmental contexts that shape social cognition, and resource distribution provides an interesting test case of how children's expectations and evaluations compare.

The present study compares children's evaluations and expectations of others' resource distribution actions in situations where motivations for egalitarianism and group loyalty may conflict. We presented 4- to 10-year-old children with vignettes about two groups at school who compete over scarce resources, in which target individuals from each group distributed resources (cookies) to other individuals. In the *Evaluation* condition, children were asked to evaluate the targets who distributed resources. In the *Expectation* condition, children were shown the same events and were asked to judge which resource distribution scenarios were more likely to have occurred. Children in both conditions saw identical events in which no explicit rules about resource distribution were provided or violated, and we sought to test how children's expectations and evaluations of others' actions compared.

## 2. Methods

Four- to 10-year-old child participants viewed pairs of target individuals who distributed resources in different ways: Some targets distributed resources entirely to their own group, some distributed entirely to the other group, and some distributed equally across groups. Children were either asked to judge which of the two target resource distributors in each trial was “nicer” (*Evaluation* condition) or which of two distribution events “really happened” (*Expectation* condition).

### 2.1. Participants

Participants included 144 4- to 10-year-old children from the Chicago, Illinois, area (74 girls, 70 boys; mean age = 84.4 months, range = 49.3–130.5 months; 53.5% White, 11.1% African American, 5.6% Hispanic, 11.8% Asian, 18.1% other/multiracial). Forty-eight children were 4–5-year-olds (26 girls, 22 boys), 48 were 6–7-year-olds (24 girls, 24 boys), and 48 were 8–10-year-olds (24 girls, 24 boys); children in each age group were equally distributed across conditions.<sup>1</sup> Overall, parents of participants were well educated: 87.2% reported their highest level of education as a bachelor's or post-graduate degree, 4.2% associate degree/some college, 1.7% high school, 6.9% other/no response.

### 2.2. Materials

A series of images depicted a group of cartoon children dressed in either green or orange clothing. An introductory story about the “Orange Group” and the “Green Group” described the two groups competing over scarce resources at school. The story emphasized within-group cooperation and competition between groups for access to resources (see Appendix).

Test trials (presented in pairs) depicted resource distribution events involving the two groups (see Fig. 1). Each image in a pair depicted six children from each group at the top of the image and one target (the resource distributor) at the bottom. Some or all of the children held a cookie that they reportedly received from the target. The target gave out the cookies in one of three possible ways: (a) Ingroup (entirely to the target's own group), (b) Outgroup (entirely to the target's outgroup), or (c) Equal (evenly across both groups). Each image depicted distributions of either 6 or 12 cookies.

### **2.3. Procedure**

The experimenter first told children the introductory story about the two groups. Next, the experimenter placed two test trial images side-by-side in front of the child. Both images in the pair depicted a target resource distributor from the same group (Green or Orange). Each of the two images portrayed different possible resource distributions (i.e., Ingroup vs. Outgroup, Ingroup vs. Equal, Equal vs. Outgroup). During each trial, the experimenter verbalized the distribution events to supplement the static images (e.g., “this kid from the Orange Group gives his cookies to this kid, this kid, etc.”). Children were either asked to evaluate which of the two target resource distributors in each pair was “nicer” (*Evaluation* condition) or which of two resource distribution scenarios “really happened” (*Expectation* condition).

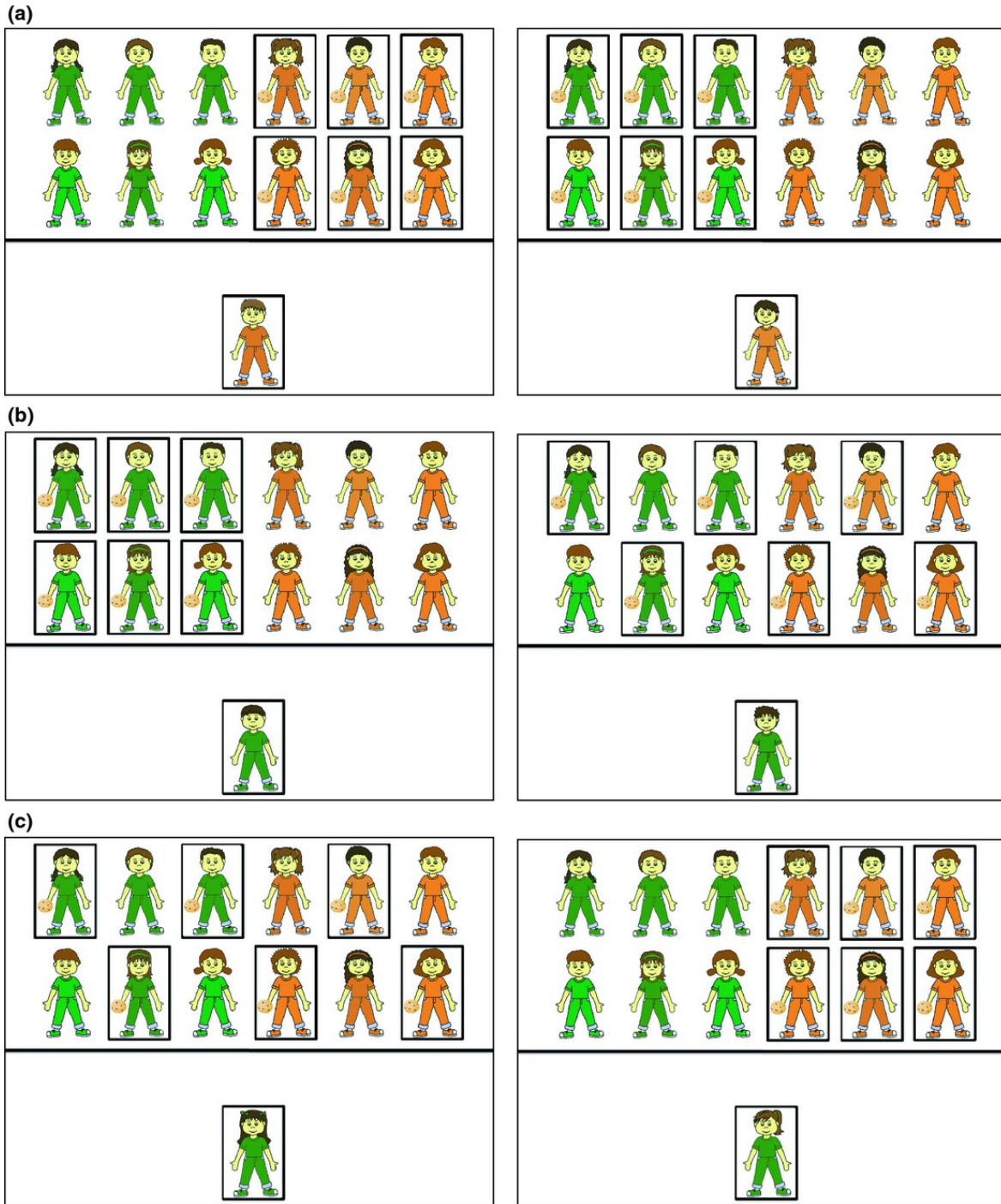
### **2.4. Design**

Children were randomly assigned to either the *Evaluation* or *Expectation* condition (with the exception of 8–10-year-olds who participated in both conditions; for these participants, condition order was counterbalanced across subjects). The order in which groups were introduced (Orange or Green first) and the number of cookies presented in each scene (6 or 12) varied between subjects.<sup>2</sup> All participants viewed all three paired comparisons (Ingroup vs. Outgroup, Ingroup vs. Equal, Equal vs. Outgroup). Each comparison was presented twice; thus, participants saw 6 total trials. Trial order was counterbalanced across participants and the lateral position of images for each test trial was counterbalanced within participants. The group membership of the targets in each trial alternated between the Orange and Green Groups.

### **2.5. Scoring**

In each pair of images, one image depicted relatively more resources distributed to ingroup members than the other image. For Ingroup versus Outgroup trials, the Ingroup image displayed more ingroup favoritism (see Fig. 1a, left); for Ingroup versus Equal trials, the Ingroup image displayed more ingroup favoritism (see Fig. 1b, left); for Equal versus Outgroup trials, the Equal image displayed more ingroup favoritism (see Fig. 1c, left). Responses in which children chose the image in the pair where the target gave more cookies to ingroup members were scored as 1

(as in Fig. 1a–c, left), whereas responses in which children chose the image where the target gave more cookies to outgroup members were scored as 0 (as in Fig. 1a–c, right). Since there were two trials of each comparison type, possible scores for each trial type ranged from 0 (maximum outgroup giving) to 2 (maximum ingroup giving).



**Figure 1.** (a) Example image of an Ingroup (1 point) versus Outgroup (0 points) trial. (b) Example image of an Ingroup (1 point) versus Equal (0 points) trial. (c) Example image of an Equal (1 point) versus Outgroup (0 points) trial.

### 3. Results

Means for each trial type are presented as the probability that children selected the option in which targets gave more resources to ingroup members. Probabilities are accompanied by Wald 95% Confidence Intervals (CIs); when the CI does not include .50 (the probability expected by chance), the obtained probability differs from the probability expected by chance (see Table 1).

**Table 1.** Mean proportions and confidence intervals for children's responses to each trial type, divided by age group

<i>Evaluation Condition</i>	<b>Overall</b>	<b>4–5 years</b>	<b>6–7 years</b>	<b>8–10 years</b>
Ingroup (1) versus Outgroup (0)	.19 (.11, .27)*	.40 (.26, .54)	.15 (.05, .25)*	.02 (-.02, .06)*
Ingroup (1) versus Equal (0)	.14 (.07, .22)*	.38 (.25, .51)	.04 (-.01, .10)*	.00 (.00, .00)*
Equal (1) versus Outgroup (0)	.71 (.62, .81)*	.60 (.46, .74)	.73 (.60, .85)*	.81 (.70, .92)*
<i>Expectation Condition</i>	<b>Overall</b>	<b>4–5 years</b>	<b>6–7 years</b>	<b>8–10 years</b>
Ingroup (1) versus Outgroup (0)	.71 (.62, .80)*	.57 (.42, .71)	.69 (.56, .71)*	.88 (.78, .97)*
Ingroup (1) versus Equal (0)	.61 (.51, .70)*	.41 (.27, .56)	.58 (.44, .72)	.81 (.70, .92)*
Equal (1) versus Outgroup (0)	.69 (.60, .78)*	.57 (.42, .71)	.73 (.60, .85)*	.77 (.65, .89)*

Notes: Points allotted for each selection (e.g., Ingroup vs. Outgroup) are noted in parentheses. Proportions that are significantly different from chance (95% Wald Confidence Interval does not contain .50) are marked with an asterisk.

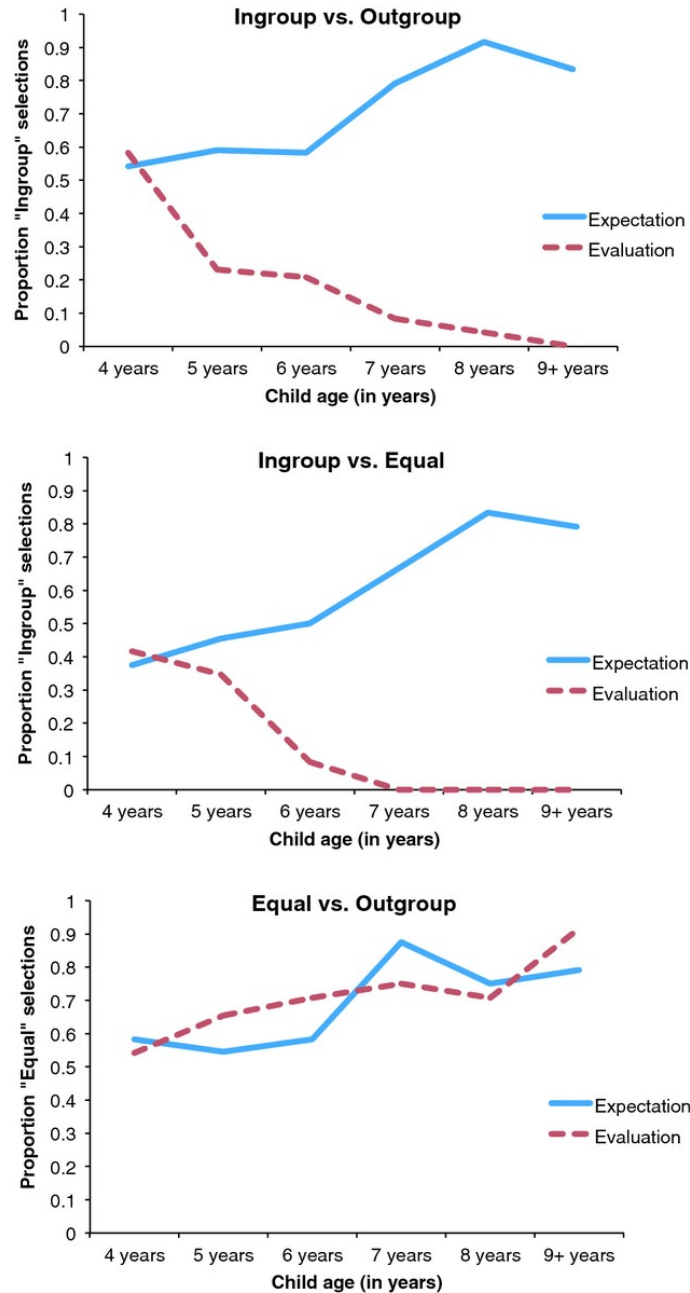
To compare results across conditions, children's scores were modeled using a generalized linear model for each comparison type, with a binomial probability distribution and a logit link function (since participants made a binary choice for each trial). Condition (*Evaluation* vs. *Expectation*) was entered as a categorical variable; Age (in months) was entered as a continuous variable. Analyses tested for main effects of each variable and an interaction, and yield Wald Chi-Square values as indicators of significant effects. To facilitate comparisons with past research (e.g., Dunham et al., 2011; Rhodes, 2012), Cohen's *d* values are reported as a measure of effect size.

Although some studies have found effects of gender and birth order on children's judgments about fairness (e.g., Fehr et al., 2008), preliminary analyses did not reveal any effects of either factor. Therefore, the following analyses collapse across gender and birth order.

#### 3.1. Ingroup versus Outgroup trials

When children were presented with a choice between targets who gave all their resources to their own group and targets who gave all their resources to their outgroup, children expected targets to

favor their ingroup (*Expectation* condition:  $M_{\text{Ingroup}} = .71$ ,  $CI = .62, .80$ ) but evaluated favoring the outgroup as “nicer” (*Evaluation* condition:  $M_{\text{Ingroup}} = .19$ ,  $CI = .11, .27$ ; main effect of Condition, Wald  $\chi^2(1) = 16.4$ ,  $p < .001$ ,  $d = 0.68$ ). This pattern became increasingly divergent with age (Condition  $\times$  Age interaction, Wald  $\chi^2(1) = 29.8$ ,  $p < .001$ ,  $d = .93$ ; Fig. 2, top); Age was negatively correlated with selecting ingroup scenarios in the *Evaluation* condition,  $r = -.48$ ,  $p < .001$ , but positively correlated with selecting ingroup scenarios in the *Expectation* condition,  $r = .36$ ,  $p = .002$ . Selections of ingroup scenarios also declined with age overall (main effect of Age, Wald  $\chi^2(1) = 4.19$ ,  $p = .04$ ,  $d = .55$ ). Thus, for these items, children's expectations and evaluations diverged.



**Figure 2.** Results for the *Evaluation* and *Expectation* conditions by trial type and age (in years).



### 3.2. Ingroup versus Equal trials

When children saw a contrast between targets who gave all their resources to their own group and targets who distributed resources evenly across both groups, children again expected targets to provide more resources to ingroup members (*Expectation* condition:  $M_{\text{Ingroup}} = .61$ ,  $CI = .51, .70$ ) yet evaluated egalitarian distributions as “nicer” (*Evaluation* condition:  $M_{\text{Ingroup}} = .14$ ,  $CI = .07, .22$ ; main effect of Condition, Wald  $\chi^2(1) = 20.1$ ,  $p < .001$ ,  $d = 0.76$ ). Children's responses diverged with age (Condition  $\times$  Age interaction, Wald  $\chi^2(1) = 28.8$ ,  $p < .001$ ,  $d = .91$ ); again, Age was negatively correlated with selections that depicted ingroup favoritism in the *Evaluation* condition,  $r = -.42$ ,  $p = .003$ , but was positively correlated in the *Expectation* condition,  $r = .41$ ,  $p < .001$  (see Fig. 2, center). Overall, children's selections of ingroup scenarios declined with Age (main effect of Age, Wald  $\chi^2(1) = 5.43$ ,  $p = .02$ ,  $d = .66$ ). As above, children positively evaluated individuals who exhibited less ingroup favoritism and distributed cookies to both groups, yet they expected others to prioritize their own group.

### 3.3. Equal versus Outgroup trials

When children viewed a contrast between targets who gave their resources equally to both groups and those who distributed all their resources to the outgroup, we find similar results across conditions: Children expected targets to distribute cookies equally across groups and also evaluated them as “nicer” (*Expectation*:  $M_{\text{Equal}} = .69$ ,  $CI = .60, .78$ ; *Evaluation*:  $M_{\text{Equal}} = .71$ ,  $CI = .62, .81$ ). In both conditions, the extent to which children endorsed equal distributions also increased with age (*Evaluation*:  $r = .26$ ,  $p = .025$ ; *Expectation*:  $r = .22$ ,  $p = .066$ ; main effect of Age, Wald  $\chi^2(1) = 12.0$ ,  $p < .001$ ,  $d = .36$ ). Here, children's responses converged across conditions, suggesting that children view it as nice and also more likely for individuals to give equally (rather than prioritizing the outgroup; see Fig. 2, bottom).

### 3.4. Control conditions

While children's evaluations and expectations appear to be diverging with age, it is also possible that our youngest sample of children did not understand the task presented. To test younger children's comprehension of the scenario outside of a resource distribution context, we presented a separate group of 24 4- and 5-year-olds with the same stimuli and asked them to make predictions about who an individual from a particular group would most likely befriend (the *Friendship* condition). Children heard the same introductory story about intragroup cooperation and intergroup competition and viewed the same stimuli described above with two exceptions: (a) All cookies were removed from the images and (b) instead of displaying a target child at the bottom of each picture (see Fig. 1), children were shown one target child from either the Orange Group or the Green Group. Children were asked which image in each pair (Ingroup vs. Outgroup; Ingroup vs. Equal; Equal vs. Outgroup) depicted the target child's friends. As in the first study, children saw six trials (two of each contrast). We collapsed across trial types to calculate the overall probability that 4–5-year-olds would select ingroup-favoring scenarios as the most likely depictions of friendship. Children were more likely to select the image depicting comparatively more ingroup members than would be expected by chance ( $M_{\text{Ingroup}} = .68$ ,  $CI = .60, .76$ ). Children were also more likely to select ingroup-favoring scenarios

in the *Friendship* condition than in either the *Expectation* or *Evaluation* conditions. A binomial logistic regression model revealed a significant effect of Condition when comparing the *Friendship* condition to the *Expectation* condition (Wald  $\chi^2(1) = 8.00, p = .005, d = .84$ ) and the *Evaluation* condition (Wald  $\chi^2(1) = 14.3, p < .001, d = 1.10$ ). These results suggest that the youngest children were not unable to comprehend the introductory story, understand the requirements of this task, or make systematic predictions. Instead, their specific expectations and evaluations of resource distribution events in the context of intergroup competition appear to change with age.

Another potential limitation of the current study is that “nice” is a general descriptor that could refer broadly to the character of the individuals, their desirability as potential friends, or to the quality of a single action. “Nice” may also be highly socially constructed: Children may be taught at home or at school that it is “nice” to share with everyone. To assess whether the results in the *Evaluation* condition generalize beyond evaluations of who is “nice,” we tested a separate group of 72 4- to 10-year-olds in a second *Evaluation* condition with the same materials, procedure, and design but a different test prompt: Who “did the right thing?” This question was selected in light of past research asking children to assess whether an action was “right” or “all right” versus “not all right” and notes children using “right” and “wrong” in their own moral judgments (e.g., Killen, Mulvey, Richardson, Jampol, & Woodward, 2011; Kohlberg, 1963/2008; Piaget, 1932/1997). Re-computing the analyses presented above to compare children tested in the *Expectation* condition with those tested in the second *Evaluation* condition (“right”), we again observed children's expectations and evaluations diverged with age. Analyses revealed the same patterns of results as reported above: For Ingroup versus Outgroup and Ingroup versus Equal trials, we found a significant effect of Condition (Ingroup vs. Outgroup:  $\chi^2(1) = 13.7, p < .001, d = 0.63$ ; Ingroup vs. Equal:  $\chi^2(1) = 11.3, p = .001, d = 0.57$ ) and a Condition by Age interaction ( $\chi^2(1) = 26.8, p < .001, d = 0.88$ ;  $\chi^2(1) = 22.3, p < .001, d = 0.81$ ). For Equal versus Outgroup trials, we found only a significant effect of Age,  $\chi^2(1) = 9.61, p = .002, d = 0.37$ . Thus, the observation that children's expectations and evaluations diverge with age generalizes to broader evaluative contexts.

#### 4. Discussion

These findings provide evidence that children's expectations and evaluations of others' behaviors diverge in the context of competition over scarce resources. Though all children viewed the same events of individuals from competing groups distributing resources to members of their ingroup, their outgroup, or equally to both groups, children's responses across conditions differed dramatically. Participants assigned to the *Evaluation* condition expressed a preference for egalitarianism. When asked which resource distributor was “nicer,” children chose the one who shared across groups. These evaluations were markedly different from children's responses in the *Expectation* condition. When asked which event “really happened,” children predicted that resource distributors would favor their own group. These data provide evidence that although children express a clear intuition that it is *nicer* to be egalitarian, they do not think that this is how people actually behave in competitive situations. As one child commented, “people don't do that for real.”

This finding of a divergence in children's expectations and evaluations of others' actions is of particular interest given how compelling the counter-hypothesis was: Namely, that children's expectations of others actions might harness beliefs about what the actors *should do*, or vice-versa. Moreover, although past research has revealed a tension between children's preferences for egalitarianism and their ingroup favoritism, it seemed plausible to reason that these competing influences might have similar consequences for both evaluations and for expectations. For instance, in a situation in which children prefer egalitarian outcomes, they may use egalitarianism to guide both their evaluations and expectations of others' actions, and situations that recruit reasoning about ingroup loyalty might do so for both children's evaluations and predictions of others' behaviors. In contrast, the current findings provide clear evidence that children's evaluations and expectations do not uniformly operate in parallel, and they may recruit different underlying principles and evidence.

We also observed that divergences in children's responses across the *Expectation* and *Evaluation* conditions increased with age: From ages 4–10, children's stated preferences for egalitarianism and their expectations that others would not behave in egalitarian ways increased. Open questions concern the mechanism underlying the observed developmental trajectory, and whether children's reasoning about evaluations and expectations necessarily follow an analogous developmental time course. Interestingly, children's reasoning in a potentially related domain follows a similar developmental trajectory. Children's skepticism about others' statements of self-promotion seems to undergo a similar transition between the ages of 4 and 10; older children are more likely than younger children to consider another's self-interested motives and acknowledge the possibility that others might lie or engage in self-aggrandizing reporting of valued traits (Heyman, Fu, & Lee, 2007; Mills & Keil, 2005). Children tested by Heyman et al. (2007) were increasingly likely with age to suggest that others might exaggerate the extent to which they possess highly valued traits (e.g., honesty, intelligence, niceness) which may confer important social benefits, but they did not expect the same inflation for traits that seemed unlikely to elevate an individual's social standing (e.g., color preferences). With age, children may develop a more complex view of others' actions and motivations, in which they acknowledge actors' actions can harness intentions that are not necessarily “pure.” Nonetheless, it is also important to note that in the current design, our task may be best suited to assess the views of older children, and perhaps more sophisticated experimental methods would reveal divergences between children's expectations and evaluations at even earlier ages. Although our control Friendship condition with 4- and 5-year-olds suggests that children of this age are generally capable of reasoning about the implications of group membership when tested on a very similar task, thinking about resource distribution may be more demanding. Methods that provide younger children with firsthand experience receiving resources or collaborating with others to obtain resources have proven successful with children as young as 3 years of age (Baumard et al., 2012; LoBue et al., 2011; Warneken et al., 2011) and could contribute to profitable future research.

Several additional open questions result from these findings. First, future research might investigate whether the compositions or identities of the groups in competition might influence children's inferences about resource distribution. What if instead of groups at school, the presented groups were formed on the basis of gender, language, or community lines? What if one group constituted a numerical majority or was higher in social status? It seems conceivable that

children's expectations of others' actions within and across group lines may differ depending on the social identities of the groups. Some types of groups (e.g., those formed based on language or gender; Kinzler, Shutts, DeJesus, & Spelke, 2009; Rhodes & Gelman, 2009) may be more salient to young children than others. Likewise, children may have asymmetric expectations about how individuals who are high or low in prestige may interact (Henrich & Gil-White, 2001). The scenarios described to children tested here were explicitly about intergroup competition; children may draw similar conclusions about naturally occurring groups without explicit mention of competition, yet the possibility remains that these findings are unique to situations of competition over scarce resources.

Second, we might investigate the impact of children's *own* group membership on their reasoning about others' distribution of resources. In this study, children were third-party observers of the events depicted. How might children's evaluations change if they became members of either the Orange or Green Group? It is possible that children's evaluations might appeal to concerns for group loyalty, rather than to egalitarianism, if children were members of one of the presented groups (e.g., Graham et al., 2009; Haidt & Joseph, 2004; Haidt & Kesebir, 2010; Olson & Spelke, 2008). If members of one of the groups themselves, children might positively evaluate individuals who distribute more resources to ingroup members and *also* expect group members to act in ways that demonstrate their loyalty to the group.

Finally, critical open questions concern how differences in cultural context might impact the pattern of results presented here. We tested children living in a major, urban, largely politically liberal city in the United States. How might children living in diverse areas of the United States or other countries compare to the children tested here? Research with adults suggests that adherence to norms of ingroup loyalty differs based on cultural and political context (Graham et al., 2009), and that a variety of demographic factors (e.g., community size, economic and religious participation) influence adults' and children's behavior in economics games (Henrich et al., 2010; Henrich, Heine, & Norenzayan, 2010; Rochat et al., 2009). The origins and development of children's divergent evaluations and expectations for egalitarian versus ingroup-serving actions might similarly be a case where cross-cultural research would be fruitful.

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## **Notes**

1. The same 8–10-year-old children participated in both conditions. Condition order was counterbalanced across participants.
2. We included two options for number of resources (6 vs. 12 cookies) to consider the possibility that children might only exhibit ingroup favoritism in situations of scarcity (see Moore, 2009). However, children's selections did not reliably differ based on the total number of cookies they saw, so analyses collapsed across number of cookies.

## References

- Baumard, N., Mascaro, O., & Chevallier, C. (2012). Preschoolers are able to take merit into account when distributing goods. *Developmental Psychology*, **48**(2), 492–498. doi:[10.1037/a0026598](https://doi.org/10.1037/a0026598). [Crossref](#) [Web of Science®](#) [Google Scholar](#)
- Bernhard, H., Fischbacher, U., & Fehr, E. (2006). Parochial altruism in humans. *Nature*, **442**, 912–915. doi:[10.1038/nature04981](https://doi.org/10.1038/nature04981). [Crossref](#) [CAS](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)
- Bigler, B. S., Jones, L. C., & Lobliner, D. B. (1997). Social categorization and the formation of intergroup attitudes in children. *Child Development*, **68**(3), 530–543. doi:[10.2307/1131676](https://doi.org/10.2307/1131676). [Crossref](#) [CAS](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)
- Birch, L. L., & Billman, J. (1986). Preschool children's food sharing with friends and acquaintances. *Child Development*, **57**(2), 387–395. doi:[10.2307/1130594](https://doi.org/10.2307/1130594). [Crossref](#) [Web of Science®](#) [Google Scholar](#)
- Blake, P. R., & McAuliffe, K. (2011). “I had so much it didn't seem fair”: Eight-year-olds reject two forms of inequity. *Cognition*, **120**, 215–224. doi:[10.1016/j.cognition.2011.04.006](https://doi.org/10.1016/j.cognition.2011.04.006). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)
- Damon, W. (1977). *The social world of the child*. San Francisco: Jossey-Bass. [Google Scholar](#)
- Dunham, Y., Baron, A. S., & Carey, S. (2011). Consequences of “minimal” group affiliations in childhood. *Child Development*, **82**(3), 793–811. doi:[10.1111/j.1467-8624.2011.01577.x](https://doi.org/10.1111/j.1467-8624.2011.01577.x). [Wiley OnlineLibrary](#) [Web of Science®](#) [Google Scholar](#)
- Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in young children. *Nature*, **454**, 1079–1084. doi:[10.1038/nature07155](https://doi.org/10.1038/nature07155). [Crossref](#) [CAS](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)
- Geraci, A., & Surian, L. (2011). The developmental roots of fairness: Infants' reactions to equal and unequal distributions of resources. *Developmental Science*, **14**, 1012–1020. doi:[10.1111/j.1467-7687.2011.01048.x](https://doi.org/10.1111/j.1467-7687.2011.01048.x). [Wiley Online Library](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)
- Goette, L., Huffman, D., & Meier, S. (2006). The impact of group membership on cooperation and norm enforcement: Evidence using random assignment to real social groups. *The American Economic Review*, **96**(2), 212–216. [Crossref](#) [Web of Science®](#) [Google Scholar](#)
- Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology*, **96**(5), 1029–1046. doi:[10.1037/a0015141](https://doi.org/10.1037/a0015141). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)
- Gummerum, M., Hanoch, Y., Keller, M., Parsons, K., & Hummel, A. (2010). Preschoolers' allocations in the dictator game: The role of moral emotions. *Journal of Economic*

*Psychology*, **31**, 25–34. doi:[10.1016/j.joep.2009.09.002](https://doi.org/10.1016/j.joep.2009.09.002). [Crossref](#) [Web of Science®](#) [Google Scholar](#)

Haidt, J., & Joseph, C. (2004 Fall). Intuitive ethics: How innately prepared intuitions generate culturally variable virtues. *Daedalus*, **55–66**, doi:[10.1162/0011526042365555](https://doi.org/10.1162/0011526042365555). [Crossref](#) [Google Scholar](#)

Haidt, J., & Kesebir, S. (2010). Morality. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (5th ed). Vol. **3**. Hoboken, NJ: John Wiley & Sons, Inc. [Google Scholar](#)

Harbaugh, W. T., & Krause, K. (2000). Children's altruism in public good and dictator experiments. *Economic Inquiry*, **38**, 95–109. doi:[10.1111/j.1465-7295.2000.tb00006.x](https://doi.org/10.1111/j.1465-7295.2000.tb00006.x). [Wiley Online Library](#) [Web of Science®](#) [Google Scholar](#)

Henrich, J., Ensminger, J., McElreath, R., Barr, A., Barrett, C., Bolyanatz, A., Cardenas, J. C., Gurven, M., Gwako, E., Henrich, N., Lesorogal, C., Marlowe, F., Tracer, D., & Ziker, J. (2010). Markets, religion, community size, and the evolution of fairness. *Science*, **327**, 1480–1484. doi:[10.1126/science.1182238](https://doi.org/10.1126/science.1182238). [Crossref](#) [CAS](#) [Web of Science®](#) [Google Scholar](#)

Henrich, J., & Gil-White, F. J. (2001). The evolution of prestige: Freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evolution and Human Behavior*, **22**, 165–196. doi:[10.1016/S1090-5138\(00\)00071-4](https://doi.org/10.1016/S1090-5138(00)00071-4). [Crossref](#) [CAS](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, **33**(2–3), 61–83. doi:[10.1017/S0140525X0999152X](https://doi.org/10.1017/S0140525X0999152X). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)

Heyman, G. D., Fu, G., & Lee, K. (2007). Evaluating claims people make about themselves: The development of skepticism. *Child Development*, **78**(2), 367–375. doi:[10.1111/j.1467-8624.2007.01003.x](https://doi.org/10.1111/j.1467-8624.2007.01003.x). [Wiley Online Library](#) [Web of Science®](#) [Google Scholar](#)

Kalish, C. W., & Shiverick, S. M. (2004). Children's reasoning about norms and traits as motives for behavior. *Cognitive Development*, **19**, 401–416. doi:[10.1016/j.cogdev.2004.05.004](https://doi.org/10.1016/j.cogdev.2004.05.004). [Crossref](#) [Web of Science®](#) [Google Scholar](#)

Killen, M., Margie, N. G., & Sinno, S. (2006). Morality in the context of intergroup relationships. In M. Killen, & J. G. Smetana (Eds.), *Handbook of moral development* (pp. 155–183). Mahway, NJ: Lawrence Erlbaum Associates. [Google Scholar](#)

Killen, M., Mulvey, K. L., Richardson, C., Jampol, N., & Woodward, A. (2011). The accidental transgressor: Morally relevant theory of mind. *Cognition*, **119**(2), 197–215. doi:[10.1016/j.cognition.2011.01.006](https://doi.org/10.1016/j.cognition.2011.01.006). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)

Kinzler, K. D., Shutts, K., DeJesus, J., & Spelke, E. S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition*, **27**(4), 623–634. doi:[10.1521/soco.2009.27.4.623](https://doi.org/10.1521/soco.2009.27.4.623). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)

Kohlberg, L. (2008). The development of children's orientations toward a moral order. *Human Development*, **51**, 8–20 (Original work published 1963). doi: [10.1159/000112530](https://doi.org/10.1159/000112530) [Crossref](#) [Web of Science®](#) [Google Scholar](#)

Lane, I. M., & Coon, R. C. (1972). Reward allocation in preschool children. *Child Development*, **43**, 1382–1389. doi:[10.2307/1127523](https://doi.org/10.2307/1127523). [Crossref](#) [Web of Science®](#) [Google Scholar](#)

LoBue, V., Nishida, T., Chiong, C., DeLoache, J. S., & Haidt, J. (2011). When getting something good is bad: Even three-year-olds react to inequality. *Social Development*, **20**(1), 154–170. doi:[10.1111/j.1467-9507.2009.00560.x](https://doi.org/10.1111/j.1467-9507.2009.00560.x). [Wiley Online Library](#) [Web of Science®](#) [Google Scholar](#)

Mills, C. M., & Keil, F. C. (2005). The development of cynicism. *Psychological Science*, **16**(5), 385–390. doi:[10.1111/j.0956-7976.2005.01545.x](https://doi.org/10.1111/j.0956-7976.2005.01545.x). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)

Moore, C. (2009). Fairness in children's resource allocation depends on the recipient. *Psychological Science*, **20**(8), 944–948. doi:[10.1111/j.1467-9280.2009.02378.x](https://doi.org/10.1111/j.1467-9280.2009.02378.x). [Crossref](#) [Web of Science®](#) [Google Scholar](#)

Olson, K. R., & Spelke, E. S. (2008). Foundations of cooperation in young children. *Cognition*, **108**, 222–231. doi:[10.1016/j.cognition.2007.12.003](https://doi.org/10.1016/j.cognition.2007.12.003). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)

Piaget, J. (1997). *The moral judgment of the child*. New York: Free Press Paperbacks (Original work published 1932). [Google Scholar](#)

Rhodes, M. (2012). Naïve theories of social groups. *Child Development*, **83**(6), 1900–1916. [Wiley Online Library](#) [Web of Science®](#) [Google Scholar](#)

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**(3), 244–274. doi:[10.1016/j.cogpsych.2009.05.001](https://doi.org/10.1016/j.cogpsych.2009.05.001). [Crossref](#) [PubMed](#) [Web of Science®](#) [Google Scholar](#)

Rochat, P., Dias, M. D. G., Liping, G., Broesch, T., Passos-Ferreira, C., Winning, A., & Berg, B. (2009). Fairness in distributive justice by 3- and 5-year-olds across seven cultures. *Journal of Cross-Cultural Psychology*, **40**, 416–442. doi:[10.1177/0022022109332844](https://doi.org/10.1177/0022022109332844). [Crossref](#) [Web of Science®](#) [Google Scholar](#)

Rutland, A., Killen, M., & Abrams, D. (2010). A new social-cognitive developmental perspective on prejudice: The interplay between morality and group identity. *Perspectives on*

*Psychological Science*, **5**(3), 279–291. doi:[10.1177/1745691610369468](https://doi.org/10.1177/1745691610369468). [Crossref Web of Science®](#) [Google Scholar](#)

Schmidt, M. F. H., & Sommerville, J. A. (2011). Fairness expectations and altruistic sharing in 15-month-old human infants. *PLoS ONE*, **6**(10), e23223. doi:[10.1371/journal.pone.0023223](https://doi.org/10.1371/journal.pone.0023223). [Crossref CAS PubMed Web of Science®](#) [Google Scholar](#)

Sloane, S., Baillargeon, R., & Premack, D. (2012). Do infants have a sense of fairness? *Psychological Science*, **23**(2), 196–204. doi:[10.1177/0956797611422072](https://doi.org/10.1177/0956797611422072). [Crossref PubMed Web of Science®](#) [Google Scholar](#)

Smetana, J. G. (1981). Preschool children's conceptions of moral and social rules. *Child Development*, **52**(4), 1333–1336. doi:[10.2307/1129527](https://doi.org/10.2307/1129527). [Crossref Web of Science®](#) [Google Scholar](#)

Smetana, J. G., Killen, M., & Turiel, E. (1991). Children's reasoning about interpersonal and moral conflicts. *Child Development*, **62**, 629–644. doi:[10.2307/1131136](https://doi.org/10.2307/1131136). [Wiley Online Library Web of Science®](#) [Google Scholar](#)

Smith, C. E., Blake, P. R., & Harris, P. L. (2013). I should but I won't: Why young children endorse norms of fair sharing but do not follow them. *PLoS ONE*, **8**(3), e59510. doi:[10.1371/journal.pone.0059510](https://doi.org/10.1371/journal.pone.0059510). [Crossref CAS PubMed Web of Science®](#) [Google Scholar](#)

Sutter, M. (2007). Outcome versus intentions: On the nature of fair behavior and its development with age. *Journal of Economic Psychology*, **28**, 69–78. doi:[10.1016/j.joep.2006.09.001](https://doi.org/10.1016/j.joep.2006.09.001). [Crossref Web of Science®](#) [Google Scholar](#)

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, **1**(2), 149–178. doi:[10.1002/ejsp.2420010202](https://doi.org/10.1002/ejsp.2420010202). [Wiley Online Library Web of Science®](#) [Google Scholar](#)

Tisak, M. S., & Turiel, E. (1988). Variation in seriousness of transgressions and children's moral and conventional concepts. *Developmental Psychology*, **24**(3), 352–357. doi:[10.1037/0012-1649.24.3.352](https://doi.org/10.1037/0012-1649.24.3.352). [Crossref Web of Science®](#) [Google Scholar](#)

Warneken, F., Lohse, K., Melis, A. P., & Tomasello, M. (2011). Young children share the spoils after collaboration. *Psychological Science*, **22**(2), 267–273. doi:[10.1177/0956797610395392](https://doi.org/10.1177/0956797610395392). [Crossref Web of Science®](#) [Google Scholar](#)

## Appendix

**Full text of introductory script:**



Here is the Green Group. They are a group of kids who all like the same games, all play together, help each other out and are all friends. They all like to wear green, and they call themselves the Green Group.

Here is the Orange Group. They are a different group of kids who all like the same games, all play together, help each other out and are all friends. They all like to wear orange, and they call themselves the Orange Group.

The Green Group and the Orange Group are always competing to get the best things.

On the playground, there aren't enough of the best games to go around. Here, there aren't enough swings for everyone, and the Green Group and the Orange Group both want to play on them.

At recess, the Green Group and Orange Group always compete against each other. They always want their team to win the game.

At story time, there aren't enough of the best seats for everyone. Everyone wants to sit in a fun chair, but there aren't enough for everyone in the Green Group and the Orange Group.

In the classroom, they always want their own group to line up first. The Green Group and Orange Group both want to be the best group at school!

Now, we're going to meet some more kids from the Green group and Orange group, who can give out cookies to the other kids.