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“Who is Worthy of My Generosity?”

Recipient Characteristics and the Development of Children's Sharing

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### Abstract

Previous research has shown that the majority of 8-year-old children share valuable resources equally with others, whereas 4-year-olds are more likely to favor themselves in their sharing allocations. In this study, we examine whether these patterns of sharing behavior are affected by the needs of the recipient or by the recipient's previous moral or immoral actions. One-hundred and sixty 4- and 8-year-old children had the opportunity to share stickers with hypothetical recipients who were assigned varying characteristics. For both age groups, sharing increased when recipients were needy (i.e., feels sad or has few toys) and morally deserving (i.e., shares with other children and does not push). The differentiation of sharing based on recipient characteristics increased between 4 and 8 years of age, with 8-year-olds also demonstrating decreased sharing when recipients were morally undeserving (i.e., has pushed other children and does not share). Our findings provide evidence that children show increased sharing with recipients who are morally deserving and those who demonstrate need. This suggests that children indirectly reciprocate others' past moral behavior and behave more altruistically towards those with higher need.

*Keywords:* Sharing, moral behavior, altruism, dictator game

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Sharing resources with others is an important feature of human social behavior (Markovits, Benenson, & Kramer, 2003) and one that represents an individual's willingness to consider fairness, equity, and the needs of others (Ongley & Malti, 2014). When conducted anonymously, sharing is often altruistic, that is, motivated by concern for others or by internalized moral values (Carlo, 2006) and, in the act of sharing, the benefit to others is weighed against the cost to the self (Camerer, 2003; Eisenberg & Fabes, 1998). The decision to share a valuable resource with another requires a degree of prioritization of the other's interests over one's own, and, because the sharing of resources is inherently costly, we are often selective as to upon whom we bestow benefits (Cosmides & Tooby, 1992).

The present study sought to contribute to the refinement of existing theories of children's distributive justice and to examine the influence of recipient characteristics on the development of children's costly sharing (i.e., sharing behavior that entails a costly transfer of a valued resource; Fehr, Bernhard, & Rockenbach, 2008). Specifically, we examined developmental change in the effect of recipients' moral deservingness and need on 4- and 8-year-olds' sharing in the dictator game. Though some previous research has assessed the impact of recipient characteristics on young children's resource allocations (Baumard, Mascaro, & Chevallier, 2012; Brownell, Svetlova, & Nichols, 2009; Moore, 2009), few, if any, studies have tested developmental differences in how these recipient characteristics influence the costly sharing behavior of preschool- and school-age children. Additionally, previous studies have compared a limited set of recipient characteristics (usually one or two characteristics), whereas the current study compared children's sharing in five different recipient conditions. More specifically,

participants were given the opportunity to share with morally deserving recipients (i.e., those who share or do not push others), morally undeserving recipients (i.e., those who do not share or push others), needy recipients (i.e., those who do not have toys or are sad), not needy recipients (i.e., those who have lots of toys or are happy), as well as a neutral recipient who was not described with any specific attributes beyond being of the same age and gender as the participant.

### **The Development of Children's Sharing**

Early research and theory on the development of distributive justice (e.g., Damon, 1975, 1977; Enright et al., 1984) explored the competing pressures between others' need and the maximization of self-gain in children's reasoning about resource allocation and suggested that there is a distinct developmental sequence to children's conceptions of fairness in resource distributions. According to this theoretical perspective, the norms used to evaluate fairness in resource distribution shift with development from self-interest and salient physical characteristics (e.g., age, gender, size) in preschool-aged children, to the consideration of equality by age 5, the consideration of merit by age 6 to 7, and towards the more complex consideration of norms such as equity and need by age 8 (for reviews, see Gummerum, Hanoch, & Keller, 2008; Huntsman, 1984). Although this perspective has been supported by some empirical studies (e.g., Fehr et al., 2008), other findings do not support such a strictly developmental sequence in children's resource allocations and reasoning about distributive justice, but instead suggest that children apply fairness norms based on situational cues, a trend that increases in late childhood (e.g., McGillicuddy-De Lisi, Watkins, & Vichur, 1994; Sigelman & Waitzman, 1991).

The dictator game (Kahneman, Knetsch, & Thaler, 1986) has been used widely in studies of costly sharing (see, for example, Gummerum, Hanoch, Keller, Parsons, & Hummel, 2010;

Ongley & Malti, 2014). In the simplest two-person, one-shot version of the dictator game, the sharer is given a sum of money or other valuable resource that she or he can—but does not have to—share with an anonymous recipient. The recipient does not have the option of rejecting any offer made by the proposer, nor can the recipient reciprocate or punish the proposer's action. Keeping the money and being selfish has no negative consequences for the proposer, and sharing has no (evident) social gains. Proposers who maximize self-interest should not give anything to the recipient. Yet, empirical research with adults has shown that individual proposers give on average 20 to 30% of the initial resources, with modal offers typically being at 0 or 50% (Camerer, 2003). At 6 to 8 years of age, the majority of children share equally with friends, acquaintances, and anonymous others in dictator games or forced-choice tasks with predefined allocation options, whereas 3- to 4-year-olds are more likely to favor themselves (Blake & Rand, 2010; Fehr et al., 2008; Gummerum et al., 2010). Similarly, 6- to 8-year-olds, but not younger children, prefer to share equally with unfamiliar or anonymous peers even when this means rejecting a larger reward for themselves (Blake & McAuliffe, 2011; Shaw & Olson, 2012). These findings indicate that from early elementary school onwards, children demonstrate a strong aversion to inequality, even to the extent that they will sacrifice resources if they themselves get more than others.

### **Recipient Characteristics and Children's Sharing**

For our examination of recipient characteristics and their influence on preschool- and school-aged children's sharing, we focused on the dimensions of moral deservingness and need. We presented children with recipients who demonstrated moral deservingness by sharing with peers and by not pushing others. Recipients' moral undeservingness, on the other hand, was exemplified by pushing others and the failure to share. These examples of moral rule abidance

and transgression were chosen because of their demonstrated salience in young children's judgments about morality (see for example, Malti & Krettenauer, 2013). To exemplify need and the lack of need, we presented participants with recipients who were emotionally needy (i.e., sad) or not emotionally needy (i.e., happy) and recipients who were materially needy (i.e., having few toys) or not materially needy (e.g., having many toys). These dimensions of need (i.e., emotional and material) were chosen because they have been used extensively in previous research to measure prosocial responding (e.g., sharing) in children (Chernyak & Kushnir, 2013; Dlugokinski & Firestone, 1973; Eisenberg, Spinrad, & Morris, 2014; Rushton & Wheelwright, 1980).

Recent studies using non-costly and third-party resource allocation contexts (i.e., distribution tasks in which participants are asked to allocate resources between hypothetical story characters or puppets, but cannot assign any resources to themselves) have shown that the consideration of moral deservingness (Baumard et al., 2012; Kenward & Dahl, 2011; Olson & Spelke, 2008), emotional need (Davidov, Zahn-Waxler, Roth-Hanania, & Knafo, 2013; Zahn-Waxler, Radke-Yarrow, Wagner, & Chapman, 1992), and material need (Brownell et al., 2009; Kienbaum & Wilkening, 2009) begin to influence young children's resource allocations as early as the preschool years. Although this body of work contributes substantially to our understanding of the ways in which recipient characteristics influence noncostly sharing, the ways in which the recipient characteristics of moral deservingness and emotional and material need influence *costly* sharing remain largely unexplored.

Existing work on recipient merit and reciprocity suggests that, by age 3, children do factor certain social contextual cues into their costly sharing allocations. For example, preschool-aged children have been found to increase their sharing offers when given the opportunity to

directly reciprocate a recipient's past sharing or cooperation (House, Henrich, Sarnecka, & Silk, 2013; Levitt, Weber, Clark, & McDonnell, 1985; Warneken & Tomasello, 2013) and when recipients contributed substantial effort to a joint goal (Hamann, Warneken, Greenberg, & Tomasello, 2011; Kanngiesser & Warneken, 2012; Warneken, Lohse, Melis, & Tomasello, 2011). To the best of our knowledge, however, existing work has not examined the ways in which the recipient characteristics of moral deservingness and need affect children's sharing allocations when the opportunity for self-gain is also at play (i.e., in costly sharing contexts). Existing work by Chernyak and Kushnir (2013) examines costly sharing in preschool-aged children and does suggest that 3- and 4-year olds are motivated to share with an emotionally needy recipient (in this case, a puppet), particularly when they have chosen to make a costly sharing allocation in the past. The emotionally needy recipient was held constant across conditions in this study, however, as recipient characteristics were not the key variable of interest, and the question of what effect recipient neediness has on children's sharing remains unanswered.

These gaps in the existing research, along with recent findings that conflict with early work on children's reasoning about resource allocation, suggest that new work is needed to refine our understanding of children's conceptions of distributive justice and the extent to which recipient characteristics influence children's costly sharing distributions at different stages in development.

### **The Current Study**

Based on findings from previous studies using the dictator game with preschool- and school-aged children (e.g., Blake & McAuliffe, 2011; Gummerum et al., 2010; Shaw & Olson, 2012; Takezawa, Gummerum, & Keller, 2006), we hypothesized that 8-year-olds would share

equally with a neutral recipient but that 4-year-olds would share less than half and significantly less than 8-year-olds. We also predicted that children of both age groups would adapt their sharing decisions depending on recipient characteristics. This hypothesis is necessarily speculative, but is drawn from previous findings suggesting that sharing increases when recipients are described with certain positive attributes, such as being a friend or peer, or as somebody who has put more effort into a joint goal than the sharer (Kanngiesser & Warneken, 2012; Moore, 2009; Warneken et al., 2011).

We also hypothesized that there would be developmental differences in the effect of recipient characteristics on children's sharing, and that the differentiation of sharing behavior based on recipient characteristics would be stronger for 8-year-olds than for 4-year-olds. More specifically, when presented with a recipient displaying moral deservingness and need, 8-year-olds were expected to share more than half of their stickers, whereas when they were presented with moral undeservingness or the lack of need, 8-year-olds were expected to share less than half. For 4-year-olds, in contrast, the characterization of recipients as morally deserving or needy is expected to lead to equal sharing (i.e., an upward shift from the self-favouring allocations demonstrated in sharing tasks with neutral recipients. The provision of information about recipients' moral undeservingness and lack of need to 4-year-olds, however, was not expected to lead to different sharing allocations than those present in the neutral condition. Our hypotheses regarding age-related changes on the effect of recipient characteristics on children's sharing resonates with earlier research in the distributive justice tradition: Although equality still dominates in the distribution choices and reasoning of elementary school-age children, they are more likely than younger children to adapt their allocation decisions to characteristics of the recipient and more strongly differentiate between different types of recipients (Huntsman, 1984;

McGillicuddy-De Lisi, et al., 1994; Sigelman & Waitzman, 1991). Research in the distributive justice tradition, in addition, has demonstrated that 4-year-old children consider merit and need in their hypothetical allocation choices, but that the use of these distribution principles increases steadily in children's reasoning about distribution until the late elementary school years (Huntsman, 1984).

## Method

### Participants

The participants in the current study were a community sample of 160 children from a suburban area of a major Canadian city. Participants were 78 4-year-olds ( $M_{\text{age}} = 4.44$  years,  $SD = .27$ ; 38 girls [49%]) and 82 8-year-olds ( $M_{\text{age}} = 8.49$ ,  $SD = .24$ ; 43 girls [52%]). Participating children were fluent in English. As a measure of socioeconomic status, we asked primary caregivers to report their highest level of education (Hoff, Laursen, & Bridges, 2012). Fifty-four percent of primary caregivers reported that they had completed a university degree, followed in frequency by the completion of a college degree (22%), graduate degree (14%), and high school (8%). Two percent of the primary caregivers chose not to report their level of education. We compared the frequencies of the level of education of the caregivers in our sample to the frequencies reported in the 2006 Census (Statistics Canada, 2007). According to the 2006 Census (Statistics Canada, 2007), the level of education of the caregivers in our study is representative of the general education level in the city from which our sample was drawn.

The participants in the current study were composed of an ethnically diverse sample. Ethnic backgrounds reported by primary caregivers include Western European (33%), South Asian (14%), Eastern European (11%), East Asian (4%), Caribbean (3%), West and Central Asian (3%), Southeast Asian (3%), African (3%), Central and South American (3%), and

other/multiple origins (17%). Six percent of the primary caregivers chose not to report their ethnic background.

### **Procedure**

Children and their primary caregivers visited the research laboratory once. Primary caregivers provided written informed consent for their child's participation at the onset of the session and children provided informed verbal consent. Children were interviewed in a separate room while primary caregivers completed a demographic questionnaire. Each session lasted approximately 45 minutes and consisted of a paper-and-pencil interview, an interactive game (e.g., the dictator game), and video recording for transcription purposes. The testers were undergraduate psychology students who had been extensively trained in the relevant interview and observation techniques.

### **Measures**

**Sharing.** Children's sharing behavior was measured using the dictator game (Kahneman et al., 1986). In line with existing research, children first participated in the standard, single-item dictator game (e.g., neutral condition). Four and 8-year-olds received 6 stickers and were then given the opportunity to share (or not share) any number of these stickers with an anonymous hypothetical child of the same age and gender (Benenson, Pascoe, & Radmore, 2007; Gummerum et al., 2010), who was seen in a picture shown by the experimenter. Stickers were chosen because previous research has shown stickers are highly valued by children in both early and middle childhood (see Benenson et al., 2007). Furthermore, studies have examined children in both early and middle childhood and found no significant age differences in the reported attractiveness of stickers (see Ongley & Malti, 2014). The instruction read by the experimenter was as follows:

We're going to play a choosing game. In this game you can keep stickers for yourself, or you may choose to give some stickers to other children. This girl/boy is 4/8 years old, just like you (the experimenter shows the picture of the neutral child). This is her/his box, and this is your box. If you would like to give her/him any stickers, you can put them in her/his box. Put your stickers in your box. Ok, you can now choose if you'd like to give some stickers to her/him, or not.

Children then put the stickers they chose to share into a box provided by the experimenter. In order to minimize socially desirable choices, the experimenter was trained to explicitly look away during children's sharing. Children were informed that they would not be returned the stickers they shared, but were allowed to keep the stickers they did not share. After having participated in the neutral condition (standard, single-item dictator game), children were presented with 8 other pictures, which represented additional variations of the standard dictator game that systematically manipulated specific characteristics of the hypothetical recipient. In line with previous studies on the dictator game (e.g., Gummerum et al., 2010), children were shown gender- and age-matched pictures illustrating the key recipient characteristics. Each of the 8 additional variation pictures shown to children depicted one specific hypothetical recipient characteristic (see Table 1 for the text for each characteristic). These initial 8 additional variation pictures were then collapsed into 4 conditions based on the recipient characteristics. Each of the 4 obtained conditions was composed of 2 recipient characteristics. Each condition included two different trials, in which each of the trials had a different recipient characteristic. The 4 conditions were: (a) Morally deserving recipients (i.e., a child who shares with other children

and a child who does not push other children; Cronbach's  $\alpha = .68$ ), (b) morally undeserving recipients (a child who does not share with other children and a child who pushes other children; Cronbach's  $\alpha = .75$ ), (c) needy recipients (a child who has few toys and a child who is sad; Cronbach's  $\alpha = .73$ ), (d) not needy recipients (a child who has lots of toys and a child who is happy; Cronbach's  $\alpha = .73$ ). Therefore, 5 dictator game conditions were utilized in analyses: The neutral, single-item recipient condition and the 4 two-item conditions based on the recipient characteristics.

Children were given 6 stickers with each variation picture just like in the first, neutral condition. The experimenter then emphasized to the participant that they could share as many stickers as they liked, but that they did not have to share any if they didn't want to. For example:

Now let's take a look at another girl/boy (a picture is shown in which a child does not share cookies with another child). She/he does not share her/his cookies with other children (i.e., one characteristic of the morally undeserving recipient condition). Ok, you can now choose if you'd like to give some stickers to her/him, or not.

We conducted a pilot study ( $N = 12$ ) to ensure all questions and tasks were age-appropriate (see Figure 1 for an example of a not needy recipient category). Results showed that all children, including nine children in the younger age group (i.e., 4-year-olds), fully understood all the pictures of different recipient characteristics (i.e., in one picture of the needy condition, they accurately described that the character only has a few toys).

To control for order effects, we used an incomplete counterbalancing design technique called Latin square, which is commonly used for studies with multiple conditions. The formula

for Latin square randomization order was 1, 2N, 3N-1, 4N-2, and 5N-3, where N = total number of conditions. We did not find any order effects in our results.

Consistent with previous research (Gummerum et al., 2010), a proportional sharing score was calculated in which the number of items each participant shared was divided by the total number of stickers they received from the experimenter. We also investigated different patterns of sharing across age groups and recipient characteristics (Gummerum et al., 2010) by examining the percentages of participants who (a) did not share, (b) shared less than half, or (c) shared more than half of their stickers with recipients with different characteristics.

## Results

Analysis of differences in sharing behavior across age groups are presented in two steps: First, we used mean proportional scores of shared stickers to compare mean differences among recipient characteristics, and then we created nominal values to compare frequencies for four different sharing patterns (children who did not share, who shared less than half, who shared half, and who shared more than half of their stickers).

### **Effects of Recipient Characteristics on the Development of Children's Sharing Mean Scores**

To test for sharing differences as a function of age and recipient characteristics, a 2-way repeated measures 2 x 5 (Age group x Recipient category) ANOVA was conducted with age group as the between subjects factor and recipient characteristic as the within-subjects factor. Mauchly's test indicated that the assumption of sphericity was violated for recipient characteristic,  $\chi^2(9) = 24.96, p < .05$ ; therefore the degrees of freedom were corrected using the Greenhouse-Geisser estimate of sphericity ( $\epsilon = .96, df = 3.7$ ). There was a significant main effect of recipient characteristic,  $F(3.7, 632) = 90.64, p < .001, \eta^2 = .35$ , and a significant main effect of

age,  $F(1,158) = 5.07, p < .05, \eta^2 = .032$ . Both effects were qualified by a significant interaction between age group and recipient characteristic,  $F(4,632) = 44.4, p < .001, \eta^2 = .032$ . To further explore the two-way interactions, independent sample t-tests were used to compare age differences within recipient characteristics; paired sample t-test with Bonferroni adjustments were used to compare differences among recipient characteristics for each age group. The Bonferroni correction is known as the most conservative method to control for type I error when making multiple comparisons (Shaffer, 1995). Accordingly, the adjusted  $\alpha$  value to reject a possible set of unknown true null hypothesis was divided by the total number of comparisons made (i.e., 10 comparisons were performed and the adjusted  $\alpha$  value was  $\alpha = .005$ ). Table 2 displays the means and standard deviations for recipient characteristics by age group. Letter subscripts indicate significant differences among recipient characteristics.

**Effects of recipient characteristics on sharing across age group.** Across age groups, participants shared the most with morally deserving and needy recipients, followed by not needy and neutral recipients. Children shared the least with morally undeserving recipients. Compared to 4-year-olds, 8-year-olds shared significantly more with needy, morally deserving, and neutral recipients. In contrast, 4-year-olds shared significantly more with morally undeserving recipients than 8-year-olds. Four- and 8-year-olds did not differ in sharing with not needy recipients (all significant differences  $p < .001$ ; and Figure 2).

**Effects of recipient characteristics on sharing within age group.** Results from post-hoc t-tests with Bonferroni corrections revealed that consistent with predictions, four-year-olds shared significantly fewer stickers in the morally undeserving condition than in the morally deserving condition, and than in the needy condition. Similarly, they also shared fewer stickers in the neutral condition than in the morally deserving condition and needy condition.

Sharing did not differ among morally undeserving recipients, neutral recipients and not needy recipients. In contrast, 8-year-olds showed a greater degree of differentiation in their sharing behavior with significant differences in sharing occurring between all recipient characteristics, except for neutral and not needy conditions, which did not differ between each other. Eight year-olds shared more stickers in the needy condition than in the morally deserving condition, than in both the neutral and not needy conditions, and than in the morally undeserving condition. Similarly, 8 year-olds shared more stickers in the morally deserving condition than both the neutral the not needy conditions, and than in the morally undeserving condition. They also shared more stickers in the neutral condition than in the morally undeserving condition, as well as more in the not needy condition than in the morally undeserving condition (See letter subscripts in Table 2).

### **Analysis of Sharing Patterns**

In line with previous research, we also analyzed different patterns of sharing across age groups and recipient characteristics (Gummerum et al., 2010). We decide to explore sharing patterns in addition to mean score differences, as these patterns allow us to test differences in specific sharing behaviors (e.g., sharing nothing versus sharing less than half). Table 3 displays the frequencies and percentages of participants (overall and within each age group) who did not share, shared less than half, shared half, and shared more than half of their stickers with recipients in each condition.  $\chi^2$  tests were used to assess whether sharing pattern frequencies differed as a function of age group, and cellwise residual analyses (Beasley & Schumacker, 1995) were used post-hoc to compare specific age differences among sharing pattern frequencies. Letter subscripts in Table 3 indicate sharing patterns that differed between 4- and 8-year-olds.

**Developmental differences in recipient characteristics effects on sharing patterns.** The majority of 8-year-olds shared more than half of their stickers with both morally deserving and needy recipients (57% and 73% of participants, respectively). This was not the case for 4-year-olds, however, of which only 32% and 28% shared more than half with morally deserving and needy recipients, respectively. With the exception of the morally undeserving recipient condition, a significantly higher percentage of 4-year-olds compared to 8-year-olds chose not to share any stickers for all other conditions. Interestingly, 24% of 4-year-olds shared more than half with morally undeserving recipients and 30% with not needy recipients, compared to only 1% and 12% of 8-year-olds, respectively.

### **Discussion**

The current study investigated the ways in which specific recipient characteristics affect 4- and 8-year-old children's costly sharing in the dictator game. With this research, we sought to contribute to the refinement of theories of distributive justice in childhood by examining the ways in which recipient characteristics such as moral deservingness and need predict resource allocations in preschool and school-aged children. Early research and theory on the development of distributive justice (e.g., Damon, 1975, 1977; Enright et al., 1984) have suggested that there is a distinct developmental sequence in children's resource allocations and in their reasoning about fairness in resource distributions. However, empirical findings have not consistently supported such a strictly developmental sequence in children's resource allocations and reasoning about distributive justice, but instead suggested that children apply fairness norms based on situational cues, though this increases in late childhood (e.g., Huntsman, 1984; McGillicuddy-De Lisi et al., 1994; Sigelman & Waitzman, 1991). The current study contributed to this body of work by

examining age related change in children's use of moral deservingness and need as cues for the division of resources between themselves and a hypothetical peer.

In line with our expectations, and with existing research examining developmental trends in costly sharing, the majority of 8-year-olds shared exactly half and, on average, 47% of their stickers with a neutral peer (i.e., when no information about the intended recipient was provided). In contrast, 4-year-olds in the same condition exhibited lower levels of sharing, with one third (33%) being the average proportion of stickers shared. Also, one third of the 4-year-olds (35%) did not share at all in the neutral condition, whereas only 4% of the 8-year-olds chose to share nothing in the neutral condition. These findings, viewed within the emerging body of research examining developmental change in sharing, indicate a strong, and perhaps universal, trend towards an increased inequality aversion and the prioritization of equality and others' interests by middle childhood (Blake & McAuliffe, 2011; Fehr et al., 2008; Ongley & Malti, 2014; Shaw & Olson, 2012). The preference for equality demonstrated in 8-year-olds' sharing in the neutral condition could be interpreted as reflecting a balance between conflicting motivations to maximize self-gain and to take the best interests of others into account (Malti, Gummerum, Keller, Chaparro, & Buchmann, 2012; Malti & Ongley, 2014). The more selfish allocations of 4-year-olds, however, may indicate a greater prioritization of self-gain and less consideration of others' wants or needs.

An important finding was that children as young as 4 years of age use information about recipients' characteristics to make decisions about the allocation of resources in costly contexts. Both 4- and 8-year-old children shared more with morally deserving and needy recipients than with neutral recipients. These findings support and extend previous work on children's use of

social contextual cues in third-party distributions tasks. For example, Kenward and Dahl (2011) found, in a related study, that 4.5-year-olds gave more wooden biscuits to a puppet who had been previously helpful than one who had been previously violent and unhelpful. Our findings suggest that children as young as 4 years of age not only reward past morally upstanding behavior in others in their sharing distributions but do so even when it is costly to themselves.

The results of our study also indicated that knowledge about the recipient's moral (un)deservingness and need affects the costly sharing of 4- and 8-year-old children differently. For 8-year-old children, we expected that recipients who were morally deserving and needy would receive higher sharing allocations than neutral recipients. Recipients' moral undeservingness and lack of need, however, were expected to decrease sharing allocations in comparison to neutral recipients. With one exception, the current findings support our hypotheses. On average, 8-year-old children gave significantly more than half to recipients who previously demonstrated moral deservingness (i.e., by sharing with and not pushing others) and need (i.e., by displaying sadness and having few toys). They gave significantly less than half to recipients who were morally undeserving and slightly less than half to those who were not materially or psychologically needy. These findings suggest that the baseline preference for equality in the sharing allocations of 8-year-olds acts as an anchor, or a basic rule, for sharing decisions and is used primarily when children are provided with minimal information about the recipient of their shared resources or the social context of the sharing decision (Messick, 1993). In other words, in line with previous findings (Kienbaum & Wilkening, 2009), the fairness norm of equality is used in the resource allocations of 8-year-olds only when more complex social contextual cues (such as moral deservingness and need) are not relevant, as is the case in the neutral condition of the dictator game. When relevant social contextual information (i.e.,

recipient characteristics) is provided, however, 8-year-olds' sharing allocations often deviate widely from this anchoring point, and equality ceases to be the dominant norm. Moreover, the developmental differences in the effect of recipient characteristics on children's sharing could be related to 4-year-olds' cognitive limitations, and may result in their lack of proper consideration of recipient characteristics while sharing.

The one exception to the current findings demonstrating that 8-year-olds vary their resource allocations widely based on the recipient characteristics of moral deservingness and need is that the mean proportion of stickers shared with recipients who were not needy did not differ significantly from the mean proportion allocated to neutral recipients. This would suggest that, unlike past moral transgressions, the lack of psychological or material need is not sufficient for 8-year-olds to deviate from equal sharing distributions and retain a higher proportion of stickers for themselves. The frequency of 8-year-olds' use of specific sharing patterns, however, suggests that many 8-year-olds do indeed take lack of need into account when making resource allocation decisions. Fifty-eight percent of 8-year-olds shared less than half or none of their stickers with not needy recipients, whereas only 27% shared less than half or none of their stickers with neutral recipients. This suggests that many 8-year-olds do choose to consider their own interests when faced with a happy or "wealthy" recipient.

In line with our expectations, our findings revealed age-related differences in the effect of recipient characteristics on the sharing allocations of 4- and 8-year-olds. Based on previous research (e.g., Leahy, 1979; Moore, 2009; Warneken et al., 2011), we expected that 4-year-olds would share equally (i.e. share approximately half of their stickers) only with recipients who were morally deserving and in need. Four-year-olds were expected to share less than half of their stickers with neutral recipients and those who were presented as morally undeserving and not

needy. Our findings indicate that 4-year-olds do indeed share less than half with neutral recipients and significantly increase their allocations when presented with information about the recipient's moral deservingness and need. For example, as with 8-year-olds, the mean proportion of stickers that 4-year-olds shared with morally deserving and needy recipients was significantly higher than the proportion shared with neutral recipients. Previous research has found that even young children consider reciprocity when navigating social exchanges (Levitt et al., 1985; Olson & Spelke, 2008), suggesting that both 4- and 8-year-olds may reward the previous prosociality of morally deserving recipients by reciprocating with elevated prosocial sharing of their own. Participants' increased sharing with morally deserving recipients is also consistent with early developmental accounts that highlight the central role that reciprocity plays in moral development (e.g., Piaget, 1932).

In addition, considering our findings in light of previous studies (Malti et al., 2012; Ongley & Malti, 2014), we can speculate that the presentation of others' emotional and material needs may arouse sympathy which in turn increases prosocial responding, or sharing, in 4- as well as 8-year-olds. Being presented as not needy did not lead 4-year-olds to a reduction in sharing allocations. Previous research on children's prosocial reactions to emotion displays has found similar results. For example, Denham (1986) showed that 2- and 3-year-old children already respond with increased prosocial reactions to happy emotional displays of peers during free play. Thus, it may be that when presented with a happy peer, children act prosocially to reinforce or maintain the peer's happy emotion. Relatedly, children in our study may have shared with a happy recipient not because they perceived him or her to lack need, but because they wanted to keep the recipient happy.

Interestingly, the only condition in which 4-year-olds allocated higher mean proportions of stickers to others than 8-year-olds was the condition in which recipients were described as morally undeserving. In addition, 4-year-olds shared more than half of their stickers with morally undeserving recipients with comparatively greater frequency. Twenty-four percent of 4-year-olds shared more than half of their stickers with morally undeserving recipients, whereas the frequency of 8-year-olds sharing more than half in the same condition was only 1%. Though it is necessarily speculative, as participants did not provide rationales for their sharing allocations and could not interact with the (hypothetical) recipients, it is possible that the relatively high number of 4-year-olds who shared more than half with morally undeserving peers, were motivated by fear. Previous research has found positive associations between fear and prosocial behavior (e.g., Malti, Gasser, Gutzwiller-Helfenfinger, 2010) and it may be the case that the fear of retribution from bullies, or those who otherwise hurt their peers, is a salient enough emotion to motivate high levels of sharing even when directed towards hypothetical peers. However, another explanation for younger children's allocations to not needy and morally undeserving peers is that some of them may have been less cognitively advanced (e.g., they could have been less advanced theory of mind abilities and could have been in the lower stages of moral reasoning), which subsequently reduced their capability to take into account need in their sharing behavior.

Overall, the current study documented that recipient characteristics differentially affect the costly sharing of preschool- and elementary school-age children. Though it is interesting to uncover the earliest ages at which children integrate certain types of information in their sharing decisions, it is equally important to investigate developmental differences in the relationship between recipient characteristics and sharing in younger and older children and adolescents. With development, children may increasingly coordinate and integrate situational cues and the

other child's perspective with their empathic tendencies towards the recipient which, in turn, may influence their actual sharing decisions. This argument is supported by research on children's interpretive understanding, which involves the coordination of one's own with more than one "other" perspective (i.e., second order theory of mind), and has shown that interpretive understanding strongly develops between the ages of 4 and 8 (Lalonde & Chandler, 2002). Assessing which developing cognitive and socio-cognitive abilities underlie children's costly sharing continues to be a fruitful avenue for future research.

Although this study provided novel information regarding the effect of recipient characteristics on children's sharing in early versus middle childhood, it is important to consider possible limitations. One limitation is that the recipients were anonymous, hypothetical children, and the extent to which these findings can be generalized to sharing in real-life is somewhat limited. However, sharing resources with anonymous hypothetical others in the dictator game incurs real tangible costs for the child, which is why it is considered to be high-cost behavior with real-life implications (Fehr et al., 2008). In addition, although our sample was representative of the community from which it was drawn, the families represented mostly mid-to high SES backgrounds. Since previous research has identified differences in sharing by SES (Benenson et al., 2007), a replication of our study with children from different socio-economic backgrounds is warranted. Furthermore, because in the current study the experimenter was present when children's allocations occurred, we cannot be entirely certain that children's allocations were independent of social desirability. However, the experimenter was extensively trained to look away while children shared the stickers in order to reduce social desirability as much as possible.

Another important limitation is that in the current study we did not ask participants for any rationale regarding their sharing allocations. The decision not to evaluate moral reasoning was made for several reasons. First, in our previous studies, a very small proportion of 4-year-olds were able to provide elaborated reasoning for their moral behavior. For example, even when younger children understood that the transgression of a moral rule is wrong, they were unable to explain why. This suggests that it is difficult for younger children to provide sophisticated moral reasoning (Malti & Keller, 2010). Thus, based on previous related studies that have shown younger children's cognitive limitations (e.g., Wellman, Cross, & Watson, 2001), we did not examine children's reasoning. Second, in order to assess children's spontaneous sharing and to minimize social desirability, the experimenter was trained to look away during children's allocations. Thus it was not possible to ask children for an explanation of their allocations. However, many of the proposed explanations for children's sharing allocations are necessary speculative and worthy of further study. For example, in line with Sigelman's (2013) findings, our findings suggested children's negative affect (i.e., empathy) attributed toward poorer (i.e., needy) individuals might have led to their sharing more with such individuals. Thus decoupling need from emotions would be of interest for future research. Another limitation is that, though previous studies (e.g., Smetana, 1981) have shown differences in preschoolers' consideration of different recipient characteristics (e.g., unfairness and physical harm), such characteristics were collapsed for analyses in our study because we found no significant differences between them. Future studies should disentangle these characteristics and examine their specific role in children's allocations. Lastly, because of the cross-sectional design of the current study, no claims can be made about causal relations. Future longitudinal studies are warranted to elucidate intra-individual differences in children's sharing decisions.

Despite these limitations, the current study provides new information on social contextual variations (i.e., recipient characteristics) that influence 4- and 8-year-old children's sharing. In sum, our results demonstrated that school-aged children are more likely than preschoolers to prioritize others' interests in low information sharing contexts (e.g., the neutral condition) and to make changes to these sharing decisions in a greater range of contexts (i.e., when information regarding recipients' moral deservingness and need; see Sigelman, & Waitzman, 1991). However, contrary to early theories regarding young children's reasoning about distributive justice that propose preschoolers rely upon salient physical characteristics and engage in self-serving distributions in decision-making regarding resource allocations, 4-year-olds did increase their sharing when presented with morally deserving and needy recipients, suggesting that certain recipient characteristics are salient even for young children in costly sharing tasks. Taken together, these findings show that changing the framing of the dictator game by providing information about recipients' need and their past (im)moral actions can have significant effects on both 4- and 8-year-olds' altruistic sharing. Although the differentiation of sharing behavior based on recipient characteristics begins to emerge in early childhood, our findings indicate that children's level of differentiation in their sharing decisions increases substantially by middle childhood.

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Table 1

*Instructions for Each Recipient Characteristic in Each Condition of the Dictator Game*

Condition	Characteristic	Instruction
Neutral	No characteristic	“This girl/boy is 4/8 years old, just like you.”
Morally deserving	Shares with others	“She/he shares her/his cookies with other children.”
	Does not push	“She/he does not push other children.”
Morally undeserving	Does not share	“She/he does not share her/his cookies with other children.”
	Pushes others	“She/he pushes other children.”
Needy	Has no toys	“She/he has no toys.”
	Is sad	“She/he is sad.”
Not needy	Has lots of toys	“She/he has lots of toys.”
	Is happy	“She/he is happy.”

*Notes.* N = 160 (78 4-year-olds, 82 8-year-olds).

Table 2

*Means and Standard Deviations of Proportional Sharing Scores by Recipient Category and Age*

*Group*

Recipient condition	4 year-olds	95% CI	8 year-olds	95% CI
Neutral	0.33(0.30) <sub>b</sub>	[.27, .38]	0.47(0.20) <sub>c</sub>	[.42, .53]
Morally Deserving	0.45(0.30) <sub>a</sub>	[.39, .51]	0.62(0.19) <sub>b</sub>	[.58, .69]
Morally Undeserving	0.35(0.33) <sub>b</sub>	[.29, .41]	0.16(0.19) <sub>d</sub>	[.08, .20]
Needy	0.45(0.31) <sub>a</sub>	[.40, .51]	0.70(0.21) <sub>a</sub>	[.65, .77]
Not Needy	0.41(0.33) <sub>ab</sub>	[.36, .48]	0.41(0.20) <sub>c</sub>	[.35, .47]

*Notes.* (i)  $N = 160$  (78 4-year-olds, 82 8-year-olds). CI = confidence intervals. <sup>abcd</sup>For each age group, means with different subscripts differ significantly ( $ps < .05$ ) across recipient conditions. (ii) Proportional scores are derived by dividing the total number of shared stickers by 6 (total number of stickers given), and scores for all conditions (except for the neutral condition) are the average of the proportional scores of the two characteristics within each condition. Possible scores for all means range from 0 to 1. For all conditions, higher scores indicate more stickers shared.

Table 3

*Sharing Pattern Frequencies (%) by Recipient Condition and Age Group*

		4-year-olds (n = 78)	8-year-olds (n = 82)	$\chi^2$
Neutral	Did not share	28(35.4) <sub>a</sub>	3(3.6)	26.77 <sup>***</sup>
	Shared less than half	11(13.9)	20(23.8)	
	Shared half	32(40.5)	47(56) <sub>a</sub>	
	Shared more than half	8(10.1)	14(16.7)	
Morally Deserving	Did not share	15(19.0) <sub>a</sub>	0(0)	30.76 <sup>***</sup>
	Shared less than half	24(30.4) <sub>a</sub>	11(13.1)	
	Shared half	15(19)	25(29.8)	
	Shared more than half	25(31.6)	48(57.1) <sub>a</sub>	
Morally Undeserving	Did not share	27(34.2)	37(44.0)	29.96 <sup>***</sup>
	Shared less than half	20(25.3)	39(46.4) <sub>a</sub>	
	Shared half	13(16.5)	7(8.3)	
	Shared more than half	19(24.1) <sub>a</sub>	1(1.2)	
Needy	Did not share	14(17.7) <sub>a</sub>	0(0)	44.07 <sup>***</sup>
	Shared less than half	25(31.6) <sub>a</sub>	8(9.5)	
	Shared half	18(22.8)	15(17.9)	
	Shared more than half	22(27.8)	61(72.6) <sub>a</sub>	
Not Needy	Did not share	22(27.8) <sub>a</sub>	4(4.8)	35.13 <sup>***</sup>
	Shared less than half	15(19)	44(53.0) <sub>a</sub>	
	Shared half	18(22.8)	25(30.1)	
	Shared more than half	24(30.4) <sub>a</sub>	10(12)	

*Notes.* (i) Scoring of dummy variables is as follows: 4-year-olds = 0, 8-year-olds = 1. (ii) <sup>a</sup>Subscripts indicate significant differences between 4-year-olds ( $n = 78$ ) and 8-year-olds ( $n = 82$ ) across sharing patterns ( $ps < .05$ ). Cellwise residual post-hoc analyses were used.

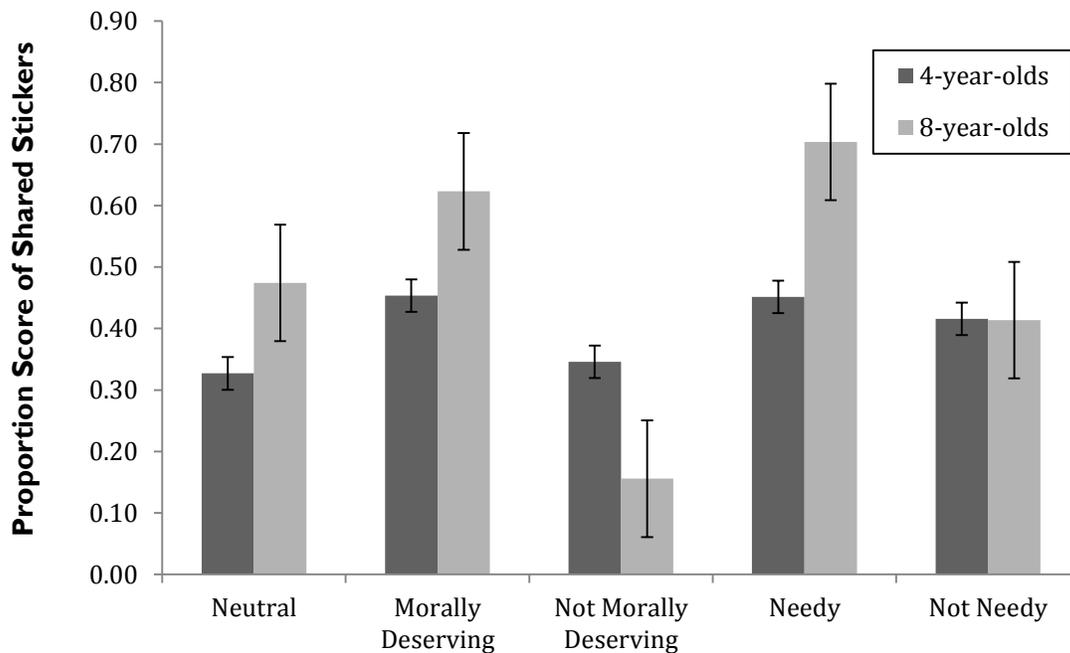
<sup>\*\*\*</sup> $p < .001$ .

## Figure Captions.



*Figure 1.* A picture depicting a not needy (i.e., happy) child.

*Notes.* The experimenter showed the above picture and a box, and read the participating child following instructions: “Now let’s take a look at another boy. He is happy. Ok, you can now choose if you’d like to give some stickers to him, or not.” A total of 9 pictures were shown and children were given 6 stickers for each picture. This characteristic was later collapsed with the “child with lots of toys” characteristic to create the “not needy” condition.



*Figure 2.* Mean of proportional sharing score by age group and recipient condition.

*Notes.* (i) Children ( $N = 160$ ) were given 6 stickers for each characteristic (54 in total). (ii) Proportional scores are derived by dividing the total number of shared stickers by 6 (total number of stickers given), and scores for all conditions (except for the neutral condition) are the average of the proportional scores of the two characteristics within each condition. Possible scores for all conditions range from 0 to 1. For all conditions, higher scores indicate more stickers shared. (iii) For all conditions, age comparisons were significantly different at  $p < .001$ .