Original Article

The Development of Children's Egalitarianism in the Context of Group Membership and Resource Valence

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Abstract: Children's motivation for the egalitarian allocation of resources is reflected in their allocation of positive and negative resources between themselves and others. In the present study, 6- ($n = 29$) and 8-year-olds ($n = 25$) could choose between different allocations of positive and negative resources to themselves and others in a series of games. The other player was either an ingroup member or an outgroup member. Results revealed that, overall and irrespective of resource valence, 8-year-olds were more likely to choose an egalitarian allocation of resources than 6-year-olds. 8-year-olds also shared more positive resources with the outgroup member than 6-year-olds. Children's egalitarianism is discussed in light of theories of prosocial development.

Keywords: egalitarianism, resource valence, children, sharing, ingroup bias

Die Entwicklung von Egalitarismus bei Kindern im Kontext von Gruppenzugehörigkeit und Ressourcenvalenz

Zusammenfassung: Die Motivation von Kindern, Ressourcen egalitär zu verteilen zeigt sich bei der Verteilung von positiven wie auch negativen Ressourcen zwischen sich selbst und anderen. In dieser Studie konnten 6- ($n = 29$) und 8-Jährige ($n = 25$) zwischen verschiedenen Verteilungen von positiven und negativen Ressourcen zwischen sich selbst und einem anderen Kind in einer Reihe von Spielen entscheiden. Das andere Kind war entweder ein Mitglied der Eigengruppe oder ein Mitglied einer Fremdgruppe. Als Ergebnis zeigte sich, dass 8-Jährige häufiger als 6-Jährige unabhängig von der Valenz der Ressource eine Gleichverteilung wählten. Des Weiteren teilten die 8-Jährigen häufiger als 6-Jährige positive Ressourcen egalitär zwischen sich und dem Kind der Fremdgruppe auf. Dieser Egalitarismus bei Kindern wird vor dem Hintergrund von Theorien zur Entwicklung prosozialen Verhaltens diskutiert.

Schlüsselwörter: Egalitarismus, Ressourcenvalenz, Kinder, Teilen, Eigengruppenpräferenz

For human societies to function their members must care about the well-being of others. One way of putting this attitude into action is to avoid inequalities between individuals (Fehr et al., 2008, 2013). This so-called *egalitarianism* is the intermediate position between egoism (i.e., favoring one's own well-being over the other's well-being) and altruism (i.e., favoring the other's well-being over one's own well-being). Egalitarianism can be achieved by showing prosocial behavior, which is an umbrella term for a variety of actions that benefit another person, for example, helping, comforting, sharing, and cooperation (Batson & Powell, 2003). When tracking the development of egalitarianism, many studies have investigated sharing not only because it is easy to measure, but also because the distribution of resources is a prominent topic in young children's everyday life. However, resource allocation can occur along with a variety of criteria. Sometimes, children might have to decide who receives desirable and, at other times, undesirable items. Sometimes, children need to share with persons who are members of their own group and sometimes with members of an outgroup. In the past, research has focused on studying the role of a single influence on sharing behavior, for example, membership of the person to share with (e.g., Fehr et al., 2008) or valence of the resource to be shared (e.g., Kenward & Östh, 2015). To capture the allocation of resources in a setting that is more akin to the complexities of children's daily life, the interaction of different factors needs to be studied. In the present study, we tested the role of the recipient's group membership

and resource valence for 6- and 8-year-old children's distribution of resources in different games in which the own share either was or was not affected by the participants' decisions.

Sharing positive resources in the first years of life depends on a variety of factors, such as characteristics of the recipient (e.g., familiarity), of the situation (e.g., presence of the recipient), or of the person who allocates resources (for a review, see Martin & Olson, 2015).

Another important factor is age. Children's motivation to share positive resources (e.g., candy) in an egalitarian way (i.e., equal payoffs for the child and their counterpart) increases with age (Fehr et al., 2008, 2013; Kogut, 2012; Malti et al., 2012; Sheskin et al., 2014; Smith et al., 2013). In a seminal study with 3–8-year-olds (Fehr et al., 2008), children could choose between an egalitarian allocation of positive resources (i.e., 1:1 that is, one piece of candy for themselves – one for the other child) and, depending on the specific game, one of three different unequal distributions in three different games (prosocial game: 1:0 that is, one for themselves and none for the other person; sharing game: 2:0 that is, two for themselves and none for the other person; envy game: 1:2 that is, one for themselves and two for the other person). Across games, children became more likely to select the egalitarian allocation with increasing age (see Blake et al., 2015, for cross-cultural evidence of this development). While the existence of age differences in egalitarianism is well-established in the context of positive resources, with older children being more egalitarian, it is unclear whether these age differences are also present when children distribute negative resources.

The nature of the resources is a critical element in resource distributions. Some studies have investigated the sharing of luxurious and basic resources (Rizzo et al., 2016) that depended on the other person's previous behavior (e.g., Smith & Warneken, 2016; Wörle & Paulus, 2018). As a rare exception, Kenward and Östh's (2015) study investigated the allocation of inherently negative resources (i.e., disgusting-tasting fake sweets). The use of negative resources bears the question of whether children also accept receiving a negative resource to spare another person.

This form of self-sacrifice usually manifests itself in undertaking the task of doing unpleasant tasks for the sake of the community. In childhood, it might be tidying up the playroom when other children have played in it; in adulthood, it might be becoming a volunteer firefighter. In both cases, the individual makes sacrifices regarding their own well-being for the sake of the others' well-being. This behavior can be described as altruistic because it benefits another individual who is not closely related, while being obviously detrimental to the individual performing the

behavior (Trivers, 1971). Although giving a positive resource is also an altruistic behavior, receiving negative resources allows investigating egalitarianism under more challenging conditions (Böhm & Buttelmann, 2017). Since voluntary self-sacrifice is vital for societies to function, it is also important to investigate the developmental course of this phenomenon.

Most studies have operationalized self-sacrifice by allocating negative resources to oneself (e.g., a moldy slice of toast; Böhm & Buttelmann, 2017). Using tasks in which children could allocate resources between themselves and another individual, the results of a recent study showed that children are sometimes willing to accept negative resources to spare another individual from receiving this resource (Böhm & Buttelmann, 2017). In this study, 6- and 8-year-old children received two resources that were either positive or negative and were allowed to allocate both, one, or neither of them to another individual; the remaining resources stayed with the children themselves. For both positive and negative resources, selfish allocations (2:0 for positive and 0:2 for negative resources) outweighed altruistic allocations (0:2 for positive and 2:0 for negative resources), while around one-third to two-thirds of children chose an egalitarian allocation (1:1). The study exemplified that children's prosocial motivation involves both sharing benefits and sharing defects. However, these results on egalitarianism refer only to the situation in which children distributed two resources between themselves and another individual such that both their own and the other individual's share was determined by their choices. However, in some studies with positive resources, children could influence the outcome only for the coplayer but not for themselves (and vice versa, Fehr et al., 2008). It is an open question how children allocate negative resources in situations in which their own share is not affected.

Societies are characterized not only by cooperation among their members, but also by conflicts with other societies (Esteban et al., 2012). This societal phenomenon is grounded in individual interactions. People tend to act more prosocially and less antisocially when dealing with members of their own group as compared to members of another group (Tajfel, 1978). This asymmetry in social motivation has been labeled as "ingroup–outgroup bias." Early in ontogeny, infants distinguish between ingroup and outgroup members in terms of visual (Kinzler et al., 2007) and imitative preference (Buttelmann et al., 2013). Group membership also influences children's liking of others (Kinzler et al., 2007). In studies on early ingroup–outgroup bias, an individual's group membership is typically indicated by their language (i.e., speaking either the participating child's native language or a language foreign to the child). However, children also show this

bias in the minimal-group paradigm, in which group membership is indicated by arbitrary characteristics such as the color of the T-shirt a person is wearing (Dunham et al., 2011).

The ingroup–outgroup bias affects children's allocation of positive resources: Children allocate more positive resources to ingroup members than to outgroup members (Buttelmann & Böhm, 2014; Moore, 2009). Again, in the context of allocating resources, this bias has been predominantly investigated for sharing positive resources. Only two studies investigated the influence of group membership on allocating positive *and* negative resources. Here, 6- and 8-year-old children showed ingroup favoritism when they distributed positive resources between an ingroup and an outgroup member (Buttelmann & Böhm, 2014), and when they distributed positive resources between themselves and an ingroup or an outgroup member (Böhm & Buttelmann, 2017). In contrast, only 8-year-olds – but not 6-year-olds – showed outgroup degradation when they allocated negative resources (e.g., moldy toast) based on an individual's group membership. That is, they gave the outgroup member the negative resource even though they had the option to throw it in a trashcan and hence spare the outgroup member (Buttelmann & Böhm, 2014). 8-year-olds were also more likely to take a negative resource to spare the other player from receiving it when the other individual was an ingroup member than when he was an outgroup member (Böhm & Buttelmann, 2017). Hence, 8-year-olds showed a larger ingroup–outgroup bias than 6-year-olds when allocating positive resources (Buttelmann & Böhm, 2014; Fehr et al., 2008) and negative resources (Böhm & Buttelmann, 2017).

In sum, empirical evidence for children's self-sacrifice in the intergroup context is scarce (Böhm & Buttelmann, 2017), and the few existing studies leave open many questions. First, in Böhm and Buttelmann's (2017) paradigm, children were asked to split a finite number of resources between themselves and another player, so that every positive item they gave away meant one item less for themselves, and every negative resource they accepted meant one item less for the other player. In other words, in this paradigm, egalitarianism came at a direct cost. However, children can also demonstrate egalitarianism in situations in which their own share remains stable and in which they can determine another person's resources (e.g., Fehr et al., 2008). We combined both research designs and introduced different types of games for both positive and negative resources to investigate the scope and limits as well as the motivation of children's egalitarianism.

We assessed 6- and 8-year-old children because significant changes in the ingroup bias, and especially for outgroup degradation, have been reported across this age range (Böhm & Buttelmann, 2017; Buttelmann & Böhm, 2014; Fehr et al., 2008). We used the approach by Fehr and colleagues (Fehr et al., 2008), whereby children were allowed to choose between an egalitarian allocation of resources (1:1 that is, one resource for themselves, one resource for their counterpart) and an unequal allocation in a series of six different games (see Figure 1). By using these different tasks, we were able to investigate the motivation behind an egalitarian choice, which also guided our labels for the different games. Three games involved positive resources (prosocial game: 1:0 that is, one for themselves and none for the other person; sharing game: 2:0 that is, two for themselves and none for the other person; envy game: 1:2 that is, one for themselves and two for the other person). Another three games involved negative resources (altruism game: 0:2 that is, none for themselves and two for the other person; mean game: 1:0 that is, one for themselves and none for the other person; sparing game: 1:2 that is, one for themselves and two for the other person).

On a larger scale, implementing these games allowed us to test whether children's egalitarianism is motivated by prosocial or antisocial intentions (for a similar distinction, see Williams & Moore, 2016). Egalitarian distributions were prosocial in the prosocial game and sharing game (positive resources) and in the sparing game and altruism game (negative resources). This means that an egalitarian distribution increased the coplayer's number of positive resources and decreased their negative resources. Egalitarian distributions were antisocial in the envy game (positive resources) and in the mean game (negative resources). This means that an egalitarian distribution decreased the coplayer's number of positive resources and increased their negative resources. Additionally, as Fehr et al. (2008) pointed out, analyzing the games separately allows differentiating between egalitarian distributions that do not affect the own share (i.e., prosocial game, envy game, mean game, and sparing game) and egalitarian distributions that do affect the own share (sharing game and altruism game).

Based on recent research (e.g., Böhm & Buttelmann, 2017; Fehr et al., 2008), we expected that 8-year-olds would behave in a more egalitarian way than 6-year-olds irrespective of the resource valence (Hypothesis 1). We also expected that this general developmental trend would depend on the coplayer's group membership. That is, 8-year-olds should be more likely than 6-year-olds to choose the egalitarian distribution when sharing with a person from their own group regardless of the resource valence. In contrast, 8-year-olds should be more likely than 6-year-olds to decrease the coplayers' number of positive resources and increase the coplayers' number of

negative resources when sharing with a person from the outgroup. This should result in 8-year-olds (but not 6-year-olds) choosing an egalitarian distribution in the envy game and the mean game, and a nonegalitarian distribution in the sharing game, the prosocial game, the sparing game, and the altruism game (Hypothesis 2).

Method

Participants

The final sample consisted of 29 6-year-olds (M = 6 years; 15 days, Min = 5 years; 10 months; 20 days, Max = 6 years; 1 month; 18 days, 15 boys, 14 girls) and 25 8-year-olds (M = 7 years; 10 months; 29 days, Min = 7 years; 10 months, Max = 8 years; 19 days, 12 boys, 13 girls). Three additional 8-year-olds had to be excluded because of procedural errors. The recruitment age was 6 and 8 years +/- 2 months. 83 % of the children had one or more siblings. The mean age of mothers was 40 years, and the mean age of fathers was 43 years. 74 % of mothers and 78 % of fathers had obtained an Abitur (German university entrance-level qualification). Accordingly, the study sample overrepresented families with a higher education, who likely also had a higher socioeconomic status.

Children were recruited from a list of parents who had previously agreed to participate in child-development studies. This list of parents was collected by sending an invitation letter to all families in the city of Bochum within the first 4 years after the birth of the child. There were no other inclusion or exclusion criteria. Children were recruited by telephone approximately 1 week before the assessment took place at Ruhr University Bochum. All 54 children participated in 12 trials [2 resource valences (positive, negative) x 2 coplayer's group membership (ingroup, outgroup) x 3 games (sharing/altruism, prosocial/mean, envy/sparing)], resulting in 648 trials. Ten trials had to be excluded because, when the children were asked for the reason for their decision, their responses indicated that they reattributed the purpose of the game (e. g., choosing 1:0 instead of 1:1 for negative resources to "win" against the coplayer). Another 64 trials had to be excluded because subsequent valance ratings indicated that the children either disliked the positive resource or liked the negative resource. Both exclusion criteria applied to one trial, leaving 573 valid trials (88.4 %). The study was approved by the Faculty of Psychology's Ethics Committee at the Ruhr University Bochum (no. 159).

Materials and Setup

In the resource allocation task, the positive resources were photographs of a lollipop, a chocolate bar ("Twix"), another chocolate bar ("Milky Way"), a chewy fruit bar ("Maoam"), a small bag of fruit gums ("Lachgummi"), and another small bag of fruit gums ("Haribo Goldbären"). The negative resources were photographs of a slug, a slice of moldy bread, a thistle, a broken bottle, a cigarette stub, and a black banana peel. To illustrate the different numbers of allocated resources, the photographs showed either one or two of the resources listed above. The children collected the photographs in two boxes, one for the coplayer and another for themselves, to which they attached a sticker with their name written on it.

To establish the children's group membership, they were asked to wear an orange or a green T-shirt provided by the experimenter (adopted from Dunham et al., 2011). Additionally, cloth in the same color as their T-shirt covered the wall above the table at which they were sitting. Attached to this cloth were one orange and one green sheet of cardboard. Each sheet of cardboard showed four children (two boys, two girls) wearing a T-shirt of the same color as the cardboard. The photographs of the children were taken from the Radboud Faces Database (Langner et al., 2010). The website of this database indicates that "in strictly scientific publications RaFD images can be presented as stimulus examples." Two children, one from each group – matched for sex – served as coplayers for the participating child. The current coplayer's photo was held upright by a small clip that was located between two boards on which the resources were located.

In each game, the positive and negative resources were placed on two boards on the table. Each board depicted two circles, and the photos of the resources were placed within the circles. There were two arrows painted on each board, each of which started at the contour of one circle. One arrow on each board pointed toward the photograph of the coplayer, while the other pointed toward the participant. The color of each circle matched the T-shirt color of the child the arrow was pointing to.

The testing room (3.6 x 1.7 m) was empty except for one child-sized table, two child-sized chairs for the child and the experimenter, and the equipment for the tasks. A video camera with a panoramic lens videotaped the test session from the ceiling in a corner of the room.

Design

The experiment examined the effect of the group membership of the coplayer (ingroup, outgroup) and valence of
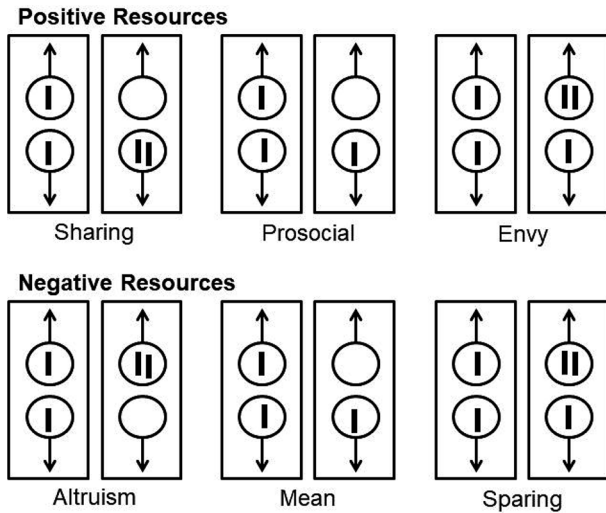
Positive Resources

Figure 1. Illustration of the six different games with positive resources (upper row) and negative resources (lower row). The label of each game refers to the egalitarian allocation (1:1) in comparison to the unequal allocation.

resources (positive, negative) as within-subject factors and the role of participants' age (6-year-old, 8-year-old) as a between-subjects factor. Accordingly, we tested each child in four conditions (ingroup coplayer/positive resources, ingroup coplayer/negative resources, outgroup coplayer/positive resources, outgroup coplayer/negative resources). Each child played three different games in each condition. The order of the coplayers' group membership, valence of resources, and games was counterbalanced across children.

Procedure

The experimenter accompanied the children and the parents to the testing room where the parents were informed about the details of the study and gave written consent for their child to participate. After a short warm-up period, the parents were asked to wait in an adjacent room and complete a sociodemographic questionnaire and a temperament questionnaire that was not further considered for the present study. All children participated in six games of the resource allocation task first, then in a 5-min task that went beyond the scope of the present study, and finally in the remaining six games of the resource allocation tasks.

In the resource allocation task, the experimenter gave the children an orange or green T-shirt and asked them to put it on. Next, she took a photo of the children, printed it out, and attached it to the cardboard with the photos of children who belonged to the same team (i.e., green or orange). The children were asked to write their names on

a sticker attached to one of two boxes that served as containers for the photographs depicting the positive and negative resources. In a familiarization game, the children's coplayer was a teddy bear. As in the following games, the experimenter gave the children a choice between allocating resources in an equal and an unequal way. Specifically, the experimenter put one photograph depicting a piece of candy (egalitarian distribution) in each circle on one of the boards. On the other board, she put one photograph depicting a piece of candy in the circle with the arrow pointing to the participating child and no photograph in the circle pointing to the coplaying teddy bear. If the child chose the board with the egalitarian distribution, the child and the teddy would both receive a photograph. If the child chose the other board, only the child but not the teddy would receive a photograph. After the child had chosen one of the two distributions, the experimenter gave the real piece of candy in exchange for each photo. She told the child that at the end of the experiment, they would be able to trade the resources depicted on the collected photos for real resources (see Appendix A for the experimenter's verbal instruction).

The resource allocation task consisted of 12 games. In all games, children could choose between an egalitarian allocation (one resource for them, one resource for the coplayer, in the following labeled as 1:1) and an uneven allocation that depended on the particular game. The coplayer always had the same sex as the participant. Before each game, the experimenter explained the consequences of their choice to the children after she had placed the resources on the boards. After each of the children's choices, the experimenter asked them about the reason for their choice. Six consecutive games were conducted with one coplayer, and the other six consecutive games were conducted with the other coplayer. These six games were divided into three consecutive games in which negative resources were allocated and three consecutive games in which positive resources were allocated. The three games for the positive resources were labeled as the *sharing game*, the *prosocial game*, and the *envy game* (as in Fehr et al., 2008); the three games for the negative resources were labeled as the *altruism game*, the *mean game*, and the *sparing game* (see Figure 1 for the different allocations)

In a final valence rating, the experimenter asked the child whether or not they liked each of the 12 resources. The answers were used to analyze whether the children liked the positive resources and disliked the negative resources as intended.

After completion of the experimental procedure, the experimenter pretended that she could not find the box with the negative resources and gave the child only the candy.
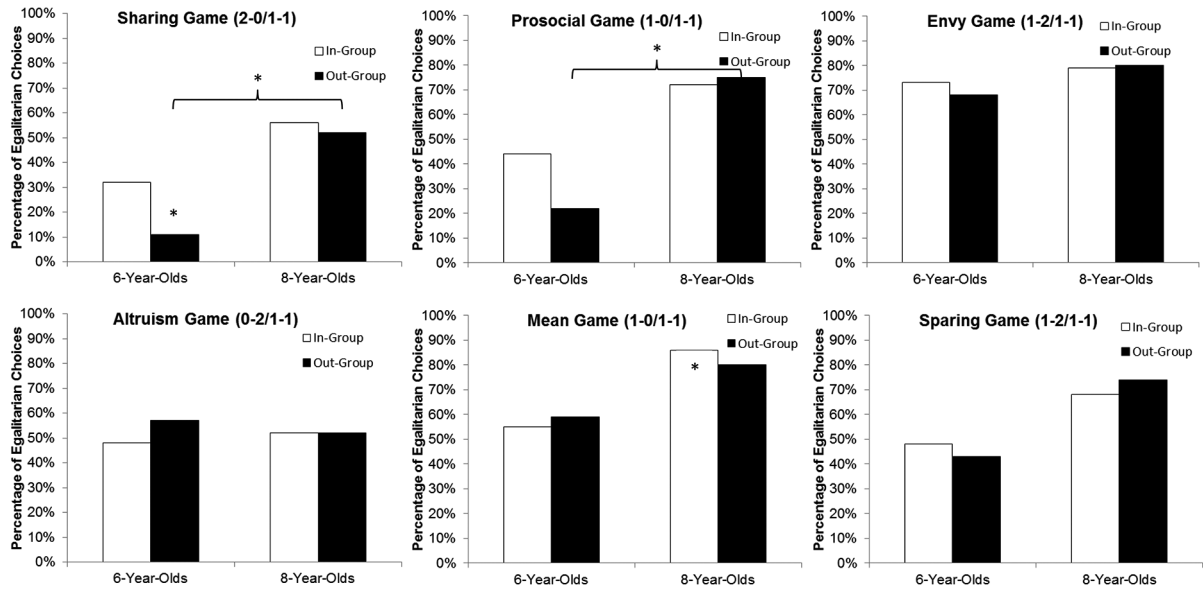
Figure 2. Children's percentage of egalitarian choices in the six games. Asterisks associated with one bar represent significant differences from 50% chance level. Asterisks associated with a parenthesis represent significant age differences in the respective game.

Scoring and Analysis

We coded whether the children made an egalitarian choice (1:1) in each game (scores: 1 for egalitarian choice, 0 for the nonegalitarian choice). Children hence received a score of 0 or 1 in 12 trials. Each of the six games was played twice, once with the ingroup coplayer and once with the outgroup coplayer. For Hypothesis 1, we used generalized estimating equations (GEE) with a binary logistic model to analyze the data. In contrast to mixed-effects ANOVAs, GEEs allow for missing data in each participant and also allow for analyzing binary data. For Hypothesis 2, we used binomial tests and Mann-Whitney U-tests. Data are available on request from the authors.

Results

Overall, children chose an egalitarian allocation in 57.1% of all games. To test the relationship between egalitarianism and the children's age (Hypothesis 1), we ran a GEE with the children's age (6 years, 8 years) and resource valence (positive, negative) as factors and children's choice (egalitarian, nonegalitarian) as the dependent variable. Confirming Hypothesis 1, 8-year-olds showed more egalitarian behavior than 6-year-olds (68.8% vs. 46.1%, Wald χ^2 (1) = 10.673, p = .001). There was no main effect of the resource valence (Wald χ^2 (1) = 1.725, p = .189) and no interaction between resource valence and age (Wald χ^2 (1) = 1.868, p = .172). Figure 2 shows the age differences in egalitarianism between 6- and 8-year-olds across the different types of games.

To test Hypothesis 2, we analyzed how the children's age and group membership influenced the children's choice of the egalitarian distribution. To this end, we ran binomial tests for each game in each of the four conditions (group membership: ingroup/outgroup; age: 6 years, 8 years) against a chance level of 50%. Additionally, we tested via Mann-Whitney U tests whether there was a change in egalitarian distributions across age. We used the Bonferroni correction for multiple testing in the binomial tests (p = .002; 24 tests) and in the Mann-Whitney U tests (p = .004; 12 tests).

As displayed in Figure 2, and in contrast to Hypothesis 2, 6-years-olds were significantly *below* chance level in the sharing game when the coplayer was an outgroup member (p < .001; n = 27). Likewise in contrast with Hypothesis 2, 8-year-olds were significantly *above* chance level in the mean game when the coplayer was an ingroup member (p = .001; n = 21). The other binomial tests were not significant (all p-values > .003).

In the subsequent tests for age differences, we found a statistically significant age difference in egalitarian distributions: 8-year-olds chose the egalitarian distribution more often than 6-year-olds in the prosocial game and in the sharing game when the coplayer was an outgroup member (U = 153, p < .001; U = 200, p = .002, respectively). This result also did not agree with Hypothesis 2. The other Mann-Whitney U tests were not significant (all p-values > .027).

Discussion

The results of the present study suggest that children's egalitarianism increases as a function of age, as predicted in Hypothesis 1. Children's egalitarianism was further influenced by a combination of the coplayer's group membership, the resource valence, and the type of game – but not as predicted in Hypothesis 2. 6-year-olds – but not 8-year-olds – rarely shared two positive resources with an outgroup member (sharing game) and did not give the outgroup member one positive resource instead of no positive resource (prosocial game). This ingroup-outgroup bias for positive resources was not observable in 6-year-olds when they could allocate one or two positive resources to the outgroup player in the envy game, where they received one positive resource in any case. For negative resources, we could not find an ingroup-outgroup bias.

This study supports the idea that egalitarianism becomes more prevalent over time among primary school children (Fehr et al., 2008; Paulus & Moore, 2014). In an extension of these previous studies, we found that a developmental progression also applies to negative resources because, when testing Hypothesis 1, we found only a main effect of Age but not a significant Age x Resource valence interaction. In other words, 8-year-olds were more motivated than 6-year-olds to see both pleasant and unpleasant items being equally distributed between themselves and others.

Although the 8-year-olds were more egalitarian-minded than the 6-year-olds across the games as expected (e.g., Fehr et al., 2008), two findings stood out. First, 6-year-olds chose the egalitarian distribution below the chance level of 50% in the sharing game when the coplayer was an outgroup member. Second, and relatedly, 8-year-olds were more likely than 6-year-olds to share two positive resources with an outgroup member. They were also more likely than 6-year-olds to give the outgroup member one positive resource when it did not affect their own share. This was in sharp contrast to our Hypothesis 2. Based on previous research, we had predicted that the ingroup-outgroup bias should be higher in 8-year-olds than in 6-year-olds. Previous findings had showed that primary school children's age-related increase in egalitarianism is limited to ingroup members (Fehr et al., 2008), and that their outgroup degradation increases with age (Böhm & Buttelmann, 2017; Buttelmann & Böhm, 2014). This finding is also remarkable because the age difference in egalitarian choices between 6 to 8 years with an outgroup coplayer revealed different motivations. In the prosocial game, children's own share was not affected by their egalitarianism. In contrast, their egalitarian decision in the sharing game represented a loss of one positive resource. In both cases, the egalitarian distribution had a prosocial intent because it increased the outgroup coplayer's number of positive resources. This implies that older children favor egalitarianism for prosocial reasons – irrespective of whether this decision affects their own share.

The present unexpected finding might be explained by other factors. For example, a meta-analysis on prejudices showed that 8–10-year-olds were less prejudiced against outgroups than 5–7-year-olds (Raabe & Beelmann, 2011). It is unclear whether prejudices are responsible for allocating resources. Based on the marked outgroup bias in older children in previous studies on allocating resources, this study design should include measures of prejudices (e.g., contact intent, liking, trait attribution) to further investigate the mixed results. The age difference in egalitarian behavior toward an outgroup peer could also be caused by their being observed during the resource allocation (Leimgruber et al., 2012), or by their motivation to "do the right thing" (Capraro & Rand, 2018), namely, to help the outgroup peer. Our findings suggest that the proposed development of the ingroup-outgroup bias in prosociality in general, and egalitarianism in particular, is not as universal as previously assumed (Buttelmann & Böhm, 2014; Fehr et al., 2008). In fact, it is more in line with the decrease of prejudices against outgroups' members from age 5–7 to age 8–10 (Raabe & Beelmann, 2011). In future studies, establishing children's motives behind their sharing decisions could be revealing.

Another remarkable finding of the present study was that 6-year-olds chose the egalitarian allocation for the negative resources in about 50% of the cases. A previous study had reported a lower rate in a similar paradigm (Böhm & Buttelmann, 2017). There are different explanations for this finding. For the altruism game and the sparing game, the finding could mean that 6-year-olds are less selfish than previously thought. However, alternative explanations could apply as well. For example, 6-year-olds might have randomly chosen the egalitarian allocation in this study. However, we think that this is an unlikely explanation because 6-year-olds are known for their sensitivity to resource allocations in these types of tasks (Buttelmann & Böhm, 2014; Fehr et al., 2008; Smith & Warneken, 2016), and 6-year-olds performed significantly below a 50%-level in the prosocial game with an outgroup coplayer. Another alternative interpretation is that some children might have simply thought that they could just toss the negative resources. If this explanation applies, children should be more selfish when inevitable duties are to be allocated (e.g., tidying up a messy playroom).

The fact that 8-year-olds chose the egalitarian distribution in the mean game above chance level when the coplayer was an outgroup member is difficult to interpret because this behavior was virtually identical with the children's behavior in this game when the coplayer was an ingroup member. We think that this behavior mirrors the increased tendency in 8-year-olds to opt for the egalitarian distribution.

The present study has several limitations. First, the ecological validity of the present task could have been limited because, in real life, children have more information available to them. For example, they are sensitive to the recipients' wealth (Paulus & Leitherer, 2017) or to the recipient's previous collaboration (Plötner et al., 2015). Although the latter study showed that the coplayers' minimal-group membership is as important as their witnessed collaborations, it would be more ecologically valid to provide children with some context information. For example, the participants could witness the coplayer's egalitarianism (i.e., high vs. low) before the allocation games are conducted. Second, the ecological validity of the children's self-sacrifice was potentially limited. That is, while children sometimes have the possibility to allocate positive resources (e.g., candies) to other children, they seldom have the possibility to allocate negative resources (e.g., moldy bread) to other children. Usually, they show self-sacrifice by taking unpleasant responsibilities, such as doing the heavy lifting when tidying up after playing with other children (for an allocation of unpleasant tasks, see Smith & Warneken, 2016). Previous studies also used negative resources (Kenward & Östh, 2015; Wörle & Paulus, 2018). Since we intended to keep the tasks as similar as possible across resource valence, we decided to use positive and negative resources as in previous studies (e.g., Böhm & Buttelmann, 2017; Buttelmann & Böhm, 2014). A third potential limitation derives from the fact that all positive resources came from the same category (i.e., candy), whereas the negative resources came from different categories. Although children rated the valence of the resources as expected, future studies should use more equivalent stimuli such as tasty versus disgusting cookies (Wörle & Paulus, 2018) or fun versus tedious tasks (Smith & Warneken, 2016). Another limitation is that we did not use a manipulation check for the ingroup-outgroup manipulation. Although previous studies using similar paradigms (e.g., Fehr et al., 2008) did not use manipulation checks, future studies should incorporate these questions. Finally, our statistically nonsignificant results must be interpreted cautiously because of the sample sizes of $n = 25$ and $n = 29$ for the respective age groups.

In conclusion, this study replicated and extended previous studies regarding the development of egalitari-

anism with increasing age in childhood. In contrast to previous findings, we found a surprising age difference: 8-year-olds were more egalitarian than 6-year-olds when sharing positive resources with outgroup coplayers. This finding suggests that children's prosocial behavior toward outgroup members is more flexible than previously thought.

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Appendix A

Instructions that were given for the allocation of resources.

Before testing

"It is great that you participate in today's game. Please put on the [orange/green] T-Shirt before the game starts. Just put it over your sweatshirt/T-Shirt. Look, here are photos that show a lot of other children. They have played the game together with me before. Every child gets his/her photo when the game has finished. Would you please stand over there so I can take a photo for the poster? This is part of the game."

The experimenter takes a photo of child.

"Please note that your parents or the children depicted on the photos won't know what you did when playing today's game. I'll explain to you how the game works and if you have any questions just ask me, okay? Let's start."

Test trial

"Here are two boxes, this one is for you and that one is for your co-player. Let's attach a sticker that has your name to your box. Do you want to write your name yourself or shall I write it for you?"

The experimenter places the two boards, one for the equal, the other one for the unequal distribution in front of the child and places the child's box next to the child.

"I'll explain the game to you. I will place photos on the boards and these photos show different things. You may choose some of the photos. At the end of the game, we will swap the things on the photos for the real things! In the first test round, you play with teddy."

The experimenter puts the teddy on the opposite side of the table.

"On one board, I will place a photo of one Smarties package in the circle right next to you and a photo of one Smarties package in the circle right next to the teddy. On the other board, I will place a photo of one Smarties package in the circle right next to you and no photo in the circle right next to the teddy. If you choose this board *(experimenter points towards the first board)* you will get the candy that is in the circle of the arrow pointing towards you *(experimenter points towards the circle next to child)*. The arrow of the other circle points towards the teddy. This means teddy gets the other candy *(experimenter points towards the circle next to the teddy)*. If you choose the other board *(experimenter points towards the second board)* you will get this candy *(experimenter points towards the circle next to child)* and the teddy won't get a *candy (experimenter points towards the empty circle next to the teddy)*."

"As I said before, you will swap the items that are depicted on the photos that you have chosen for the real things. And the good thing is, you can take them all home."

Control questions

Experimenter points towards one board.

"If you choose this board what does teddy get?

If you choose this board what do you get?"

Experimenter points towards the other board.

"If you choose this board what does teddy get?

If you choose this board what do you get?"

If the child answers one question incorrectly, the experimenter explains the rules again and repeats the control questions.

If child has answered all questions correctly, the experimenter asks: "Do you have any other questions?" *The experimenter answers the questions if the child has any.*

"You can now choose one of the boards."

After the child has chosen one board, the experimenter comments the outcome: "Okay. Teddy gets [one Smarties package/ nothing] and you get one Smarties package."

The experimenter places the photos next to the boxes.

"Let's swap the candies of the test trial right now before the actual game starts. Please give me the photo that you have just got. Here is one Smartie package that you can take home and eat later."

The experimenter puts away the teddy and puts the Smarties into the box.

"Here are two posters at the wall. One poster is orange, the other one is green. The children on the posters already played the game. We don't know the children's names and we won't tell them what you did when playing today's game. The green poster is for the green team, the orange poster is for the orange teem. Your photo belongs to the [green/ orange] poster, because you play in the [green/orange] team. This is why you wear the [orange/green] T-shirt."

The experimenter puts the photo on the respective cardboard.

"We play the games two times, one time with a child from your [orange/green] team, one time with the child from the other team."

The experimenter takes one the photos from the cardboard.

"Look, this is the child you play with in the first round."

In-group condition: "[He/she] wears a [orange/green] T-shirt. This means [he/she] belongs to the [orange/green] team. You are also wearing a [orange/green] T-shirt, that means you also belong to the [orange/green] team."

Out-group condition: "[He/she] wears a [orange/green] T-shirt. This means [he/she] belongs to the [orange/green] team. You are wearing a [orange/green] T-shirt, that means you belong to the [orange/green] team."

The experimenter places the photo on the opposite side of the boards.

"Here are two boards. Each board has two circles with different colors and with arrows. One arrow points towards you and the other arrow points towards the other child." *The experimenter illustrates these instructions by pointing towards the respective arrows.*

"Now you play with the other child that is shown on the photo from the [orange/green] team."

Sample instruction for one game

"On this board, I place [*name of the resource*] in the circle that is next to you and [name of the resource] in the circle next to the other child" (*if no photo was placed in the circle:* "the circle next to other child remains empty").

The experimenter places the photos in the circles.

On the other board, I place [*name of the resource*] in the circle that is next to you and [*name of the resource*] in the circle next to the other child" (*if no resource was placed in the circle:* "the circle next to child remains empty").

The experimenter places the photos on the circles.

"In just a moment you can choose one of the boards. If you choose this board you will get the [*name of the resource*] in this circle with the arrow that points towards you. The arrow of the other circle points towards the other child. This means the other child gets the [*name of resource*] in this circle" (*if no photo was placed on the circle:* "This means the other child gets nothing."). *The experimenter illustrated her explanations by pointing towards the corresponding parts of the setting.*

"Alright, now you can choose one board."

After the child has chosen one board: "Okay. The other child gets [*name of the resource/*"nothing"] and you get [*name of the resource/*"nothing"].

The experimenter places the photos next to the boxes of the participant and the co-player.

Why question

"Why did you choose this board?"

The experimenter puts the photo of the resource into the box of the co-player and asks the participant to do the same with his/ her photo. The experimenter puts away the remaining photos on the board.