BRIEF REPORT

Young Children's Reputational Strategies in a Peer Group Context

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Reputational concerns are known to promote cooperation. Individuals regularly act more prosocially when their behavior is observable by others. Here, we investigate 4- and 5-year-old ($N = 144$) children's reputational strategies in a competitive group setting. The aim of the current study was to explore whether children's sharing behavior is affected by the future possibility of being singled out publicly as the most generous or, alternatively, the least generous member of the group. Children were told that they could share stickers with other children and that the picture of either the (1) most generous or (2) least generous donor would be displayed publicly. In both conditions, children shared significantly more than in a control condition. Moreover, 5-year-old, but not 4-year-old children's sharing was affected more by the possibility of being presented as the most generous than being presented as the least generous member of the group. This study is the first to show that children as young as 4 invest in their future reputation and that by age 5 children flexibly apply different reputational strategies depending on context.

Keywords: reputation management, prosocial behavior, cooperation

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Humans often regulate their behavior in anticipation of evaluation by others. In cooperative interactions, people regularly adjust their sharing or helping behavior in order to appear prosocial and to avoid appearing antisocial. As a consequence, individuals behave more prosocially when their behavior is observable and thus public (Hardy & Van Vugt, 2006; Milinski, Semmann, & Krambeck, 2002b; Van Vugt & Hardy, 2010). The opportunity to

engage in such reputation management has been shown to increase cooperation in a wide variety of contexts (Milinski, 2016; Nowak & Sigmund, 1998, 2005). A positive reputation as a cooperator entails a suite of long-term benefits, such as access to resources and other cooperators, or higher group status (Milinski, Semmann, & Krambeck, 2002a; Nowak & Sigmund, 2005; Wedekind & Milinski, 2000). On the other hand, individuals perceived as antisocial risk a reputation for defection and, in extreme cases, ostracism and rejection by the group (e.g., Boehm, 2012). Experimental studies have shown that the threat of ostracism increases cooperation rates in public goods games (e.g., Feinberg, Willer, & Schultz, 2014).

Institutions across societies make use of this characteristic of human behavior to promote prosociality; for example, charities may reward generous contributors by publishing their names. The prospect of gaining a positive reputation is driving people's willingness to donate more. Likewise, the fear of being evaluated negatively is considered a deterrent to antisocial behavior; public shaming, for instance, is an integral part of many of the world's criminal justice systems, as evidenced by the disclosure of names or even pictures of drug offenders and other criminals. Here, the fear of developing a negative reputation serves as a deterrent to antisocial behavior (Fessler, 2007). Research with adults has provided evidence that the possibility of being singled out publicly does in fact increase cooperation levels. For instance, in a study by Jacquet, Hauert, Traulsen, and Milinski (2011), the possibility of being singled out as the most or least generous donor in a coop-

erative interaction increased contributions to a public goods game. Nothing is known about whether and when in early ontogeny such an incentive structure increases cooperation.

A large body of research has demonstrated that children engage in prosocial behaviors from an early age (for an overview, see Martin & Olson, 2015; Warneken, 2015), and recent research indicates that from about 5 years of age, children's prosociality shows the signature of self-promotional strategies: increased prosociality in public compared to private settings (for a review, see Engelmann & Rapp, 2018). For instance, 5-year-old children are more generous when donations are visible to the recipient (Leimgruber, Shaw, Santos, & Olson, 2012) and share more when being observed by a peer (Engelmann, Herrmann, & Tomasello, 2012; Engelmann, Over, Herrmann, & Tomasello, 2013). Being watched has also been shown to deter preschoolers from antisocial behavior like cheating or stealing. In a study by Piazza, Bering, and Ingram (2011), 5- to 6-year-old children cheated less in a throwing game when they thought their behavior was observed by an invisible supernatural agent compared to when they believed they were unobserved. Likewise, 5-year-old children were more likely to refrain from stealing when they were watched by a peer compared to when they were alone (Engelmann et al., 2012). These two sets of studies suggest that by age 5, children (1) invest resources strategically to gain and maintain a positive reputation and (2) inhibit socially unacceptable behavior when being watched and thereby avoid a negative reputation.

A number of open questions remain with regard to the development of reputational concerns in young children. First, nothing is known about whether singling out the most or least prosocial individual promotes children's sharing and whether children use different strategies depending on whether the most or least prosocial individual is singled out. Second, it remains unclear whether children understand that their reputation—positive or negative—is not absolute but always contingent on the reputations of members of an appropriate reference group (Barclay, 2013). For example, whether a particular donation leads to reputational gain or loss is relative depending on what others contributed. Donating $10 to charity might be perceived as generous and therefore result in a positive reputation when other donors gave $1. However, if other donors were to offer $100, $10 would seem like a very small donation, making the donor seem less charitable. As a consequence, individuals actively try to outcompete others for a good reputation (also known as "competitive altruism"); (Hardy & Van Vugt, 2006; Roberts, 1998). To our knowledge, no previous study has investigated how young children manage their reputation in a peer group setting where their reputation depends on others' behavior.

In addition, previous research has not addressed the question of whether preschoolers incur costs in anticipation of future reputational benefits. Previous studies with children have mainly used observational paradigms in which participants are directly observed by a peer while sharing resources (e.g., Engelmann et al., 2012, 2013; Leimgruber et al., 2012). However, managing one's reputation implies more than attending to the immediate presence of others. To successfully manage reputation, individuals often have to adjust their behavior in anticipation of a group's future evaluation (e.g., Sperber & Baumard, 2012). While nothing is known about children's reputation management in anticipation of future evaluations, previous work from a different line of research has shown that at least by age 4, children realize that people adjust their behavior in anticipation of future events (Lagattuta, 2007).

Around the same age, children make decisions that benefit a future but not the present self (Atance, 2008; Moore, Barresi, & Thompson, 1998). Moreover, 5-year-old children (but not 3-year-old children) share more with potential reciprocators, suggesting that they consider future benefits they might obtain from sharing in the present and adjust their behavior accordingly (Sebastian-Enesco & Warneken, 2015). This raises the possibility that children at this age might also invest in their future reputation.

Relatedly, at what age do children start investing in their reputations? The question of whether children younger than age 5 adjust their behavior so as to create a particular impression remains largely unexplored. Fu, Heyman, Qian, Guo, and Lee (2016) found that 5-year-old children, but not 3- or 4-year-old children, attempt to maintain a positive reputation (they cheated less when they were told that they had a positive reputation). Four-year-old children resisted longer before they cheated, possibly indicating a developmental change around this age. A recent study with younger children showed that already 3-year-old children shared more generously in the presence of pictures of eyes, but only if they had been previously familiarized with images of eyes (Kelsey, Grossmann, & Vaish, 2018). Taken together, very few studies have investigated whether children younger than 5 invest in their reputation, and no previous study has explored the extent to which children between the ages of 4 and 5 use different reputational strategies.

The current study was designed with these questions in mind. Our aim was to investigate whether children's sharing behavior is affected by the future possibility of being singled out publicly as the most generous or, alternatively, the least generous member of the group. Groups of four children played a minidictator game. Each participant received 10 stickers and could donate as many stickers as they liked to children in a different kindergarten. In addition, children were told that one participant's picture would be displayed publicly among them at the end of the donation event. This picture could be of the most generous individual (*positive reputation condition*), the least generous individual (*negative reputation condition*), or a randomly chosen group member without reference to sharing (*control condition*). In this competitive group context, we expected different strategies for gaining a positive reputation compared to avoiding a negative reputation. In the *negative reputation condition*, donating an average number of stickers suffices in order to successfully blend in and not be detected. The *positive reputation condition*, on the other hand, incentivizes exceptional prosocial behavior, that is, behavior that exceeds the average. Based on this, we predicted that average donations should be higher in the *positive reputation condition* than in the *negative reputation condition*.

In order to investigate whether children younger than 5 years of age actively invest in building a positive reputation and avoiding a negative one, and to further investigate developmental changes regarding children's reputational strategies in these age groups, we tested 4- and 5-year-old children in the current study.

Method

Participants

The final sample comprised 72 four-year-old children (mean age = 4.58 years, age range = 4.2–4.98 years) and 72 five-year-old children (mean age = 5.36 years, age range = 4.94–5.77

years). Children were tested in groups of four (two girls, two boys) that consisted exclusively of 4-year-old or 5-year-old children. We randomly assigned children to one of three conditions (24 children per condition with equal number of boys and girls). Children within each group were acquainted with each other since they attended the same kindergarten. Four children were chosen randomly from their corresponding kindergarten group and then randomly assigned to conditions. The sample size was determined prior to data collection, on the basis of typical sample sizes in the field. A posteriori power analysis revealed a power of 1, indicating that the conducted model (see analysis) in combination with the given sample size provided sufficient power.

Three additional groups (4-year-olds: $n = 1$; 5-year-olds: $n = 2$) were tested but excluded from the final sample because group members made their sharing intentions public. In addition, 22 children from different groups had to be excluded because they did not pass the manipulation check (4-year-olds: $n = 11$; 5-year-olds: $n = 2$), did not comprehend the allocation procedure (4-year-olds: $n = 1$; 5-year-olds: $n = 1$), were influenced by other participants' public announcements as to how much they shared or will share (4-year-olds: $n = 4$; 5-year-olds: $n = 1$), and due to experimenter error (4-year-olds: $n = 1$; 5-year-olds: $n = 1$). Participants were recruited and tested in their day care centers in a midsized German city (population approximately 500,000). Children (predominantly White Caucasian) came from mixed-economic backgrounds. Informed consent was attained for all children from their parents.

Setup and Materials

Children were seated next to each other at a distance of 150 cm in separate compartments, which were divided by 130 cm × 113 cm opaque barriers (to ensure independent behavior). They faced a so-called *picture box*, a cardboard box (39 cm × 89 cm × 23 cm) with a window (18 cm × 22 cm) displaying the screen of a tablet computer (9.7-in. Apple iPad 2). To make the *picture box* more salient, each compartment was visually connected with the box via white masking tape on the floor (see Figure 1). Each compartment contained one yellow and one blue tube. To prevent children from talking while allocating their resource, children wore noise-
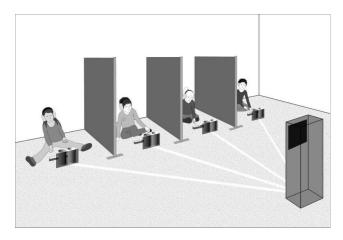

Figure 1. Study setup with a group of four children during the sharing event.

cancelling earmuffs (3M Peltor Kid). Children were given 10 small yellow plastic containers (Ø 4 cm), each filled with one sticker.

Design and Procedure

We employed a between-subjects design, in which groups of four children were randomly assigned to one of three conditions (*control condition, positive reputation condition,* and *negative reputation condition*). For practical reasons, children were assigned to their compartments and familiarized with the setup in pairs (one girl, one boy). A female experimenter (henceforth E) entered the room with the first pair of children and assigned one compartment to each child. E then explained the function of the two tubes positioned in their compartments. She said that the blue tube and everything it contains belonged to the participant. The yellow tube and everything it contains belonged to children in a different kindergarten. Participants were then asked to identify their own tube and the other kindergarten's tube. In case of misidentification, E repeated the introduction and asked again. After this, all children identified the tubes correctly. Finally, children were instructed how to use the noise-cancelling earmuffs. After that, the first pair left the room and the second pair entered the room (who had been waiting outside the testing room with a second experimenter). Children were assigned their compartments in such a way that boys and girls were seated in alternating order in each of the conditions. Apart from the assigned positions, the same familiarization procedure was repeated for the second pair of children. After the second pair had left the room, all four children reentered the room as a group accompanied by E.

First, E introduced the *picture box* to the group and took a picture of each child (using the front camera of the tablet). She explained that they would need these pictures later. Children were asked to sit in a half circle next to the *picture box*. E sat down in front of the group. She introduced the allocation task by showing 10 small plastic containers and explaining that each of them contained one sticker and that each child would receive 10 stickers. To avoid individual differences in preference for the stickers, children were never shown the actual stickers. Children were told that they could keep them and take them all home or share some with children in a different kindergarten who do not have any stickers. Children were told to place the (closed) containers they wanted to take home in their tube (i.e., blue tube) and that they could share some of their containers with the other kindergarten by placing them in the other tube (i.e., yellow tube). Children were thus free to share all, none, or any other number of their containers (and ultimately stickers).

Second, E explained that after the allocation procedure, the picture of one participant would be depicted on the screen. Children in the *positive reputation condition* were told that the picture of the participant who shared most of his or her stickers would appear on the screen. In the *negative reputation condition,* children were told that the picture of the participant who shared least of his or her stickers would be shown. Finally, in a *control condition,* children were told that the picture of one random participant would be shown on the screen.

In all conditions, this step was followed by a manipulation check to ensure full comprehension of the procedure. First, E asked each child individually "what will be shown later on the screen of the picture box?" If a child did not answer the question correctly

(depending on condition: the one who donated most, least, or a random picture), E asked directly whether the picture of the participant who had donated most, least, or just any picture would be displayed. Children who were unable to answer the question received a second explanation of whose picture would be presented on the screen later and were asked the same question again ("What picture will be shown on the screen?"). Children who could still not answer the question correctly after the second explanation were excluded from the final sample.

Next, children entered their previously assigned compartments and E handed out 10 plastic containers to each child. Once all children had received their resources, E reminded children of the allocation procedure and repeated that they would later see the picture of the participant who donated most (*positive reputation condition*), the picture of the participant who donated least (*negative reputation condition*), or a randomly chosen picture (*control condition*). For the exact phrasing of the manipulation, please refer to the online supplemental material.

E emphasized that only the group (i.e., the four children) would see the picture since she would leave the room and only come back later. Children then put on their earmuffs and E left the room. E watched from outside via a DV-Walkman and reentered the room after all children had allocated their containers.

Children who did not start allocating their containers or opened them were reminded of the allocation procedure. In this case, E reentered the room and repeated the instructions regarding the allocation procedure to the corresponding child. Children who did not allocate their containers after the second instruction were excluded from the final sample. Once children had finished allocating, E reentered the testing room.

Since we did not want children to feel uncomfortable, no picture was actually displayed on the screen after allocations had been made. Upon reentering, E announced that the picture box seemed to be malfunctioning due to technical problems and resolved the situation. The full procedure of the study was approved by the Max Planck Institute for Evolutionary Anthropology Ethics Committee (study title: "Young Children's Reputational Strategies").

Coding and Reliability

The number of stickers donated to the other kindergarten—that is, the number of containers put into the other kindergarten's tube—was coded from tape by a coder who was blind to condition and hypothesis. A second coder coded a random 25% of the sample. Interrater reliability was excellent (Cohen's $\kappa = .93$).

Analysis

We conducted a generalized linear mixed model (Baayen, 2008) with binomial error structure and logit link function. The model was fitted in R (Version 3.2.0; R Core Team, 2015) using the function glmer of the R package lme4 (Bates, Maechler, Bolker, & Walkers, 2014).

To test whether condition affected 4- and 5-year-old children's sharing behavior differently, we included the interaction of condition and age group as fixed effect. To control for *gender, sitting position* (center or edge), and *manipulation check* (spontaneous answer or upon request), we included these three factors as addi-

tional fixed effects. To control for the particular group children were tested in, we included *group* as random effect. Since we used a binomial error structure, we also included *child ID* as random effect. For more details on the control variables, see the online supplemental material.

Results

The effect of condition on children's sharing behavior differed between 4- and 5-year-old children, $p = .066$ (please find estimates and standard errors of all terms included into the model in the online supplemental material). To explore developmental changes with regard to context sensitivity (acquiring a positive vs. negative reputation), we analyzed age groups separately. Four-year-old children shared significantly more in the *positive reputation condition* ($\bar{x} = 4.7$ stickers) than children in the *control condition* ($\bar{x} = 2.4$ stickers), $b = 1.2$, $p < .001$, and significantly more in the *negative reputation condition* ($\bar{x} = 3.9$ stickers) than in the *control condition*, $b = 0.78$, $p < .05$. Four-year-old children's sharing did not differ between the *positive reputation* and the *negative reputation condition*, $b = -0.44$, $p > .05$.

Likewise, 5-year-old children in the *positive reputation condition* ($\bar{x} = 5.8$ stickers) shared significantly more than children in the *control condition* ($\bar{x} = 1.5$ stickers), $b = 2.42$, $p < .001$, and significantly more in the *negative reputation condition* ($\bar{x} = 3.9$ stickers) than in the *control condition*, $b = 1.52$, $p < .001$. In contrast to 4-year-old children, 5-year-old children's sharing also differed significantly between the *positive reputation* and *negative reputation condition*, $b = -0.9$, $p < .01$ (see Figure 2 and Table 1 in the online supplemental material for more details on the number of stickers shared by participants).

Gender had no effect on children's sharing behavior, $b = -0.29$, $p > .05$.

Discussion

Four- and 5-year-old children's donations increased significantly when they anticipated the revelation of (1) the most generous donor or (2) the least generous donor to the group. Furthermore, for the 5-year-old children, we find that the increase in generosity varies in these two cases. Children in this age group who expected the most generous donor to be presented donated significantly more than children expecting the least generous donor to be revealed. In contrast, 4-year-old children did not share differentially depending on whether they expected the most generous or the least generous donor to be presented to the group. These findings are, to our knowledge, the first to show that the prospect of being singled out as the most prosocial as well as the possibility of being singled out as the least prosocial serves as an incentive for children to act less selfishly. Moreover, this is the first study to provide evidence that by age 4, children already invest in their future reputation as cooperators.

Our results yield further evidence for young children's investment in their reputation and extend earlier results in important ways. Previous studies have shown that 5-year-old children attempt to appear prosocial (for an overview, see Engelmann & Rapp, 2018). Our findings suggest that by age 4, children also attempt to stand out as the most prosocial and avoid appearing as the least prosocial. Second, contrary to previous studies, children
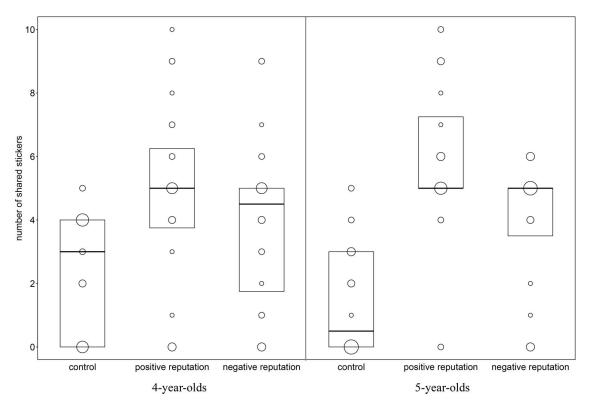
Figure 2. Number of stickers children donated, separated by condition and age group. Data points are depicted by dots, with bigger dots representing more data points. Each box represents a quartile. Horizontal lines within quartiles represent medians.

were not tested in a direct observation paradigm in which children are, for example, observed as they distribute resources. Instead, in the present study, children had to anticipate future evaluation by the group and regulate their behavior accordingly—a cognitively more complex form of reputation management. Modifying one's behavior in the direct presence of an audience is simpler than anticipating how different courses of action (e.g., donating few vs. many stickers in the current study) will be evaluated by the group as this involves an abstract simulation of potential responses. Third, we aimed to disentangle two motives for increased sharing in public contexts: gaining a positive reputation and avoiding a negative reputation. The present study shows that both motivations form part of 4- and 5-year-old children's reputational strategies. Moreover, for 5-year-old children, the possibility of acquiring a positive reputation led to higher donations than the threat of developing a negative reputation.

This raises the question of why the anticipation of a positive reputation promotes 5-year-old children's sharing behavior more than the anticipation of a negative reputation. One explanation could be that children incur greater costs (i.e., shared more resources) in the former case because holding a positive reputation serves as a greater incentive than avoiding a negative reputation. In line with this explanation, a number of studies have shown that individuals tend to give positive information more weight than negative information. Such a "positivity bias" has been documented in children's evaluations of themselves and others (for a review, see Boseovski, 2010) and could explain a stronger moti-

vation to gain a positive reputation. For instance, children put greater valence on positive information than negative information when making trait attributions (Boseovski & Lee, 2006) and prioritize positive over negative information when they make predictions about an actor's future behavior (Lagattuta & Sayfan, 2013). Consequently, the possibility of being presented in a positive light could serve as a stronger incentive than being associated with negative information (i.e., being the least generous).

Alternatively, the difference between conditions in the 5-year-old children could also be the result of different strategies for gaining a reputation as the most generous, compared to avoiding a reputation as the least generous. In the *negative reputation condition,* avoiding labeling as selfish requires children to meet some minimum standard of what is socially expected. In other words, it suffices to blend in and stay in the midrange of donations. In contexts where exceptional behavior is incentivized through the public acknowledgment of highly cooperative individuals, on the other hand, children attempt to stand out. Thus, in the *positive reputation condition,* in order to successfully outcompete others for the positive reputation, an individual's donation must exceed the average. This difference could explain why children donated more when they anticipated the revelation of the highest contributor. In fact, our results reflect this behavioral pattern. In the *negative reputation condition,* the highest donations did not exceed six stickers. In the *positive reputation condition,* on the other hand, 29% of children donated more than six stickers.

This interpretation could also explain the reported age difference. It is possible that younger children's reputation management is less strategic in the sense that they do not yet vary their reputational strategies depending on context (as proposed above). This explanation accords well with findings showing that children, as they grow older, become increasingly sensitive to different audiences when they manage their reputation (Banerjee, 2002a; Engelmann et al., 2013; Watling & Banerjee, 2007). In addition, older children might have developed advanced prospective thinking abilities. This might allow them to anticipate what other children might donate and then adjust behavior accordingly (i.e., donate more than they expect others to donate). In line with this interpretation, Sebastian-Enesco and Warneken (2015) found that 5-year-old but not 3-year-old children adjusted their prosocial behavior depending on whether they could expect future benefits from the recipient. It should be noted, however, that in the current study, the effect of the Age × Condition interaction was slightly above conventional levels of significance and should therefore be treated with caution ($p = .066$).

Importantly, children's behavior in the current setup is not explainable simply in terms of winning a game and having one's picture displayed. While children might have been motivated to see their picture in the *positive reputation condition,* this cannot explain their behavior in the *negative reputation condition*. In this condition, children shared significantly more stickers (than in the *control condition*) to not have their picture displayed. In addition, at no point during the familiarization was the setup introduced as a game. Rather, neutral language was used throughout the procedure. Children were told in a neutral way that the child who donated most or least would be displayed. The fact that children donated more in a context where the child who donated least would be displayed (*negative reputation condition*) implies that children independently made the relevant inferences and consequently avoided being singled out in this context. The current results show that by age 4, children understand that being singled out can be "good" in one context but "bad" in another.

Our results raise interesting questions about the cognitive and motivational forces underlying children's concern for reputation. The ability to represent other people's minds seems to be crucial to a developing concern for reputation because creating a particular impression often involves *thinking about what others think of us* (e.g., Banerjee, 2002b). In addition, children also need to *care* about the image they create and be motivated to adjust their behavior accordingly. One possibility is that children's cognitive ability to foresee the potential reactions of others to their behavior is combined with the burgeoning motivational force of anticipated feelings of honor and shame. Being singled out publicly as antisocial has been associated with feelings of shame (Fessler, 2007). Indeed, modifying one's behavior in anticipation of shame protects one from the group's devaluation and therefore functions as a deterrent of antisocial behavior (Sznycer et al., 2016). Being singled out as prosocial, on the other hand, has been linked to feelings of honor, and the anticipation of such feelings is thought to promote human cooperation (Fessler & Haley, 2003; Jacquet et al., 2011). In the present study, children could have refrained from donating little or nothing due to anticipated feelings of shame. Likewise, the expectation of being honored in front of the group might have served as an incentive for children to donate more than they usually would. Research on the development of self-conscious emotions suggests that preschoolers have a growing understanding of honor and shame (Kagan, 2005; Tracy, Robins, & Lagattuta, 2005). Given these findings, it is conceivable that anticipated feelings of honor and shame already play an important role in how children present themselves to their peers. Future studies should investigate more directly the relationship between a prosocial or antisocial reputation and feelings of honor and shame in young children.

The fact that we did not systematically control the relationships of children within their groups of four is one limitation of the current study. It is reasonable to assume that, reputationally speaking, interacting with a group of familiar peers is different from interacting with a group of unfamiliar peers. For example, it is possible that a group of familiar peers—on whom one will depend in future interactions—exerts a stronger incentive to make a good impression. Along the same lines, Engelmann and colleagues (2013) found that 5-year-old children invest more in their reputation with ingroup members. Future research should directly compare children's impression management with groups of familiar versus groups of unfamiliar peers. Relatedly, it remains an open question of how children manage their reputation with peers compared to adults. Studies have shown that the presence of an adult observer (Piazza et al., 2011; Shaw et al., 2014) as well as a peer observer (Engelmann et al., 2012, 2013; Leimgruber et al., 2012) increases children's prosocial behavior. However, no study has directly compared these two contexts. There is some initial evidence that children use flattery behavior regardless of whether the recipient was a peer or an adult (Fu & Lee, 2007) but that children expect others to be more modest around peers than adults (Watling & Banerjee, 2007). With age, children become more apt at tailoring their reputational strategies to a specific audience (Banerjee, 2002a), suggesting a growing understanding that a certain action can improve one's image with one audience but not necessarily with another. Given that preschoolers not only value and prefer but also reward generous individuals (e.g., Kenward & Dahl, 2011), it is reasonable to assume that children in our setup are motivated to present themselves as generous to their peers and are not simply motivated to please the adult (children were also told that the adult experimenter would not see the picture in the end; see procedure).

A second limitation of the current study is the relatively high dropout rate of the younger children. Running a study with groups of four 4-year-old children is challenging for the experimenter and the participants, and so some individuals had to be excluded from the final sample because they were distracted by the other children during the allocation procedure. Moreover, a number of 4-year-olds had difficulties with answering the manipulation check questions correctly. It is conceivable that younger children failed the manipulation check more often due to the amount of information (e.g., regarding the allocation procedure, how the *picture box* works) they had received. To confirm our findings with the younger age group, future research should design simpler behavioral studies that allow for testing 4-year-old and even younger children.

The current findings have practical implications for attempts to promote prosocial behavior in kindergartens or classrooms. Similar to companies that motivate employees by singling out the "employee of the month," kindergartens and schools could implement incentive structures for prosocial behavior by singling out "helpers of the month." Such incentives, however, should be used

with moderation and caution. Reputational benefits are one of many reasons why children are motivated to help, and focusing solely on this motivation could supplant other motivations, like a genuine concern for others' well-being. In addition, it is important to point out that children in the current paradigm started off with the same amount of resources, thus providing them with equal chances to be singled out for their generous behavior. This is not always the case in real-world settings, where sharing resources might be differentially costly for children. Independent of these practical considerations, our results suggest that the prospect of being singled out as the most prosocial as well as the prospect of being singled out as the least prosocial has a strong effect on children's motivation to share from at least the age of 4 onward.

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