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Preschool-aged children's responses to unfairness and subsequent sharing behavior in dyadic contexts

Emily Kim[1] | **Vanessa LoBue**[2] | **Gretchen Van de Walle**[2]

[1]University of Toronto, Toronto, Canada

[2]Rutgers University - Newark, Newark, New Jersey, USA

Correspondence
Emily Kim Department of Psychology, University of Toronto, Toronto, M5S 1A1, Canada.
Email: emilyyrkim@gmail.com

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Abstract

Recent research implicates the importance of social and contextual factors in children's fair behavior. Here, we explored the social and emotional influences that might contribute to fair behavior in young children. We examined 79 pairs of 3- to 5-year-old children (N = 158; 85 female; M = 4.3 years; Range = 3.03–5.54) in a naturalistic sharing interaction to measure their verbal, emotional, and behavioral responses to an unfair distribution of rewards, as well as their subsequent sharing behavior. Children who received fewer rewards responded verbally, behaviorally, and emotionally as predicted, protesting the unfair distribution. However, children who received more rewards either failed to notice their partner's responses, or they failed to consider these responses when given the chance to behave prosocially and correct the unfair distribution. The only cue that predicted prosociality was a negative affective response from the disadvantaged peer.

KEYWORDS
fairness, prosocial behavior, sharing, social-cognitive development

1 | INTRODUCTION

1.1 | Fairness across development

A sense of fairness is fundamental to human morality, as it facilitates cooperation, which is essential for creating and maintaining social relationships. Research suggests that humans display a preference for fairness even in infancy. Indeed, infants as young as 12 months prefer fair distributors over unfair distributors, and even share their resources with others, some at a cost to themselves (Geraci & Surian, 2011; Schmidt & Sommerville, 2011). In the preschool years, children display a strong preference for equal distributions of resources (Smith et al, 2013)—a preference that remains robust throughout the lifespan. In fact, adults in some cultures around the world are even willing to punish others at a cost to themselves to avoid unfair outcomes (Henrich et al., 2005).

Importantly, children not only display *preferences* for fairness at an early age, but there is also evidence that they have an early developing *conceptual understanding* of fairness. By age 3, children verbally endorse fairness norms, explicitly applying the principle of equality in third-party resource distributions. As children get older, their understanding becomes more complex, and by age 5 to 6, they begin to endorse *equity* norms, believing that those who work hard are most deserving of resources, and protesting when more resources are distributed to wealthy over poor individuals (Baumard et al., 2012; Wörle & Paulus, 2018). Further, 6- to 8-year-old children will even throw away resources if they are unable to distribute them equally (Shaw & Olson, 2012).

However, despite evidence in the literature of an early developing understanding of fairness, most studies have focused on the cognitive mechanisms that drive children's responses to unfair situations; far less work has investigated children's fairness-related behavior in a social context. The most common behavioral measure of children's fairness is sharing, or resource distribution. At first blush, it would appear that—like preferences for fair behavior—sharing behavior also appears early in infancy. By 8 months, infants exhibit sharing behaviors, offering their toys to others (Rheingold et al., 1976). By age 2, they engage in altruistic, prosocial behaviors, such as helping adults with chores or helping them pick up and find lost items (Rheingold, 1982; Warneken & Tomasello, 2006). However, when preschool-aged children are faced with the choice of giving coveted resources to others or keeping those resources for themselves, young children frequently display selfish, unfair behaviors, such as fighting with a sibling over a toy or unfairly distributing resources (Blake et al., 2014; Dunn & Munn, 1987), even a explicitly stating that they themselves should share resources equally (Smith et al., 2013). In economic games where players are given the opportunity to allocate resources to a recipient under a variety of circumstances, 4-year-old children make choices that maintain their advantage over their peers, and do not reject advantageous but unequal distributions until the age of about 8 (Blake & McAuliffe, 2011; Blake et al., 2015; Shaw & Olson, 2012).

1.2 | Social predictors of fair behavior

Despite knowing that they *should* distribute resources equally, children often choose to behave selfishly (Kogut, 2012; Smith et al., 2013). This suggests that while children's understanding of fairness develops on one timeline, their fair behavior likely develops on another, and that over the course of the lifespan, *knowledge* about fairness may not be the only factor that determines whether we *behave* fairly (Blake, 2018). One factor that has been widely examined in the fairness literature is the social context in which one must behave fairly. For example, when engaging in prosocial behaviors, children consider whether someone is watching them, sharing more with others when someone is present in the room than when no one is observing (Engelmann et al., 2012; Leimgruber et al., 2012). Children also consider their personal affiliation to an individual, sharing more with friends (Chen et al., 2013; Olson & Spelke, 2008; Yu et al., 2016) and with collaborators than with strangers (Corbit, 2019, 2020; Hamann et al., 2011; Warneken et al., 2011). Further, 4-year-old children consider their own preexisting wealth when sharing, and they share more with recipients who would not threaten their own relative wealth (Kirkland et al., 2020, 2021).

Peers' emotions have also been shown to predict whether children behave prosocially. A recent study reported that children judge the fairness of a distribution based on the emotional response of a disadvantaged recipient (Stowe et al., 2022). Likewise, preschoolers behave more generously if they are induced to feel emotions like empathy (Williams et al., 2014) or guilt (Gummerum et al., 2010; Vaish, 2018). In a series of studies, Paulus and Moore (2015, 2016) reported that preschool-aged children understand the emotional consequences and benefits of sharing, and claim that sharing leads to more positive emotions, while not sharing leads to negative emotions. This knowledge of emotional consequences—particularly the knowledge that not sharing would lead to some form of negative affective consequence—resulted in more generous sharing behavior.

1.3 | Sharing in real-world contexts

In the real world, sharing is social, complex, and dynamic, leaving open the possibility that other people's behavioral responses may affect children's own sharing behavior. For example, several studies have reported that children's verbal and behavioral responses to an unfair distribution of resources varies based on a variety of social factors, including age, sex, and whether the child was at an advantage compared to their partner (e.g., LoBue et al., 2010; Rakoczy et al., 2016). In some of the few studies examining sharing behavior with pairs of children, Birch and Billman (1986) and Rao and Stewart (1999) found that US children rarely correct an unfair distribution spontaneously, sharing resources only when requested by a peer. In contrast, Hamann et al. (2011) and Warneken et al. (2011) found that when tested in pairs, the majority of 3-year-old children share resources without prompting, and passively adjust unfair distributions by taking some resources and leaving the rest for their partners.

Unfortunately, much of the literature on the socioemotional factors that influence sharing behavior fail to capture these nuanced, complex interactions due to methodological limitations. For example, many studies of children's understanding of fairness and fair behavior use third-party allocations, where children are asked to distribute resources to others at no cost to themselves. When given no context about the recipients, and when allocating resources comes at no cost to the child, children behave in accordance with what they know about fairness and allocate resources equally (Olson & Spelke, 2008). In other words, by 3 years of age, when given the opportunity to distribute resources among *others*, children do so fairly. However, in the real world, young children themselves are more commonly interacting among the possible recipients of shared resources. In such situations, where sharing comes at their own expense, children must cope with the temptation of keeping resources for themselves. In this kind of first-party context, children are still able to articulate that they *should* share their resources, but 3-year-old children nonetheless behave selfishly, choosing to distribute resources in their own favor (Callaghan & Corbit, 2018; Fehr et al., 2008; Smith et al., 2013).

Additionally, in real-world contexts, children are not typically asked to share in a single encounter with a stranger. Individuals who interact only once have more to gain by behaving selfishly and letting others take a loss, as they are likely to incur few social repercussions (House, 2018). However, most experimental paradigms examining children's sharing behavior are designed so that children are asked to share with puppets, photographs of other children, or hypothetical, fictional children (Fehr et al., 2008; Smith et al., 2013). And in the few studies where recipients were physically present (e.g., Blake & McAuliffe, 2011), they were typically strangers. Children often exchange resources with people they already know and will meet again, such as in school or at home. Thus, an experimental design that includes a familiar social partner is important for the investigation of the real social and contextual cues that are available for children to consider when given the opportunity to share.

1.4 | The current study

Given the lack of research on the dynamic social interactions that *naturally* occur when children share with a peer, we also lack an understanding of the social and emotional factors that influence children's reactions to unequal

distributions in dyadic situations. The current study will address this important gap in the literature by investigating the social-emotional contexts of sharing behavior in pairs of preschool-aged children. More specifically, we examined how a disadvantaged child's responses to an unfair distribution predicted prosociality from an advantaged peer when given the opportunity to share.

Preschool-aged children were matched with a same-aged peer and presented with an unfair distribution of rewards, as in previous research (LoBue et al., 2010). Next, we added a novel free sharing task where children were presented with additional rewards to distribute among themselves. Altogether, this task allowed us to examine children's spontaneous responses to an unfair distribution and how that initial unfair distribution (and the disadvantaged child's responses to it) relates to children's subsequent sharing behavior. We assessed how children reacted verbally, emotionally, and behaviorally to the unfair distribution, and how these responses influenced subsequent sharing behavior.

In line with previous research, we expected children to display better fairness understanding with age. More specifically, we expected children's verbal responses to reflect a greater conceptual understanding of fairness with age, with older children more often providing correct verbal responses to fairness-related questions than younger children. When examining children's behavior when they are given an additional set of resources to share among themselves, we hypothesized that with age, children would behave more equitably, correcting the initial unfair distribution. This is in line with work by Rizzo and Killen (2016), who reported that when presented with a third-party unequal distribution, it was not until 5 years of age that children distributed resources equitably.

However, we also expected to see group differences between the disadvantaged and advantaged groups, regardless of age. Specifically, we predicted that disadvantaged children would protest the unfair distribution more often than their advantaged counterparts across the age range. Similarly, when examining children's behavioral responses, we expected disadvantaged children to look at their partners' stickers more often during an unfair distribution, and to react more negatively to the unfair distribution than the advantaged children, consistent with previous research (LoBue et al., 2010). Further, we expected to see a relation between the disadvantaged children's verbal and behavioral responses following the initial distribution and the advantaged children's later sharing behavior, with greater negative responses from the disadvantaged child predicting greater prosociality from the advantaged child. Altogether, we expect the findings of this study to add to the literature on children's behavioral responses to inequity in a social context, and to provide some of the first data on how children's behavioral responses to an unfair distribution relate to their subsequent sharing behavior.

2 | METHODS

2.1 | Participants

Participants included 158 3- to 5-year-old typically developing children (85 female; M = 4.3 years, SD = .7; Range = 3.03–5.54) recruited from preschools in the Newark, New Jersey area. There was no a priori power analysis, but we ran a post-hoc power analysis on the results of our analysis examining age and advantage predicting the number of stickers taken from the shared pile with an alpha of .05 and found a power of .996. Sample size was based on LoBue et al. (2010) which used a similar method. Based on their sample size, we aimed to collect 31 pairs of children for each age group (3-year-olds, 4-year-olds, and 5-year-olds). However, the onset of the COVID-19 pandemic stopped data collection before we could finish collecting the full sample of 5-year-olds (17 pairs were collected in total). As a result, all analyses were conducted with age as a continuous variable, instead of categorically by year.

The Rutgers University Institutional Review Board approved all procedures, and parental consent and demographic information was obtained before testing. Participants were tested in age-matched pairs from the same classroom and were gender-matched when possible. Of the 31 pairs of 3-year-olds, 22 pairs were matched in gender. Of the 31 pairs of 4-year-olds, 25 pairs were matched in gender. Of the 17 5-year-old pairs, 13 pairs were matched in gender. We ran

TABLE 1 Demographic information.

Child race/ethnicity						
Black/African American	White/European American	Asian/Asian American	Latino/ Hispanic	Multiracial	Other	Declined to respond
23 (14.56%)	43 (27.22%)	7 (4.43%)	25 (15.82%)	13 (8.23%)	10 (6.33%)	37 (23.42%)
Parent education						
Advanced degree	Bachelor's degree	High school degree	Declined to respond			
1 (0.63%)	40 (25.32%)	68 (43.04%)	49 (31.01%)			

separate analyses for the gender matched pairs and the unmatched pairs and found no differences. Eighteen additional pairs of children were tested but excluded from analyses due to experimenter error (11), equipment failure (1), non-compliance (3), failure to understand the task (1), or because they did not speak English (2). In each pair, one child was randomly assigned to be the disadvantaged child (receive one sticker) and the other to be the advantaged child (receive four stickers). The assignments and order in which the stickers were distributed (advantaged or disadvantaged child first) were counterbalanced within each age group. Table 1 presents demographic data for the final sample.

2.2 | Procedure

Pairs of participants were brought to a private area in their preschool or daycare. Before proceeding with the unfair distribution of rewards, each child was individually given a set of tasks (Give-N Task and Emotion Identification Task) while the other child played nearby with a second experimenter. Because the study took place in preschools, having a second experimenter was necessary to supervise one child while the second child was completing their set of tasks. These tasks were completed individually and allowed for the children to become comfortable with both experimenters. After these initial tasks, the second experimenter sat behind the camera at a distance from the children during the distribution phases of the study to reduce any potential effects their presence might have on children's responses.

2.3 | Give-N task

Participants took part in a version of the Give-N task (Wynn, 1990; Sarnecka & Carey, 2008) to assess participants' ability to count, as children's understanding of the cardinal principle (the idea that when counting objects, the last number counted indicates the number of total objects) predicts fair sharing behavior (Chernyak et al., 2016). The experimenter presented each participant with a pile of small wooden stars and requested that they place one, four, or five stars in a container. If a child chose an incorrect number of stars, the experimenter removed the stars and laid them out in front of the child. She then asked the child to count the stars. If the child again counted incorrectly, the experimenter counted with the child and said, "But I asked for X stars. Can you put X stars in the bucket for me?" Children who placed the correct number of the stars for two out of three trials were judged to be able to note that the distribution during the Distribution Task differed between the two children. We expected to see age-related differences and that their performance would predict their verbal response to whether the unfair distribution was okay. However, we do note that for a difference of 4:1, children can use the ratio to recognize the inequality, and cardinality is mostly required for correcting the distributions and counting the final amounts.

2.4 | Emotion identification task

To determine whether the participants could use emotion labels, participants were shown a set of seven emoticons (neutral, happiness, sadness, anger, fear, surprise, and disgust) and were asked how the person depicted in each felt. This task was designed to ensure that the participants could accurately produce emotion labels relevant to the interview question "How does that make you feel?" (Gao & Maurer, 2010). Children who failed to label the happy, angry, and sad emoticons in this pretest (emotions typically related to an unfair situation) were excluded from subsequent analyses on the emotion question in the interview.

2.5 | Distribution task

The distribution task was adapted from LoBue et al. (2010), which was based on a task by Birch and Billman (1986), both of which used pairs of familiar children to examine sharing behavior. After the pretests, the experimenter seated the two children next to each other and placed a container in front of each child, explaining that she had stickers to give to them as a reward for playing the pre-test games. To create a very clear inequity between participants, we used the distribution protocol described by LoBue et al. (2010)—distributing one sticker to one (disadvantaged) participant and four stickers to a second (advantaged) participant. Further, the experimenter counted the stickers aloud to emphasize the inequity, saying, "One sticker for [Disadvantaged Participant], and one sticker for [Advantaged Participant], two stickers for [Advantaged Participant], three stickers for [Advantaged Participant], and four stickers for [Advantaged Participant]." If either child took a sticker from the partner's pile or attempted to give the partner a sticker from his/her own pile during this distribution process, the experimenter placed the sticker(s) back in the original owner's pile, saying "This is [child]'s sticker(s)," maintaining the originally assigned four to one sticker distribution, so that we could examine behavioral responses to the same unfair distribution across participants.

After a 5 s pause, the experimenter then asked a series of interview questions to probe participants' cognitive and emotional response to the unequal distribution. To examine whether children's verbal responses systematically predicted their subsequent sharing behavior, each question was asked to both children at once and was repeated to the child who did not answer first. Specifically, the experimenter asked (1.) "Is this okay? Why or why not?" (2.) How many stickers do you have? (3.) Do you have the same number of stickers? (4.) Is that okay? (5.) Is that fair? Why or why not? (6.) How does that make you feel? If a child gave an incorrect answer to "How many stickers do you have?", the experimenter and child counted the stickers together correctly afterward.

2.6 | Free share task

After the interview, participants were asked to put their stickers away in their respective containers. Then, they were asked to help a second experimenter clean up the toys that they played with during the pretest tasks. After, the first experimenter brought both participants back to their seats with their respective containers (each containing the previous distribution of stickers, 1 vs. 4) and said, "Since you helped me clean up the toys, you get even more stickers. You can share them amongst yourselves." She then placed a pile of five new stickers between the two children. After waiting approximately 5 s after the children had divided the stickers, the experimenter then removed the stickers the children received earlier from their containers, and combined them on the table with the children's new pile of stickers so that each child's total number of stickers (from the first and second distributions) was now visible. She then asked the participants another series of questions. Again, she asked both children at the same time (1.) "How many stickers do you have? (2.) Do you have the same number of stickers? (3.) Is that okay? (4.) Is that fair? Why or why not? (5.) How does that make you feel? (6.) Why did you share the stickers that way?" The experimenter ended the task by adding stickers to the pile of the child who had ended up with fewer stickers so that both children finished the study with the same number of stickers.

TABLE 2 Codes for the responses to the "why" questions inquiring about the reasoning behind children's responses to "Is it ok?," "Is it fair," and "Why did you share the stickers this way?"

Code	Description
Fairness	Child used the words "fair" or "equal," or explicitly indicated that it was a fairness problem.
Desire	Child explicitly stated desire for stickers (e.g., "Because I want four" or "I want more!")
Implicit comparison	Child pointed out either the number of his/her own stickers, or how many his partner had, without mentioning fairness. (e.g., "because she has four" or "I only have two" or "I don't have enough") These responses are implicit objections to the inequality of the situation, and therefore seem likely to mark inequality aversion
Obligation	Child referred to a general responsibility to share. (e.g., "My mom/teacher told me I have to share" or "Because she's my friend")
Emotional concern	Child pointed out their partner's [potential] emotional response. (e.g., "Because she will be sad")
Unsure/other	Child claimed not to know or if a response did not meet any of the categories above. (e.g., "I don't know" or "Because my mom wants a sticker)

2.7 | Coding

All sessions were recorded so that the participants' faces and the stickers were clearly visible. Trained research assistants used Datavyu (2014; datavyu.org), a behavioral coding software system, to code verbal, behavioral, and affective responses.

2.8 | Verbal coding

Yes, no, maybe, and "I don't know" responses were recorded for "Is this okay?" and "Is this fair?" The responses to the "why" questions inquiring about the reasoning behind children's responses to "Is it ok?," "Is it fair," and "Why did you share the stickers this way?" were coded for fairness, desire, implicit comparison, obligation/responsibility, and emotional concern-related responses, similar to LoBue et al. (2010) (see Table 2). Children who did not provide a response were excluded from analyses. If a child's response to the "why" questions fit with more than one code, the response was coded as the category that suggested a higher-level understanding of fairness. Fairness and implicit comparison-related responses (in this order) were coded over any additional responses, as they were indicative of an understanding of fairness.

An additional coder randomly coded 40 participants (25.32%). Cohen's Kappa (κ) was used to establish interrater reliability. Cohen's Kappa was .75 for "Why is it (not) fair?" and .84 for "Why did you share the stickers that way?"

2.9 | Behavioral coding

2.9.1 | Looking behavior

To evaluate whether participants attended to the number of stickers and to their partners' affective responses during the initial sticker distribution, we coded whether each child looked to their partner's stickers and faces, beginning when the last sticker was placed on the table, since this is the point at which it was clear that the stickers were unevenly distributed, and ending immediately before the experimenter asked the first interview question. A look was defined as beginning when the child's gaze was directed toward the target for at least 300 ms, the minimum amount of time for an

infant to process and plan a directed gaze given a stimulus (Haith et al., 1993). If the child's face was not clearly visible during the task, they were excluded from coding. If it was unclear whether the child was looking, the coder and the primary researcher discussed until a code was agreed upon. Interrater reliability for 40 randomly selected participants (25.32%) yielded a Cohen's Kappa of .78 for looks to the partner and .86 for looks to the partner's stickers.

2.9.2 | Affect

We also coded shifts in children's affective responses, specifically whether their affect became more positive, more negative, or remained constant from the beginning of the distribution to the end. We did so by coding affect when the first sticker was placed on the table and then again immediately before the experimenter asked the first interview question. Three affective states were coded: positive, negative, and neutral. A positively-valenced facial expression was defined as smiling, indicated by raised corners of the mouth and raised cheeks. A negatively-valenced facial expression was defined as frowning, indicated by lowered corners of the mouth or furrowed brows. If the child's face was not clearly visible during the task, they were excluded from coding. If the affect was not clearly recognizable, the coder and the primary researcher observed and discussed until a code was agreed upon. Interrater reliability for an additional 40 participants (25.32%) yielded a Cohen's Kappa of .77 for shifts in affect. For "How does that make you feel," children's responses were coded as negative (e.g., sad), non-negative (e.g., happy), "I don't know," or other irrelevant responses.

2.9.3 | Transfers

To evaluate children's attempts to distribute the stickers, we recorded every transfer of sticker each child made during the free share task, to or from either their own pile or the shared pile. Additionally, we recorded the number of stickers in each child's possession at the end of the testing session.

3 | RESULTS

First, we asked whether there was verbal, behavioral, and emotional evidence that the children noticed the unfair distribution, and whether there were age-related differences in these results. We did this by running a series of logistic and linear regression analyses. For each analysis, a three-stage hierarchical design was employed using three models: model 1 predicted the responses from age, model 2 predicted the response from advantage (condition), and model 3 predicted the responses from the interaction of age and advantage. If the children recognized that the distribution was unfair, we expected to see a main effect of advantage, with the disadvantaged children responding more strongly to the unequal distribution than the advantaged children. If these responses changed with age, we expected a main effect of age, and/or an interaction with age.

Second, we asked whether the disadvantaged children's responses to the unequal distribution would predict the advantaged children's sharing behavior in the free-share task. We did this by running a second series of regression analyses. For each analysis, we ran a two-stage hierarchical design using two models: model 1 predicted the advantaged children's behaviors by age so that model 2 could predict the advantaged children's behaviors from those of the disadvantaged children, controlling for age.

For each analysis described below, we highlight significant models and whether there was a significant improvement in fit in subsequent models after adding additional predictors. We also provide a table for the full model (including both significant and non-significant effects) in each analysis in the Supplemental Materials.

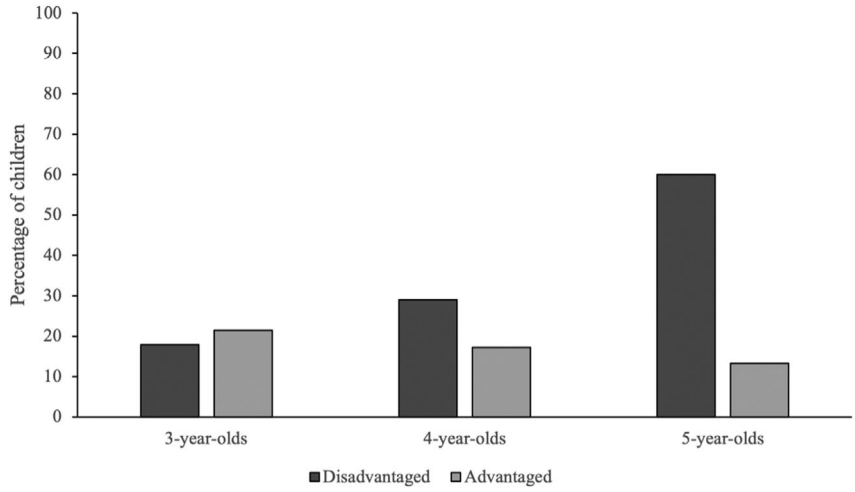

FIGURE 1 Percentage of children who respond "no" to "Is this okay?" after the initial unfair distribution by age and group.

3.1 | Verbal

To examine age-related differences in children's fairness knowledge and behavior, we first analyzed whether age and advantage predicted children's verbal responses. We analyzed the questions that were most indicative of children's conceptual understanding of fairness and sharing. First, we examined children who provided yes or no responses to the second "Is this okay?" prompt after the initial unfair distribution of stickers ($N = 146$), as this question was asked after establishing that the children were given an unequal number. Any other responses (e.g., "I don't know") were excluded from these analyses ($n = 2$) because they did not clearly indicate a correct or incorrect answer to the question. Although age alone did not yield a significant model, but the addition of advantage yielded a marginally significant effect, $\chi^2(2) = 5.90$, $p = .052$, with 23 of the disadvantaged children (31.1%) claiming that the unfair distribution was not okay, compared to only 13 of the advantaged children (18.1%). The addition of the interaction of age and advantage yielded a significant model, $\chi^2(3) = 10.07$, $p = .018$. Breakdown of the interaction indicates that, "no" responses increased with age in the disadvantaged group and decreased with age in the advantaged group (see Figure 1).

Next, we examined children's yes or no responses to "Is this fair?" after the initial unfair distribution of stickers ($N = 157$). None of the models were significant, as only about half the children across both groups said that the distribution was not fair, possibly suggesting a lack of understanding of the word "fair."

We then examined children's responses to "Why isn't it fair?," if they said that the initial distribution was unfair. Responses indicating an understanding of inequality (coded as fairness or implicit comparison) were grouped together ($n = 32$), while all other non-fairness relevant responses were grouped ($n = 44$). Only age yielded a significant model, $\chi^2(1) = 6.95$, $p = .008$; 13 5-year-olds (68.4%) provided fairness related justifications, compared to only 9 3-year-olds (33.3%) and 10 4-year-olds (33.3%; see Figure 2).

Finally, we examined children's responses to "Why did you share the stickers this way?" after the free share task. Again, responses coded as fairness or implicit comparison were grouped together ($n = 22$), while all other non-fairness related responses were grouped ($n = 109$). Only age yielded a significant model, $\chi^2(1) = 8.32$, $p = .004$, with 3 3-year-olds (6.4%), 11 4-year-olds (19.6%), and 8 5-year-olds (28.6%) providing fairness-related responses (see Figure 2).

3.2 | Looking

Overall, children did not look often at their partners' faces; only 16.5% of all the children looked at their partners' faces during the first distribution. None of the models were significant. Total of 66.5% of children looked at their partners'

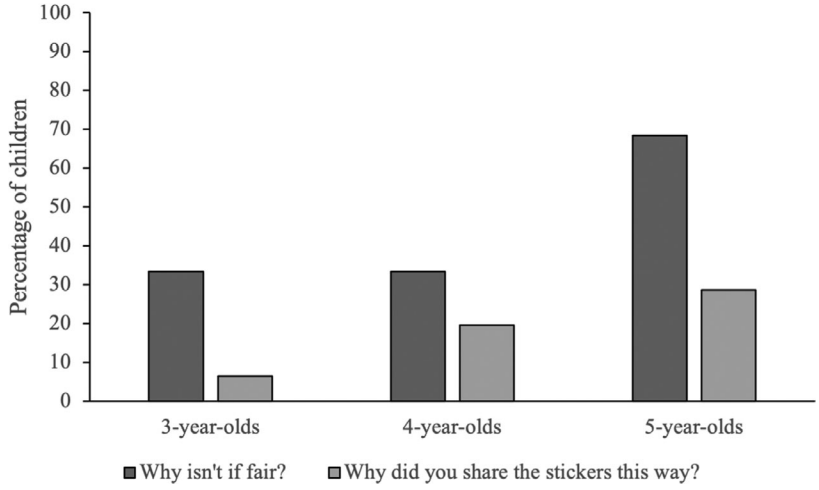

FIGURE 2 Percentage of children who provide fairness or implicit comparison-related responses to "Why isn't it fair?" and "Why did you share the stickers this way?

stickers. The addition of advantage resulted in a significant model, $\chi^2(2) = 11.07$, $p = .004$; disadvantaged children looked at their partners' stickers significantly more often (78.5%) than the advantaged children (54.4%).

3.3 | Affect

Next, we examined whether age and advantage predicted affective responses to the initial unfair distribution. We examined this in two ways. First, we examined the shifts in children's affect during the distribution by categorizing children into two groups. The negative group consisted of children who shifted to a more negative state from the beginning of the distribution to the end ($n = 22$), and the non-negative group consisted of those who were consistent in their affective responses or those who moved to a more positive state ($n = 101$). Within this group, 79 children displayed no shift in affect and 22 children displayed a positive shift in affect. The shifts were coded in this way because a positive shift in affect from the disadvantaged children was rare ($n = 6$) and the other affective shifts between both the disadvantaged and advantaged children were not informative to our hypotheses. When comparing these two groups, age did not yield a significant model, but the addition of advantage did, $\chi^2(2) = 16.51$, $p < .001$. As expected, more disadvantaged children ($n = 19$; 31.7%) displayed a negative shift in affect than the advantaged children ($n = 3$; 4.8%) during the unfair distribution.

Second, we examined children's responses to "How does it make you feel?" after the initial unfair distribution. Only children who passed the emotion pretest were included ($N = 124$). Responses were separated by negative responses ($n = 28$) and non-negative responses ($n = 94$). Age yielded a significant model, $\chi^2(1) = 4.82$, $p = .028$; 8 3-year-olds (20%), 10 4-year-olds (18.5%), and 10 5-year-olds (35.7%) provided a negative response. The addition of advantage also resulted in a significant improvement in fit, $\chi^2(1) = 4.72$, $p = .030$. As expected, more disadvantaged children (n = 19; 31.7%) provided a negative response than the advantaged children ($n = 9$; 14.5%).

3.4 | Distribution of stickers in free share task

We next examined how stickers were distributed during the free share task. First, we examined the number of stickers taken from the shared pile. Most children ($n = 136$) engaged in taking behavior across both groups, with 72

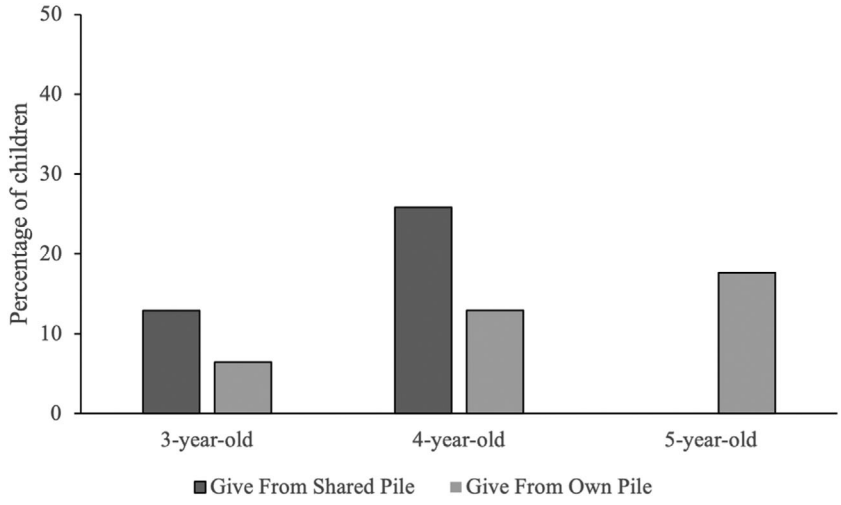

FIGURE 3 Percentage of types of giving behavior by advantaged children. Less than 50% of each age group did not engage in any type of giving behavior. The figure is displayed on a bigger scale to clearly display age differences.

disadvantaged children (91.1%) and 64 advantaged children (81.0%) taking stickers from the shared pile. Age was not a significant predictor of this behavior. A significant result was found with the addition of advantage to the model, $F(2, 155) = 10.40$, $p < .001$, $R^2 = .12$; on average, disadvantaged children took more stickers ($M = 2.8$, SD = 1.3) than the advantaged children ($M = 1.8$, SD = 1.3).

Next, we examined whether age predicted whether the advantaged child gave to the disadvantaged child during the free share task, either from the shared pile or from their own pile. The result was not significant. It is worth noting that when examining age categorically and breaking down the types of giving behavior, we see an increase from age 3 ($n = 4$; 12.9%) to 4 ($n = 8$; 25.8%) of giving stickers from the shared pile. However, none of the 5-year-olds gave stickers from the shared pile. When looking at stickers given from their own pile, two of the advantaged 3-year-olds (6.5%), four of the advantaged 4-year-olds (12.9%), and three of the advantaged 5-year-olds (17.6%) give stickers from their own pile (see Figure 3).

Finally, we ran a linear regression to see how age and advantage predicted the number of stickers each child ended up with at the end of the study. A significant result was only found with the addition of advantage to the model, $F(2, 155) = 41.74$, $p < .001$, as well as with the addition of the interaction of age and advantage, $F(3, 154) = 29.90$, $p < .001$, and both improved in fit in comparison to the prior model (see Table S11). On average, the disadvantaged group ended up with fewer stickers ($M = 4.2$, $SD = 1.0$) than the advantaged group ($M = 5.7$, $SD = 1.1$). Interestingly, with age, the advantaged group ended up with *more* stickers (3-year-olds, $M = 5.5$, $SD = 1.2$, 4-year-olds, $M = 5.8$, $SD = 1.1$, 5-year-olds, $M = 5.9$, $SD = .7$), while the disadvantaged group ended up with fewer (3-year-olds, $M = 4.4$, $SD = 1.2$, 4-year-olds, $M = 4.1$, $SD = 1.0$, 5-year-olds, $M = 4.06$, $SD = .7$).

3.5 | Responses predicting subsequent transfer behavior

Finally, using a series of regressions, we examined whether the behaviors of the disadvantaged children in the distribution task predicted the advantaged children's behavior in the free-share task. For each analysis, we ran a hierarchical regression with age and the predictor variable to control for age. Only one analysis yielded significant results, and all non-significant results and trends are described in the Supplemental Materials.

The one analysis that did yield a significant result was the shift in the disadvantaged partner's affect predicting the number of stickers taken by the advantaged partner during the free share task, $F(2, 57) = 4.88$, $p = .011$, $R^2 = .15$. Although most children did not look at each other's faces, affective responses are expressed in multiple modalities that were not all accounted for (facial, vocal, behavioral). Thus, we included all pairs in which a disadvantaged child displayed a negative shift in affect during the distribution task ($n = 19$). Of pairs where the disadvantaged child displayed a negative shift, the advantaged children took an average of 1.1 stickers ($SD = .9$) while partners of those who displayed a nonnegative shift in affect ($n = 41$) took an average of 2.2 stickers ($SD = 1.4$).

4 | DISCUSSION

In the current study, preschool-aged children provided verbal, behavioral, and emotional responses to an unfair distribution of resources. As predicted, the greatest age-related differences were in children's verbal responses, with older than younger disadvantaged children claiming that the unfair distribution was "not okay," and with older than younger children explicitly appealing to notions of fairness when explaining why the distribution was "not okay." While children's understanding of the word "fair" seems to still be developing (as suggested by the lack of fairness-related responses when asked "why is not fair?"), finding that older children in the disadvantaged group increasingly expressed that the unfair distribution was "not okay" suggests that children's conceptual understanding of fairness is still developing in the preschool years.

In contrast, we did not find age-related differences in children's emotional and behavioral responses to inequality, suggesting that even children as young as 3 respond negatively to an unfair distribution. This is consistent with previous research (LoBue et al., 2010). More specifically, disadvantaged children were more likely to look at their partners' stickers than the advantaged children, providing behavioral evidence that these children noticed the unfair distribution. Disadvantaged children also responded to the distribution with more negative shifts in affect, and with more negative verbal responses. Further, advantaged children took fewer stickers from the shared piled in the second distribution than their disadvantaged counterparts, consistent with previous research on passive sharing (Warneken et al., 2011).

It is noteworthy, however, that although advantaged children took *fewer* stickers from the shared pile than disadvantaged children, they still took *some* stickers from the shared pile despite already having an advantage over their partners, thus maintaining their advantage until the end of the study. Only taking one sticker from the shared pile would have resulted in equalizing the final distribution, but advantaged children instead took an average of two stickers, consistent with previous work suggesting that children's charitable behavior is largely affected by their relative advantage (Blake & McAuliffe, 2011; Kirkland et al., 2020; 2021. In the rare instances where the advantaged children gave stickers to their disadvantaged partners, there was a trend for younger children to give mostly from the shared pile at no cost to themselves, while older children were more likely to give from their own pile, at their own expense.

Interestingly, the only significant predictor of the advantaged partners' behavior during the free share task was their disadvantaged partners' negative shift in affect. One possible explanation for this finding is that a clearly negative response from a social partner can trigger empathic distress. This possibility is supported by previous literature. For example, in a study by Williams et al. (2014), children as young as 3 behaved more prosocially after watching a video of a little girl in distress than after watching a video of a girl who was not distressed. Further, in the same study, 5- to 6-year-old children's prosociality was positively correlated with their empathic concern for the little girl.

Importantly, in the current study, while children's shifts in affect were related to subsequent behaviors, their explicit verbal protests were not. This suggests that simply knowing a peer is unhappy may not be as impactful on behavior as observing a peer's emotional responses. Emotional cues seem to be a more salient and thus influential component to take note of in an unfair dynamic, and suggest room for further examination, particularly in social contexts. For example, although Williams et al. (2014) only found a correlation between empathic concern and prosociality and not

personal distress, future studies can examine whether this is still the case in the presence of an upset peer, where the presence of negative affect may cause distress and thus, drive sharing behavior.

While this study sheds light on children's understanding of fairness and their behavior, it is important to note several limitations. First, the presence of the experimenter(s) might have affected children's behavior in some way. For example, the fact that an unfamiliar adult distributed the stickers to the children may have influenced children's responses. Specifically, it is possible that some of the disadvantaged children protested less than they would have in a more naturalistic situation to avoid challenging an adult experimenter. However, even if children's responses were dampened to some extent, the disadvantaged children still showed negative responses to the unequal distribution across *all of our measures* (emotional, verbal, and behavioral) suggesting that they were still willing to express their unhappiness with the distribution despite the presence of an authority figure. Similarly, in the instances where children tried to share or take stickers during the initial distribution, experimenters placed the sticker back to its original owner, possibly suggesting to children that the uneven distribution was acceptable. Conversely, the presence of the experimenter during the free share task may have encouraged some of the advantaged children to share more than they otherwise might have, as children behave more prosocially when they are being watched (Engelmann et al., 2012; Leimgruber et al., 2012). However, despite some sharing in the free-share task, advantaged children still maintained their advantage over their peers, suggesting that their desire for stickers might have been stronger than any desire to please the experimenter.

Another limitation of this study is that only 66.5% of children looked at their partners' stickers during the distribution, and even fewer looked at their partners' faces, leaving open the possibility that children did not recognize the uneven distribution. We think that this is unlikely, as the experimenter counted aloud the number of stickers that each child had during the distribution and later established the uneven distribution during the interview questions. However, we cannot completely rule out the possibility that children of this age could be overstimulated from receiving stickers and as a result, pay little attention to stickers other than their own.

Despite these limitations, this study provides several important insights into the dynamics of early sharing behavior. First, despite the presence of an adult experimenter, this study shows that disadvantaged children clearly express their unhappiness when being given fewer resources than a peer, and that they express this unhappiness in multiple ways (behaviorally, emotionally, and verbally). Second, our data show that regardless of several cues suggesting that a disadvantaged peer is unhappy with their resources, advantaged peers maintain their advantage, mostly sharing at no cost to themselves (if at all). Finally, the presence of negative affect was the only cue related to the advantaged child's sharing behavior. This suggests that children are starting to take note of emotional information when making decisions about prosocial actions in the preschool years.

Altogether, our dynamic and naturalistic sharing paradigm highlights some of the components of social context that are most related to children's decisions to share. By as early as three years of age, children who are treated unfairly respond verbally, behaviorally, and emotionally to an unfair distribution of resources. However, despite their partners' clearly negative reactions, the advantaged children either did not attend to or ignored these cues. Indeed, most children did not even look at their partner's faces during the initial distribution, and most of those who did still failed to share, maintaining an advantage over their partners. This suggests that the cues from a social partner may not be sufficient to elicit prosocial sharing from preschool-aged children. However, we did find some nonsignificant trends with age, suggesting that the use of these social cues is only beginning to develop in the preschool years, and thus opens the door for future research in this domain for older age groups.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

The author has provided the required Data Availability Statement, and if applicable, included functional and accurate links to said data therein.

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