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## Preschoolers agree to and enforce prosocial, but not selfish, sharing norms

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### ABSTRACT

Young children act prosocially in many contexts but are somewhat selfish when it comes to sharing their resources in individual decision-making situations (e.g., the dictator game). But when deciding collectively, would they make it a binding rule for themselves and others to act selfishly in a resource sharing context? Here we used a novel “group dictator game” in a norm creation paradigm to investigate whether 3- and 5-year-olds ( $N = 48$ ) would agree to and enforce a selfish or prosocial sharing norm. Children from a Western cultural background were paired with two puppets at a time. Each group member had an endowment of four stickers and faced a photograph of a recipient. In the prosocial norm condition a proposer puppet suggested to share half of one’s endowment, whereas in the selfish norm condition another proposer suggested to share nothing. The protagonist puppet then either followed or violated the suggested norm. We found that 5-year-olds (but not 3-year-olds) rejected selfish proposals more often than prosocial proposals. Importantly, older (but not younger) preschoolers also enforced the prosocial (but not the selfish) norm by protesting normatively and intervening when the protagonist acted selfishly (and thus violated the norm). These results indicate that a collective decision-making context may enhance preschoolers’ prosociality and that moral considerations on the content of a

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proposed sharing rule influence preschoolers' creation and enforcement of such nonarbitrary norms.

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## Introduction

It is a commonplace observation that, despite their cooperativeness and ultra-sociality (Jensen, Vaish, & Schmidt, 2014; Richerson & Boyd, 1998; Tomasello, 2014), humans sometimes act selfishly such as refraining from providing help or from sharing with others in need. In fact, the philosopher Immanuel Kant was even pessimistic about human nature in some of his writings, arguing that humans have acquired a corrupt propensity to pursue their self-interests (Kant, 1793/2009). Nevertheless, normatively speaking, he was very clear that it would be irrational to want a world in which everyone adopted a personal rule of not engaging in any other-oriented prosocial behavior whatsoever (Kant, 1785/2002). But to fulfill one's "imperfect" or "wide" duties of beneficence, as Kant had it, there is wiggle room in choosing a personal rule that would guide one's social actions (Kant, 1797/1996). Based on these notions, we investigated, from a developmental perspective, whether preschoolers—who are at times selfish, for instance, in the context of costly resource sharing (Fehr, Bernhard, & Rockenbach, 2008; Smith, Blake, & Harris, 2013)—would agree upon and enforce a selfish norm (everyone shares nothing) or a prosocial norm (everyone shares half) in a collective decision-making situation.

### *Preschoolers' behavior and reasoning in costly sharing situations*

Much recent research suggests that preschoolers and even toddlers are prosocial beings who spontaneously help others, share their resources, and comfort others (Hepach, Haberl, Lambert, & Tomasello, 2017; Hepach, Vaish, & Tomasello, 2012; Kuhlmeier, Dunfield, & O'Neill, 2014; Schmidt & Sommerville, 2011; Sommerville, Schmidt, Yun, & Burns, 2013; Svetlova, Nichols, & Brownell, 2010; Vaish, Carpenter, & Tomasello, 2009; Warneken & Tomasello, 2006). Nonetheless, young children can also be selfish. In particular, situations in which children have the opportunity to part with their own resources—for instance, costly (altruistic) sharing in a dictator game where one can choose how much of an endowment to share with someone else—reveal some reluctance to act in other-oriented ways that seems to decline over development (Benenson, Pascoe, & Radmore, 2007; Fehr et al., 2008; Gummerum, Hanoch, Keller, Parsons, & Hummel, 2010; Kogut, 2012; Rochat et al., 2009; Smith et al., 2013). For instance, Smith et al. (2013) found that in a dictator game scenario, younger preschoolers (3- and 4-year-olds) shared only about one eighth of their endowment, older preschoolers (5- and 6-year-olds) shared about one fourth of their endowment, and young school-aged children (7- and 8-year-olds) shared about half of their endowment. Interestingly, however, children at all ages stated that they themselves and others should share equally in the task, suggesting some awareness of a "norm" of equal sharing or at least knowledge about others' (e.g., adults') expectations and desires in sharing situations. Corroborating and extending these results, Kogut (2012) found rather selfish sharing behavior (5- and 6-year-olds shared one fifth of their endowment, and 7- and 8-year-olds shared one third of their endowment) and, interestingly, found reports of happiness with selfish sharing decisions. It was not until 9 and 10 years of age that children reported more satisfaction when sharing half than when sharing less or nothing.

Overall, then, preschoolers (especially younger ones) seem to be somewhat selfish when it comes to sharing their resources with others. Moreover, their selfish behavior conflicts with their judgment of what they and others should do, namely, share equally (Smith et al., 2013). This calls their normative understanding of sharing into question. Their behavior suggests that they do not care (sufficiently) about an equal sharing norm; they obviously do not apply such a "norm" to themselves. But does this imply that preschoolers would be more likely to establish and enforce a selfish sharing

norm than a prosocial sharing norm? Not necessarily given that normative (and here moral) considerations might be more prominent in a group situation where children not only decide how they act on a single occasion in the here and now (based on individual intentionality) but also are urged to think about how “we”—as a group—want to behave in a sharing context and agree upon a binding rule that guides their own and others’ sharing actions (based on collective intentionality; Schmidt & Rakoczy, 2019; Schmidt & Tomasello, 2012; Searle, 1990). In fact, recent theory and research suggest that from around 3 years of age, children readily think in such collective ways and begin to identify with their cultural group, which results in strong motives to uphold common norms (Schmidt, Butler, Heinz, & Tomasello, 2016; Schmidt & Tomasello, 2012). Moreover, when it comes to allocating collective resources in an intergroup context with existing group norms, preschoolers evaluate selfish (group-advantageous) deviation from an equal allocation norm more negatively than prosocial (group-disadvantageous) deviation from an ingroup-favoring allocation norm (Cooley & Killen, 2015). Considering this and further empirical evidence that preschoolers care about moral issues, such as fairness and the well-being of others (Jensen et al., 2014; Killen & Smetana, 2015; Schmidt & Rakoczy, 2019; Warneken & Tomasello, 2009), it seems plausible to assume that in a norm-creation group situation, preschoolers (at least older ones) would rather agree to and enforce a prosocial sharing norm than a selfish sharing norm.

### *Stipulating and enforcing norms*

Research over the last couple of years has shown that young children not only follow norms but also actually engage in disinterested norm enforcement when others “break the rules” (Schmidt & Rakoczy, 2018). This applies to both more arbitrary conventional norms (e.g., game rules; Rakoczy, Warneken, & Tomasello, 2008; Schmidt, Hardecker, & Tomasello, 2016) and more nonarbitrary moral norms regarding others’ welfare and distributive justice in a third-party resource allocation situation (Rakoczy, Kaufmann, & Lohse, 2016; Schmidt, Rakoczy, & Tomasello, 2012). These studies investigated children’s understanding of existing norms with children either learning norms from adults during the experiment or having prior knowledge of (moral) norms. Even without explicit instruction, young children are quick, perhaps overly quick, at attributing normativity to others’ intentional actions they incidentally observe, thereby constructing norms independently and paying close attention to any relevant cues (Schmidt, Butler, et al., 2016; Schmidt, Rakoczy, & Tomasello, 2011). In addition, preschool children engage in simple forms of norm creation among peers, for instance, in an instrumental task where triads need to work together and coordinate their actions effectively to receive some reward (Göckeritz, Schmidt, & Tomasello, 2014). However, children not only appreciate the rational force of coordination norms (without coordination, there is no achieving of rewards) but also have some understanding of the notion that we can establish and enforce totally arbitrary norms by mere agreement. For instance, a group of people may decide to perform a solitary game-like action in a particular way even though there is no need to coordinate (e.g., using a red box or an equivalent blue box to play with). Interestingly, young children aged 3 years understand such arbitrary norms to come into existence only if everyone involved agrees (Schmidt, Rakoczy, Mietzsch, & Tomasello, 2016). Thus, unanimous agreement (and not, e.g., majority rule) seems to be required for arbitrary conventional norms to be established, at least for young children.

Although there is some evidence, then, that children can agree upon and enforce different types of conventional norms in a group situation, to our knowledge there is no research on children’s participation in stipulating, including enforcing nonarbitrary morally relevant norms such as sharing rules (although there is much work on children’s enforcement of preexisting moral norms; Schmidt et al., 2012; Vaish, Missana, & Tomasello, 2011; Wörle & Paulus, 2018). The sharing context of interest in the current study involves a duty-based normative perspective—that is, people should share according to this or that norm. But it potentially also involves a rights-based perspective given that owners are entitled to decide on their property and people have a right to be treated with benevolence. The classical dictator game scenario involves an individual who receives resources and is, by declaration, the owner of the resources. Recent research suggests that by 3 years of age, children have a strong normative sense of property and entitlement and also respect and defend an owner’s entitlement to restrict

access to his or her property (Friedman, Pesowski, & Goulding, 2018; Schmidt, Rakoczy, & Tomasello, 2013).

Thus, the investigation of preschool children's behavior and judgment in a morally relevant sharing situation is interesting for several reasons. First, it would clarify whether children would agree upon and even enforce a sharing norm in a collective decision-making situation. Second, it would provide information on whether the stipulation and enforcement of rules in a morally relevant situation depends on the content of the norm (prosocial or selfish). Third, it would provide a new perspective on the alleged judgment-behavior gap regarding resource sharing. In contrast to individual decision making in the conventional dictator game, a collective decision-making context may have the potential to enhance children's prosociality given the theoretical assumptions about its underlying normative and collective intentional structure explicated above.

### *The present study*

In the current study, therefore, we used a group norm creation paradigm (Schmidt, Rakoczy, et al., 2016) and investigated whether 3- and 5-year-old children would agree upon and enforce prosocial or selfish sharing norms. We chose to include both 3- and 5-year-olds in this study because, as outlined above, (a) children's self-oriented sharing behavior declines during the preschool years (and further decreases during early school age), whereas both 3- and 5-year-olds judge that they and others should share equally in a dictator game (Smith et al., 2013); (b) children aged 3 years readily stipulate and enforce norms in a structured group situation but also defend others' entitlement (a potential normative aspect in a dictator game) to their property (Schmidt, Rakoczy, et al., 2016; Schmidt et al., 2013) and have difficulties in coordinating two conflicting aspects of a situation (e.g., norms of a different type; Kalish, 1998; Perner & Roessler, 2012; Schmidt, Hardecker, & Tomasello, 2016), which might prevent them from enforcing any sharing norms on others; and (c) preschoolers care about moral concerns from early on, with older children using more reasoning about issues of equality than younger children in resource allocation contexts (Cooley & Killen, 2015), which might lead older preschoolers, rather than younger ones, to enforce prosocial sharing norms that dictate equal sharing but not selfish sharing norms that dictate no sharing.

Children were paired with two puppets and played an adapted version of the group dictator game (Cason & Mui, 1997; Luhan, Kocher, & Sutter, 2009) with collective decision making (a group's sharing norm) for how many stickers each individual should share with another child who would be sad without receiving any stickers. In the *prosocial sharing norm condition* a proposer puppet suggested that everyone shares half of their individual endowment, whereas in the *selfish sharing norm condition* a different puppet suggested to share nothing. A protagonist puppet then later either *followed* the proposed norm or *violated* the proposed norm (i.e., acted prosocially in the selfish sharing norm condition or acted selfishly in the prosocial sharing norm condition). We measured children's disagreement and agreement with the suggested norm. Moreover, we measured children's spontaneous protests against the protagonist who either followed or violated the proposed sharing norm. Based on the empirical findings of age-related changes in preschoolers' behavior and reasoning outlined above, we predicted that 5-year-olds, but not 3-year-olds, would enforce prosocial sharing norms (i.e., protest more against the protagonist's sharing behavior when the protagonist violates vs. follows the prosocial norm) but not selfish sharing norms. Similarly, we predicted that 5-year-olds, but not 3-year-olds, would be more likely to reject a proposed sharing norm when it is selfish than when it is prosocial.

## **Method**

### *Participants*

In total, 48 preschoolers participated in the study, including twenty-four 3-year-olds (range = 36–47 months,  $M = 3$  years 7 months; 12 girls) and twenty-four 5-year-olds (range = 60–71 months,  $M = 5$  years 5 months; 12 girls). Children came from mixed socioeconomic backgrounds from a large German city. They were recruited via urban day-care centers (in which testing took place). Parents

provided written informed consent. An additional 6 children were excluded from the final sample due to technical error ( $n = 2$ ), experimenter error ( $n = 2$ ), uncooperativeness ( $n = 1$ ), or withdrawal of informed consent by parents ( $n = 1$ ).

### Design

After a warm-up session, children received four trials of the target task in a 2 (Condition: prosocial vs. selfish sharing norm)  $\times$  2 (Norm Adherence: following vs. violating) within-participants design. Condition was varied blockwise, and within each block (two trials) the protagonist's norm adherence (following vs. violating the norm) was alternated between trials; half of the children of each age group received the prosocial condition first, and half of the children of each age group received norm-following behavior first. The proposer puppet introduced first (prosocial vs. selfish proposer) and the set of stickers used as resources were varied systematically. After the target tasks, all children participated in a forced-choice (evaluation) posttest. In this task, the proposer introduced first (prosocial vs. selfish) was counterbalanced between children for each age group.

### Materials

In the warm-up session, a ball, a hammer game, and a disk-and-peg game were used. Two human-like hand puppets (named "Max" and "Emil") were used as proposer puppets; a third human-like hand puppet (named "Hans") was used as the protagonist puppet. The child, the respective proposing puppet, and the protagonist puppet each were given a wooden game board equipped with a green box and a yellow box and a device for fixing a photograph of the receiving child. We used a gender-matched set of photos to portray the recipients in the tasks.

### Procedure

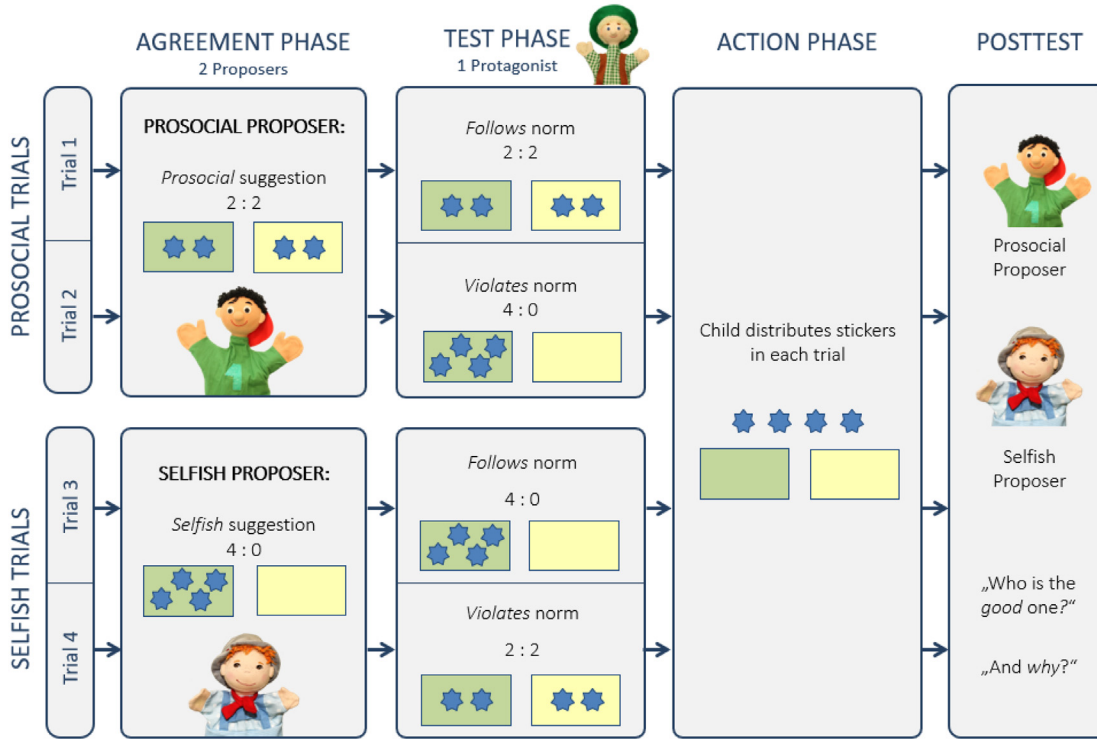
Two experimenters (E1 and E2) conducted the study, which lasted roughly 20 min. E1 coordinated the game and operated the proposer puppets, whereas E2 operated the protagonist puppet. Throughout the tasks, the child, E1, and E2 sat at a table. E1 sat to the child's right, and E2 sat to the child's left. The posttest was coordinated by E2, who sat opposite the child and put the two proposer puppets on stands. Fig. 1 gives a schematic overview of the target task and the posttest.

### Warm-up phase

In the warm-up session, the child and the three hand puppets (the prosocial and selfish proposer puppets and the protagonist puppet) played together with a ball. Thereafter, the two proposers "got tired" and went to sleep. The child, the protagonist puppet, and E1 played a hammer game, followed by a disk-and-peg game. The protagonist acted clumsily to encourage the child to pay attention to the puppet's behavior and to allow for spontaneous intervention as in the later target task.

### Introductory phase

In the introductory phase of the target task, E1 presented three game boards, handed one over to the child, and said, "Here is a board for you with a green and a yellow box. And these are four stickers. Each sticker you put in the green box is yours. This yellow box belongs to this child [pointing at the picture of the recipient] from another kindergarten. Unfortunately, this child did not yet receive any stickers at all, but she/he would like some, too. If she/he does not get any stickers, she/he will be very sad. And here we have two more boards: one for [name of protagonist] and one for Hans. It's the same for them. Hans [addressed personally by E1], the green box is for you, and the yellow box is for the other child. And for [proposer puppet's name] it's the same. The green box is for you [addressing protagonist puppet, still placed on a stand], and the yellow box is for the other child." E1 then turned toward the child and the hand puppets: "And you know what? You can decide together how to distribute the stickers. So, you're a team and decide together how each of you is going to do it, okay?" Then E1 took the proposer puppet off the stand and operated the puppet.



**Fig. 1.** Schematic of the study (here with prosocial condition first). Children received four trials in a within-participants design: a block of two trials in the selfish sharing norm condition and a block of two trials in the prosocial sharing norm condition. The protagonist either followed or violated the respective norm in the test phase. On each trial, children could share their own stickers in the action phase. Finally, children received a forced-choice evaluation posttest.

### Agreement phase

The proposer puppet suggested how to distribute the stickers: “Ah, I have an idea. Shall we do it like this: Each one of us puts [2 / 4] stickers in the green box for ourselves and [2 / 0] stickers in the yellow box for the other child, okay?” Hans replied, “Okay, we can do it like that, can't we?” The proposer [turned to child] asked, “Are we going to do it like this?” The child had the opportunity to agree or disagree with the proposal. In case of the child's disagreement with the proposed sharing norm, the proposer puppet repeated the suggestion up to two more times. Regardless of the child's reaction, the proposer went on and said, “Okay, let's do it this way: So, everyone puts [2 / 4] stickers in the green box for themselves and [2 / 0] stickers in the yellow box for the other child. And I will start.” The proposer distributed the stickers according to the agreed-upon sharing norm. Thereafter, the proposer puppet said, “And now it's Hans's turn. [to child] And you pay close attention, okay?”

### Test phase

In the test phase, the protagonist Hans either shared half his endowment (four stickers) and said, “Two for me and two for the other child,” or did not share any stickers and said, “Everything for me,” putting all four stickers in his box. Depending on condition (prosocial vs. selfish sharing norm), this sharing behavior meant either following or violating the suggested sharing norm (see also Fig. 1), and children had the opportunity to spontaneously intervene against the protagonist.

### Action phase

Finally, the child had the opportunity to share stickers. The number of stickers the child shared with the respective recipient “from another kindergarten” (0–4) was recorded.

### Supplemental task

The supplemental task was a forced-choice evaluation task. E2 sat opposite the child. The two puppets were placed on stands in front of E2, and a game board was installed in front of the child. E2 recapitulated, “Look, [name of Proposer 1] had the idea to distribute the stickers in this way [e.g., E2 put two stickers in the green box and two stickers in the yellow box of the game board]. And [name of Proposer 2] had the idea to distribute the stickers in that way [e.g., E2 placed four stickers in the green box and no stickers in the yellow box]. Who do you think is the good one?” After the child's response, E2 asked the child to justify her or his decision by asking, “And why?” (see also Fig. 1).

### Coding and dependent measures

All sessions were recorded, transcribed, and coded from videotape by a single observer. A second independent observer, blind to the hypotheses and conditions of the study, transcribed and coded a random sample of 25% of all sessions for reliability.

### Agreement phase

We adapted Schmidt, Rakoczy, et al.'s (2016) coding approach but sought to obtain two independent dichotomous variables of *agreement* and *disagreement* because any rejection of the proposed sharing norm was of interest regardless of potential additional acceptance in the agreement phase. To this end, children's verbal and gestural responses to the proposer's suggested norm were transcribed on each trial. For the dichotomous measure *agreement*, children received a score of 1 if they showed forms of implicit agreement (e.g., head nodding, verbalizing “Mmh” in approving intonation) or explicit agreement (e.g., “Yes!”, “Okay!”); for all other reactions or no reaction, children received a score of 0. For *disagreement*, children received a score of 1 if they showed forms of implicit disagreement (e.g., head shaking, verbalizing “Mmh” in negatory intonation, making pointing gestures toward the recipient's box) or explicit disagreement such as simple rejections (e.g., “No!”) or alternative proposals (e.g., “We should allocate the stickers this way!”); for all other reactions or no reaction, children received a score of 0. Thus, overall, for each condition children received two independent sum scores (0–2) of both agreement and disagreement. Interrater reliability was very good (Cohen's  $\kappa = .84$ ).



### Test phase

Children's verbal and behavioral interventions were coded as *protest* if they were indicative of children making explicit normative critique or giving clear action directives or prohibitions, all with regard to the protagonist's distributive action. Thus, there were two main subcategories of protest:

1. *Normative protest*, that is, protest, critique, and tattling, making use of normative vocabulary (e.g., "That's wrong," "You have to give two stickers to the child!", "He did it wrong").
2. *Imperative-corrective protest*, that is, directives or prohibitions without normative vocabulary (e.g., "Give it to her!") and/or corrective behavioral interventions (relocating the protagonist's distribution of stickers).

Further behaviors or utterances that lacked the above normative or imperative-corrective properties, but that were related to the protagonist's distributive action, were coded as *hints of protest*; these were more descriptive, nonspecific, and/or ambiguous statements and gestures. Subcategories included non-normative tattling (e.g., informing E1/proposer about the protagonist's action such as "Hans accidentally put all of the stickers in his own box"), informing or asking the protagonist/proposer about a state of affairs (e.g., "There are four stickers/no stickers in there," "You put all of the stickers in your own box," "Two [stickers]?") and/or its consequences (e.g., "Then it's too bad. The other child will be sad"), pointing gestures toward one of the boxes or toward the protagonist, and unspecific disapproval (e.g., "No!", "Uh-uh!", head shaking). All other behaviors were coded as *irrelevant* (i.e., no or irrelevant utterances and behaviors). Interrater reliability was very good (Cohen's  $\kappa = .84$ ). For each trial, children received a binary score of *protest* (a score of 1 if children exhibited at least one of the subcategories of protest and a score of 0 if children exhibited no protest) and a binary score of *hints of protest* (a score of 1 if children performed at least one of the above subcategories and a score of 0 otherwise).

### Action phase

The numbers of stickers shared by children were coded. Interrater reliability was very good (Cohen's  $\kappa = 1$ ).

### Forced-choice evaluation posttest

In the forced-choice test, children received a score of 1 if they identified the prosocial proposer as the "good one" and a score of 0 otherwise. Interrater reliability was very good (Cohen's  $\kappa = 1$ ). In addition, children were asked to justify their decision ("Why [is he the good one]?"). Children's reasoning was categorized as *moral-normative* (e.g., "Because he did it correctly," "Because he acted fairly," "Because the other child will be glad if she/he gets stickers, too"), *descriptive* (e.g., "Because he gave two to himself and two to the other child"), or *irrelevant* (e.g., "Because he is the bigger one"). Interrater reliability was very good (Cohen's  $\kappa = 1$ ).

### Statistical analysis

Statistical analysis was run in R Version 3.5.2 (R Core Team, 2018). To account for the nonindependence of the data (i.e., repeated observations per child), generalized linear mixed models (GLMMs) with binomial error structure and logit link function (Baayen, 2008; Bates, Maechler, Bolker, & Walker, 2015) were used for initial assessment of children's performance in the agreement phase (binary measures of agreement and disagreement) and in the test phase (binary measures of protest and hints of protest). For children's sharing of stickers (mean score = 0–4), we used (general) linear mixed models (LMMs) with Gaussian error structure and identity link function. Models included as fixed effects the predictors age, condition, and norm adherence (for the protest measure only) and the control variables trial order (*z*-transformed) and gender, and they included as random effects participant (random intercept) and condition (random slope by participant to allow participants to vary with respect to this predictor). The random slope of norm adherence (applicable for the protest measure only) was not included because models failed to converge.

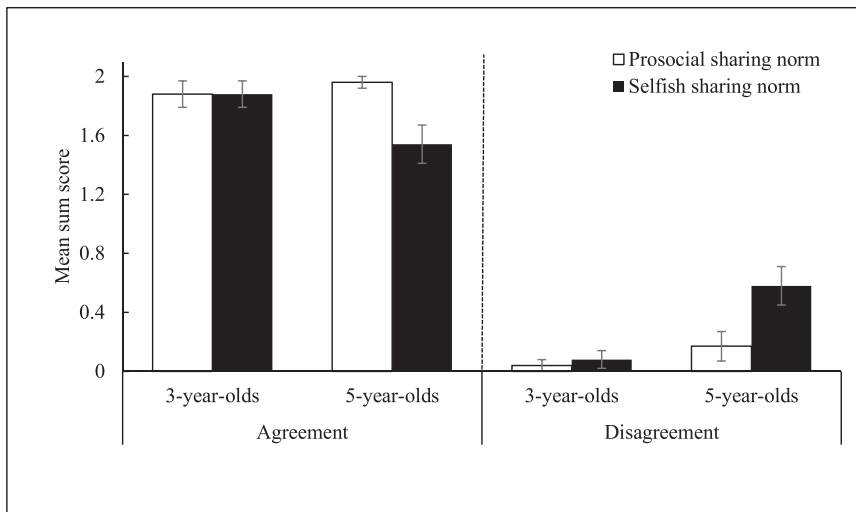


Our analytic approach was as follows. First, we tested for the combined significance of all predictor variables (main and interaction effects) by comparing the fit of the overall full model (including predictor variables, control variables, and random effects) with the fit of a null model that contained only the control variables and random effects using a likelihood ratio test (LRT; Dobson, 2002). The approach of testing the overall full model against a null model helps to protect against Type I error inflation arising from models comprising more than one predictor variable (Forstmeier & Schielzeth, 2011). Second, if this full–null model comparison was significant, we tested for the interaction between age and condition and for age and condition effects by comparing the fit of a full model (including the predictor variables of interest, the control variables, and the random effects) with the fit of a reduced model that did not contain the predictor of interest using an LRT. For the protest measure, the effect of norm adherence could not be reliably estimated given that children performed no protest when the protagonist followed the sharing norm (see Fig. 3 in Results). Unstandardized parameter estimates ( $b$ ), standard errors, 95% confidence intervals (CIs), and odds ratios (ORs) were obtained from the full model. All full–null model comparisons were significant. When models failed to converge, we simplified them, first by omitting the control variable gender and, second, if convergence failure persisted, we instead omitted the random slope of condition. Thus, interaction effects for the measures agreement and protest were based on random-intercept-only models that potentially increase the risk of false positives (Barr, Levy, Scheepers, & Tily, 2013; but see also Matuschek, Kliegl, Vasishth, Baayen, & Bates, 2017) and were followed up based on our a priori predictions. Because models for the specific comparisons within age groups and conditions either yielded imprecise estimates (large standard errors and wide confidence intervals) or were not applicable because there was zero variance for one level of the predictor norm adherence, we used nonparametric statistics for comparisons within age groups. Data are available on request from the corresponding author.

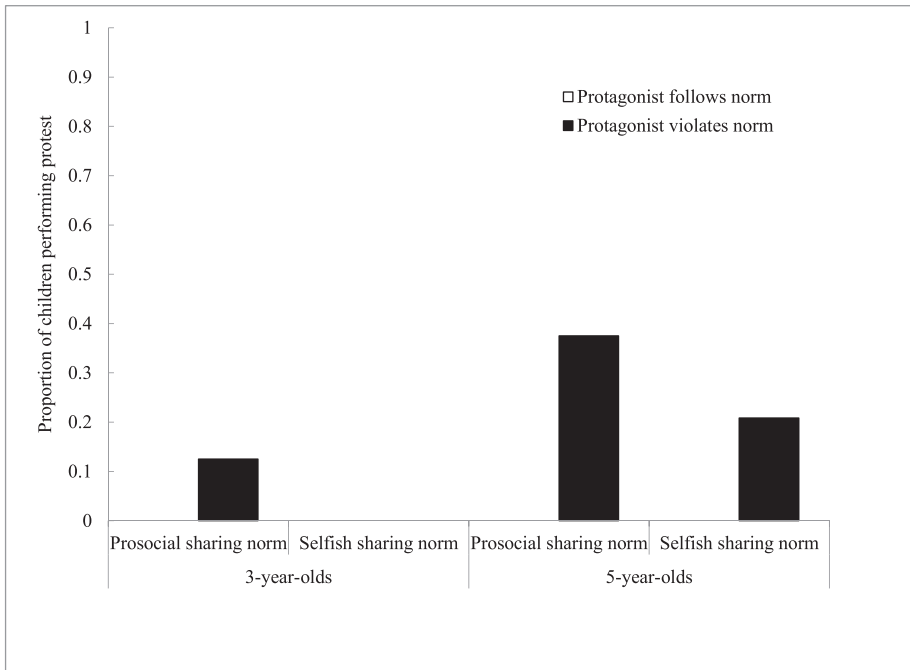
## Results

### Agreement phase

In the agreement phase, children's disagreement and agreement with prosocial or selfish proposals (each over two trials) about how many stickers to share was analyzed (see Fig. 2). Regarding disagreement, binomial GLMMs indicated no significant interaction between age and condition,  $\chi^2(1) = 0.06$ ,



**Fig. 2.** Children's agreement and disagreement with proposed norm (prosocial and selfish) per age group and condition. Error bars indicate standard error of the mean.



**Fig. 3.** Proportions of children ( $n = 24$  per age group) protesting against the protagonist as a function of age and condition (type of sharing norm). The protagonist either followed or violated the prosocial or selfish sharing norm.

$p = .80$ , but significant effects of age,  $\chi^2(1) = 11.95$ ,  $p < .001$ ,  $b = 2.25$ ,  $SE = 0.77$ ,  $CI [0.73, 3.76]$ ,  $OR = 9.46$ , and condition,  $\chi^2(1) = 10.83$ ,  $p < .005$ ,  $b = 6.96$ ,  $SE = 1.58$ ,  $CI [3.85, 10.06]$ ,  $OR = 1053.21$ . Although the interaction effect was not significant, based on our a priori predictions, we ran planned exact Wilcoxon signed-rank tests on children's disagreement (0–2) which revealed that 5-year-olds,  $T^+ = 183$ ,  $p = .01$ , but not 3-year-olds,  $T^+ = 276$ ,  $p = 1$ , rejected selfish proposals significantly more often than prosocial proposals.

Moreover, we assessed children's agreement with prosocial and selfish proposals (see Fig. 2). Binomial GLMMs indicated a significant interaction between age and condition,  $\chi^2(1) = 4.61$ ,  $p = .03$ ,  $b = 3.20$ ,  $SE = 1.59$ ,  $CI [0.08, 6.32]$ ,  $OR = 24.53$ , and that neither age nor condition improved model fit significantly: age,  $\chi^2(1) = 2.26$ ,  $p = .13$ ; condition,  $\chi^2(1) = 3.07$ ,  $p = .08$ . Planned exact Wilcoxon signed-rank tests on children's agreement (0–2) revealed that 5-year-olds,  $T^+ = 385$ ,  $p < .01$ , but not 3-year-olds,  $T^+ = 288$ ,  $p = 1$ , agreed on prosocial proposals significantly more often than on selfish proposals.

### Test phase

Our main question was whether children would enforce agreed-upon sharing norms in response to the protagonist's distributive action (follow vs. violate the sharing norm). Fig. 3 shows children's protest (i.e., normative protest or imperative-corrective protest) against the protagonist for each age group, separated by condition and norm adherence. Given that children performed no protest when the protagonist followed the sharing norm (Fig. 3), we could not estimate the effect of norm adherence (including the three-way interaction of norm adherence, age, and condition) on children's protest with binomial GLMMs. Regarding the other factors, binomial GLMMs on protest revealed no significant interaction between age and condition,  $\chi^2(1) = 0.11$ ,  $p = .74$ , no effect of condition,  $\chi^2(1) = 2.51$ ,

$p = .11$ , but a significant effect of age,  $\chi^2(1) = 3.79$ ,  $p = .03$ ,  $b = 1.73$ ,  $SE = 0.81$ ,  $CI [0.14, 3.31]$ ,  $OR = 5.62$ , suggesting that, overall, 5-year-olds performed more protest than 3-year-olds. Because our main interest lay in children's responses to the protagonist's norm adherence (follow vs. violate) which could not be reliably assessed via the above models, and given our a priori predictions, we ran non-parametric planned comparisons for each age group per condition.

In the prosocial condition, 37.5% of 5-year-olds ( $n = 24$ ) performed protest when the protagonist violated the suggested norm and did not perform any protest when the protagonist followed the suggested norm, and no child showed the opposite pattern (exact McNemar's test,  $p < .005$ ; see also Fig. 3). When controlling for disagreement with the suggested prosocial norm on at least one of two trials, and thereby obtaining a more unambiguous measure of protest (i.e., only count protest of those children who did not show disagreement), still 33% of 5-year-olds protested the violation of the prosocial norm ( $p < .01$ ). In the selfish condition, 21% of 5-year-olds performed protest when the protagonist violated the suggested norm and did not perform any protest when the protagonist followed the suggested norm, and no child showed the opposite pattern ( $p = .063$ ; see also Fig. 3). When controlling for disagreement with the suggested selfish norm on at least one of two trials, 13% of 5-year-olds protested the violation of the selfish norm ( $p = .25$ ).

Regarding the younger age group, in the prosocial condition, 13% of 3-year-olds performed protest when the protagonist violated the suggested norm and did not perform any protest when the protagonist followed the suggested norm, and no child showed the opposite pattern ( $p = .25$ ); in the selfish condition, there was no protest (see also Fig. 3). Further analyses on children's more descriptive and ambiguous behaviors can be found in the online [supplementary material](#).

### Action phase

Table 1 illustrates the mean number of stickers shared by children per age group, condition, and norm adherence. We ran an LMM on children's sharing stickers (mean score = 0–4) and tested for the three-way interaction of age, condition, and norm adherence, which was nonsignificant,  $\chi^2(1) = 0.52$ ,  $p = .47$ . Next, we tested for the two-way interaction effects of age and condition,  $\chi^2(1) = 0.74$ ,  $p = .38$ , of age and norm adherence,  $\chi^2(1) = 0.46$ ,  $p = .50$ , and of condition and norm adherence,  $\chi^2(1) = 15.03$ ,  $p < .001$ ,  $b = 0.81$ ,  $SE = 0.20$ ,  $CI [0.41, 1.21]$ . These results suggest that, regardless of age, children tended to share similar amounts in the prosocial norm condition irrespective of the protagonist's norm adherence ( $M = 1.97$ ,  $SD = 0.60$  and  $M = 1.75$ ,  $SD = 0.67$ ), whereas children shared more stickers in the selfish norm condition when the protagonist violated the norm and shared two stickers ( $M = 1.21$ ,  $SD = 1.13$ ) than when the protagonist followed the norm and shared none ( $M = 0.62$ ,  $SD = 1.02$ ).

### Forced-choice evaluation posttest

The supplemental task consisted of a forced-choice task and a reasoning phase. The second experimenter simultaneously presented the prosocial and selfish proposer puppets and recalled their

**Table 1**  
Mean numbers of stickers (0–4) shared by children, standard errors, and individual data.

Age group	Condition	Norm adherence of protagonist	<i>M</i>	<i>SE</i>	Number of nonsharers ( $n = 24$ )	Number of equal sharers ( $n = 24$ )
3-year-olds	Prosocial	Follows (2:2)	2.00	0.12	1	22
		Violates (4:0)	1.92	0.08	1	23
	Selfish	Follows (4:0)	0.83	0.24	15	8
		Violates (2:2)	1.42	0.20	9	13
5-year-olds	Prosocial	Follows (2:2)	1.96	0.13	1	21
		Violates (4:0)	1.58	0.17	5	19
	Selfish	Follows (4:0)	0.42	0.17	19	5
		Violates (2:2)	1.00	0.20	11	11

**Table 2**  
Children's reasoning about why the prosocial proposer is "the good one"

Age group	Reasoning type			n
	None	Descriptive	Moral-normative	
3-year-olds	9 (75%)	3 (25%)	0 (0%)	12
5-year-olds	1 (5%)	8 (36%)	13 (59%)	22

respective proposals to the children. Then she asked children to decide who "the good one" was. Exact binomial tests (two-tailed) revealed that 5-year-olds (92%,  $p < .001$ ), but not 3-year-olds (50%,  $p = .581$ ), reliably identified the prosocial proposer as the good one.

In the reasoning phase, participants provided justifications for their decisions, which were coded as moral-normative or descriptive reasoning. Justifications of those children who had not identified the prosocial proposer as the good one ( $n = 10$ ) were excluded. An additional 4 children were excluded from the analysis because of experimenter error in the reasoning phase. Therefore, the following analysis was based on 22 five-year-olds and 12 three-year-olds. Results indicated a significant association between age and reasoning in the supplementary task (Fisher's exact test,  $p < .001$ ). Moral-normative reasoning was used more frequently with age (see Table 2).

## Discussion

The current study assessed whether preschoolers agree to and enforce prosocial or selfish sharing norms in a group dictator game, a collective decision-making situation with individual endowments. We found that 5-year-olds, but not 3-year-olds, consented less often to selfish proposals than to prosocial proposals. In addition, 5-year-olds, but not 3-year-olds, also rejected and disagreed with selfish proposals more often than with prosocial proposals. Regarding children's enforcement of agreed-upon sharing norms, we found that whereas 3-year-olds showed little protest or critique when witnessing the protagonist puppet violating the suggested sharing norm (regardless of whether it was prosocial or selfish), 5-year-olds protested more when the protagonist violated a prosocial sharing norm than when the protagonist followed this norm. This effect held when controlling for children's disagreement with the proposed prosocial sharing norm. For the selfish sharing norm, we found no reliable difference in 5-year-olds' protest when the protagonist violated versus followed the suggested norm. With respect to children's own sharing behavior, we found that whereas children followed the agreed-upon prosocial norm (2:2) across age and independent of the protagonist's norm adherence, both age groups showed a tendency to deviate from the selfish sharing norm in altruistic ways when the protagonist violated the norm and shared equally. When the protagonist followed the selfish norm, most children did so as well, but if children deviated, they predominantly chose to share equally. Finally, older preschoolers, but not younger ones, reliably identified the prosocial proposer as good and were more likely to use moral-normative reasoning (e.g., issues of fairness and need) when justifying their decision.

These findings are interesting in several ways. First, they suggest that at preschool age children develop a willingness to agree upon sharing norms and to normatively enforce them even though such norms can be costly. Prior research found that the costliness of a prosocial action—in contrast to negative moral acts (e.g., harming others)—influences school-aged children's judgment of whether it is okay to refrain from the act with no obligation to perform high-cost acts (Kahn, 1992); however, preschoolers seem to put more normative weight on prosocial actions and regard them as obligatory rather than supererogatory (Dahl, Gross, & Siefert, 2020). It is plausible that the prosocial act in the current study was not high cost because children could keep two of four stickers; this, as well as the fact that the recipient would have been sad in case of nonsharing, might have helped children to accept and adopt the prosocial norm. Second, 5-year-olds' stipulation and enforcement of sharing rules in a morally relevant situation depends on the content of the norm (prosocial or selfish); for 5-year-olds rejected a selfish sharing norm more (and accepted it less) than a prosocial sharing norm, and they reliably enforced the prosocial sharing norm only—that is, their enforcement stems not only

from the binding force of the agreement per se (Schmidt, Rakoczy, et al., 2016) but also at least partly from moral considerations such as issues of justice and the welfare of others, similar to what has been found in interview research (Cooley & Killen, 2015; Dahl & Waltzer, 2020; Elenbaas, Rizzo, Cooley, & Killen, 2016; Turiel & Dahl, 2016; Weston & Turiel, 1980). This is remarkable given preschoolers' "difficulty" with costly sharing situations in conventional dictator game scenarios (Fehr et al., 2008; Smith et al., 2013) and their sensitivity to peer pressure or conformity in other contexts (Haun & Tomasello, 2011). Third, the current findings suggest that the judgment–behavior gap regarding resource sharing may close earlier in a collective decision-making situation (in contrast to individual decision making in the dictator game) and, more generally, that such a group situation—underlain by processes of collective intentionality (Schmidt & Rakoczy, 2019; Schmidt & Tomasello, 2012; Searle, 1990)—may raise moral concerns more clearly than an individual resource sharing situation. Even 3-year-olds distributed resources equally in the prosocial trials and shared more resources than agreed on in the selfish condition. This is remarkable given 3-year-olds' typical behavior in dictator games (Blake, McAuliffe, & Warneken, 2014; Smith et al., 2013).

How are we to explain 3-year-olds' lack of norm enforcement and their high rate of agreement with both prosocial and selfish proposals? Could it be that they did not understand the normativity of the collective decision-making situation? This seems unlikely given that 3-year-olds readily stipulate and enforce arbitrary norms (Schmidt, Rakoczy, et al., 2016) and given that the type of sharing norm tended to influence their own sharing behavior. What seems more likely is that 3-year-olds focused more on a competing normative matter, namely, on others' entitlement to decide what to do with their property (Friedman, Pesowski, & Goulding, 2018; Schmidt, Rakoczy, & Tomasello, 2013). Theoretically, prior to any normativity coming from agreement, the sharing scenario in the current study involves at least two major normative perspectives as outlined above: a rights-based perspective (e.g., the right to control one's property but also the right to be treated with benevolence) and a duty-based reading (e.g., the obligation to share according to a norm or even the obligation not to harm others given that the recipient would be sad when receiving nothing in the current study). It is possible that 3-year-olds' high rate of agreement with both prosocial and selfish proposals reflects a property-based entitlement stance on resource sharing rather than merely a yes bias. In addition, although 5-year-olds clearly favored prosocial proposals, they still showed considerable agreement with selfish proposals and many older children did not protest or intervene when the protagonist violated the prosocial norm either. Conversely, both age groups in general showed little disagreement with the proposals. One reason for this may be that the proposer puppets were not introduced as clumsy in the warm-up phase in contrast to the protagonist puppet. Thus, future research could look at how preschoolers balance different normative matters (in particular, individual entitlements vs. obligations toward others in need) in systematic ways.

Furthermore, the fact that we stressed the morally relevant consequences of nonsharing (i.e., recipients would be sad) in the current study as well as children's preconceptions about the moral worthiness of sharing might be reasons for children's overall relatively high sharing rate and their readiness to deviate from the selfish norm (but not from the prosocial norm) when the protagonist did so. If the protagonist followed the selfish norm, however, a considerable proportion of children went with the majority and did not share. These findings corroborate and extend previous research on 5-year-old children's (costly) nonconformity in the face of their peers' selfish behavior toward a needy recipient (Engelmann, Herrmann, Rapp, & Tomasello, 2016).

The individual planned comparisons revealed that 5-year-olds, but not 3-year-olds, showed differential treatments of prosocial and selfish sharing norms regarding both disagreement and protest. Given the nonsignificant interaction effect of age and condition (disagreement) and the noncomputable interaction of age, condition, and norm adherence (protest), caution is warranted regarding the direct comparison of age and condition (and norm adherence) regarding these measures. For disagreement, for instance, we did not obtain statistical evidence that older children's differential disagreement with the two types of sharing norms was significantly different from younger children's disagreement with the sharing norms. In addition, although 5-year-olds showed no reliable enforcement of the selfish sharing norm, there was still a minority (one fifth) that protested when the protagonist violated this norm; and on a liberal measure (combining protest and more descriptive and ambiguous behaviors), a reliable difference was found (although this effect did not hold when control-

ling for disagreement with the suggested selfish sharing norm). Future research could address the question of whether there are stable individual differences in children, with some focusing more on the normativity of agreement than on the content of the agreed-upon norm. Nonetheless, as a group, 5-year-olds clearly favored and normativized only the prosocial sharing norm from the agreement to the test phase of the experiment. Lastly, the protest measure we used provides strong evidence for normative understanding (Schmidt & Rakoczy, 2018, 2019) but is also demanding, which may at times result in low overall protest rates (e.g., Schmidt, Rakoczy, et al., 2016); in the current study, a bit more than one third of 5-year-olds (i.e., 9 children given the rather small sample size) protested violations of the prosocial sharing norm.

The current study involved children in a highly structured norm-creation situation (Schmidt, Rakoczy, et al., 2016), which allowed for experimental control but also comes with drawbacks. For instance, it would be interesting to pair children with actual peers (see, e.g., Hardecker, Buryn-Weitzel, & Tomasello, 2019) and to assess their preferred sharing norm (with minimal instruction) under a variety of conditions (e.g., recipients' need, resource scarcity and value, anonymous sharing). Moreover, because the proposer puppet iterated the suggested norm when children first rejected the proposal, this might have led some children, especially in the selfish sharing norm condition, to give up their resistance and to put more weight on the agreement per se and conformity than on moral concerns. Hence, future work could use a more open norm-creation paradigm to investigate children's reasoning in a collective decision-making situation. Another important aspect pertains to the role of cultural background and setting (e.g., rural vs. urban) in children's propensities and normative attitudes in a collective decision-making situation as investigated here. One possibility is that one may find similarities in preschoolers' prosocial preferences and normative attitudes but may find cultural differences in older children (Blake et al., 2015; House et al., 2013; for a review, see Legare, 2019).

Taken together, the current study provides the first evidence that older preschoolers agree to and enforce nonarbitrary sharing norms and that they pay attention to the content of the norm, accepting and establishing a prosocial (costly) sharing norm only. Thus, the judgment-behavior gap might close earlier in some contexts, such as collaborative ones (Blake et al., 2014), including a collective decision-making situation with morally relevant consequences as investigated here. These findings add important knowledge to the literature on children's understanding of how norms can come into existence and suggest that—when moral issues are at stake—novel norms gain their force not only through agreement or expectations of conformity but also through considerations of the content of the proposed norms.

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## Author contributions

M.F.H.S. supervised and provided funding for the project. M.F.H.S. designed the study. J.P.F. contributed to the design of the study. J.P.F. conducted the study, and J.P.F. and M.F.H.S. analyzed the data. Both authors interpreted the results and drafted the manuscript. M.F.H.S. provided critical revisions. Both authors approved the final version of the manuscript for submission.

## Appendix. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jecp.2021.105303>.

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