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The Role of Moral Emotions in the Development of Children's Sharing Behavior

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The authors would like to express their sincere thanks to the children and caregivers who participated in this study. The authors are also grateful to the undergraduate students in the Laboratory for Social-Emotional Development and Intervention for their many hours of data collection. This research was funded by the Social Sciences and Humanities Research Council of Canada (SSHRC).

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This is the peer-reviewed version of the following article: Ongley, S.F., & Malti, T. (2014). The role of moral emotions in the development of children's sharing behavior. *Developmental Psychology*, 50(4), 1148-1159. doi: 10.1037/a0035191, which has been published by the American Psychological Association. The publication is available in the publisher's final form at: <http://dx.doi.org/10.1037/a0035191>. This article may not exactly replicate the final version published in the APA journal. It is not the copy of record.

Abstract

This study investigated the role of moral emotions in the development of children's sharing behavior ($N = 244$ 4-, 8-, and 12-year-old children). Children's sympathy was measured with both self- and primary caregiver-reports and participants anticipated their negatively and positively valenced moral emotions (i.e., feeling guilty, sad, or bad and proud, happy, or good) following actions that either violated or upheld moral norms. Sharing was measured through children's allocation of resources in the dictator game. Children's self-reported sympathy emerged as a significant predictor of sharing in early childhood. For children with low levels of sympathy, sharing was also predicted by negatively valenced moral emotions following the failure to perform prosocial actions. In addition, results demonstrated an age-related increase in sharing for boys between the ages of 4 and 8 and a decrease in sharing for boys between the ages of 8 and 12. We discuss the findings in relation to the emergence of two compensatory emotional pathways to sharing, one via sympathy and one via negatively valenced moral emotions.

Keywords: sharing, moral emotions, sympathy, dictator game, prosocial development

The Role of Moral Emotions in the Development of Children's Sharing Behavior

The sharing of resources represents a willingness to sacrifice personal gains out of concerns for fairness, equality, and the needs of others. Along with other forms of giving, sharing is one of the key social behaviors that distinguishes humans from other species (Knafo & Plomin, 2006) and contributes to care and cooperation in social interactions (Staub, 1979). Over the past several decades much research has focused on understanding the affective antecedents of global prosocial behavior (Eisenberg, Spinrad, & Sadovsky, 2006), but many questions remain regarding the emotional antecedents of specific subtypes of prosociality.

Despite its relevance for the development of large-scale cooperation, fairness, and care (Malti, Gummerum, Keller, Chaparro, & Buchmann, 2012), sharing remains one of the less-frequently studied subtypes of prosocial behavior. This is especially surprising in light of the fact that giving behaviors in general, and resource sharing more specifically (i.e., a subtype of giving in which some portion of a set of resources is allocated to another individual), are among the few prosocial behaviors that, when conducted privately, can be considered to be altruistic (i.e., motivated by concern for others or by internalized moral values and performed without the expectation of external reward) (Carlo, 2006). Although non-altruistic prosocial behaviors, by definition, result in benefit to another individual, their motives are unspecified and may be focused on the self (e.g., the avoidance of punishment or the expectation of external rewards) (Eisenberg & Miller, 1987). In the current study, we therefore examine sharing behavior specifically as we believe that it stands as an exemplar of children's altruistic intentions.

Recent research using behavioral economic paradigms has made valuable contributions to our understanding of children's sharing, including the examination of fairness norms and their emergence in childhood (Fehr, Bernhard, & Rockenbach, 2008; Gummerum, Hanoch, Keller,

Parsons, & Hummel, 2010; Kogut, 2012), the importance of contextual features of sharing, such as resource value (Blake & Rand, 2010) and individual involvement in resource earning (Warneken, Lohse, Melis, & Tomasello, 2011), as well as effects of gender (Leman, Keller, Takezawa, & Gummerum, 2009), culture (Rochat et al., 2009), and the broader economic environment (Benenson, Pascoe, & Radmore, 2007). There are still many questions remaining, however, regarding the development and affective-moral correlates of sharing across childhood and early adolescence. We aimed to address some of these gaps in the existing research by investigating the development of sharing behavior in an ethnically diverse sample of 4-, 8-, and 12-year old children and by examining the role of moral emotions in the motivation of sharing.

Development of Sharing

Both cross-sectional and longitudinal research on prosocial behavior has generally found that prosocial tendencies, though present to some extent in infancy and toddlerhood (Moore, 2009; Svetlova, Nichols, & Brownell, 2010), increase from early childhood to early adolescence (for a review, see Eisenberg & Fabes, 1998). There are variations in this effect, however, depending on the subtype of prosocial behavior examined and the measures used. This variation in age-related findings points to the benefit of isolating specific prosocial behaviors (Carlo, Hausmann, Christiansen, & Randall, 2003; Fehr et al., 2008) and using a consistent measure across age groups (Gummerum, Keller, Takezawa, & Mata, 2008).

Recently, an upswell of interest in sharing has occurred in the field of behavioral economics. In line with the moral relevance ascribed to other-oriented behavior in psychological research, scientists studying sharing within a behavioral economics paradigm have defined it as a representation of concern for others, even at a cost to oneself (Fehr et al., 2008). Many existing developmental studies on sharing have adopted methodological approaches derived from

economic game theory (Gummerum et al., 2010), specifically the dictator game (Kahneman, Knetsch, & Thaler, 1986). The dictator game is widely considered to be a measure of altruistic (as opposed to non-altruistic) sharing, as selfless allocations of resources in the dictator game have no external benefits (Fehr et al., 2008). Inversely, there are no external consequences for selfish allocations (Gummerum et al., 2010). In the simplest one-shot version of the dictator game, a single player chooses how many (if any) of a set number of items to allocate to an anonymous other. Sharing is completed anonymously and there is no opportunity for the recipient to respond, retaliate, or form an evaluation of the (non)sharer (Gummerum et al., 2010).

Previous studies have found that the number of items shared in the dictator game increases between early and middle childhood (Blake & Rand, 2010; Kogut, 2012). For example, Benenson and colleagues (2007) examined the sharing allocations of children aged 4, 6, and 9, and found that the number of stickers shared in the dictator game was significantly higher for 9-year-olds than for 4-year-olds. In the only longitudinal study to date on children's sharing, Malti, Gummerum, and colleagues (2012) similarly found that Swiss children's sharing allocations were higher at age 9 than at age 6. Conflicting findings have emerged, however, regarding developmental differences in sharing beyond middle childhood, with no consensus on whether sharing remains stable (Almås, Cappelen, Sørensen, & Tungodden, 2010), increases (Harbaugh, Krause, & Liday, 2002), or decreases (Leman et al., 2009). Here, we therefore investigate whether age-related increases, which are evident between early and middle childhood, also extend beyond middle childhood into adolescence.

Moral Emotions and Sharing Behavior

Negatively and positively valenced moral emotions, including guilt and pride, have been defined as self-conscious or self-evaluative because they are evoked by the individual's

understanding and evaluation of the self (Eisenberg, 2000; Lagattuta & Thompson, 2007). They are considered to arise when one acts in violation of (or in accordance with) one's moral standards (Tangney, Stuewig, & Mashek, 2007). For example, intentionally causing pain to another violates the norm against causing harm and may elicit negatively valenced moral emotions (NVME) such as feeling guilty, sad, or bad. In contrast, positively valenced moral emotions (PVME), such as feeling proud, happy, or good, arise when one has acted in a manner congruent with internalized moral standards (Mascolo & Fischer, 1995). By providing emotional feedback about the moral acceptability of one's actions (Tangney et al., 2007), NVME and PVME are assumed to facilitate other-oriented, prosocial behaviors (Hoffman, 2000).

In addition to NVME (i.e., feeling guilty, sad, or bad) and PVME (i.e., feeling proud, happy, or good), the present study also focuses on the distinct moral emotional process of sympathy. Sympathy (i.e., other-oriented concern), like empathy (i.e., emotional contagion), involves the comprehension of another's affective state. Unlike empathy, however, sympathy primarily entails other-oriented concern and is not the experience of the same or a similar emotion as the other. Sympathy has been posited by theorists to be an important motive of morally relevant, prosocial behavior (Eisenberg, 2000; Malti, Gummerum, Keller, & Buchmann, 2009). Although both sympathy and NVME, such as feeling bad or guilty, are negatively valenced, sympathy is focused on others (i.e., concern over another's emotional state), whereas other NVME are focused on the self (i.e., evaluation of the self or one's behavior in reference to a moral norm). In the current discussion we will use the terms negatively valenced moral emotions (NVME) and positively valenced moral emotions (PVME) to describe the self-evaluative moral emotions of guilt and pride and their basic emotional correlates (i.e., sad, bad,

happy, good), whereas sympathy will be measured separately from other NVME as it is distinct in its orientation towards others (Malti & Ongley, 2013).

To date, few studies have used the dictator game to investigate the role of sympathy in children's sharing. Though a large body of research has examined the association between sympathy and global prosociality, theorists have argued that sympathy is differentially related to specific subtypes of prosocial behavior (Eisenberg et al, 2006). More specifically, sympathy is conceptually related to costly and altruistic forms of prosocial behavior, but not noncostly, scripted, or compliant prosocial behaviors nor those motivated by concern for social approval (Eisenberg & Miller, 1987). The degree of association between sympathy and sharing can thus not be accurately extrapolated from studies using global measures of prosocial behavior.

Our current understanding of the role of sympathy in different types of giving is largely based on studies employing donation paradigms in which children are given the opportunity to donate earned items (e.g., tokens, candy, coins) to a needy peer or group. The strength of association between children's sympathy and their donations varies widely depending on the measure of sympathy used and contextual features of the donation task (e.g., characteristics of the recipient and degree of anonymity when donating). Most studies using self-report and questionnaire measures of sympathy, however, show a positive association between sympathy and the generosity of donations (Eisenberg & Miller, 1987). Knight, Johnson, Carlo, and Eisenberg (1994), for example, found a positive relationship between 6- to 9- year-olds' sympathy and the amount of money donated to a burn unit at a local children's hospital.

Although donation paradigms are closely related to resource allocations in the dictator game (e.g., both measure costly, anonymous, and non-reciprocal forms of giving), they differ in the level of need that is explicitly ascribed to recipients. Unlike the recipients of donations, the

need of recipients in the dictator game is not made salient and this may lead to a different pattern of association between moral emotions and sharing in the dictator game than has been previously found in donation studies. In a first study on sympathy and sharing using the dictator game, Malti, Gummerum, and colleagues (2012) showed that children's sympathy with anonymous peers at ages 6 and 7 predicted subsequent sharing at ages 7 and 9, respectively.

The majority of research on the development of NVME (i.e., feeling guilty, sad, or bad) has been conducted within the happy victimizer tradition (for a review, see Arsenio, Gold, & Adams, 2006). In this research paradigm, children and adolescents are presented with hypothetical moral rule violations (e.g., stealing another child's chocolates) and are asked to anticipate the emotion that they would expect the hypothetical victimizer (or themselves in the role of the victimizer) to feel as a result of the transgression. Typically, the attribution of negatively valenced emotions to the self-as-wrongdoer is interpreted as an indication of the internalization of moral norms (Sokol, Hammond, & Berkowitz, 2010). Previous research with children and adolescents has demonstrated direct relations between attributions of NVME and various types of prosocial behavior (for a meta-analytic review, see Malti & Krettenauer, 2013). For example, Chapman, Zahn-Waxler, Cooperman, and Iannotti (1987) found a positive association between the attribution of guilt to story characters and engagement in subsequent helping behavior in a sample of elementary school children, and Olthof (2012) found that NVME predicted 10- to 13-year-olds' peer-rated prosocial behavior. However, very few studies have provided evidence for a direct relationship between NVME and sharing. In one existing study with 3- to 5-year-olds, Gummerum and colleagues (2010) found that self-attributed NVME in the happy victimizer task significantly predicted sharing in the dictator game. Whether this

relationship holds in older age groups, however, and what role, if any, is played by sympathy in the association between NVME and sharing, are questions that remain unanswered.

In contrast to the body of research on NVME and prosocial behavior, positively valenced moral emotions (PVME) have rarely been studied in moral development research thus far (for two exceptions with adolescent samples, see Krettenauer, Jia, & Mosleh, 2011, and Krettenauer & Johnston, 2011). Several researchers have highlighted the need for such investigations (Hart & Matsuba, 2007; Malti & Ongley, 2013) based on the idea that the experience of PVME in moral contexts (i.e., when including or sharing with another) is a rewarding and possibly motivating one. When acting in accordance with moral norms, feeling proud or happy makes children feel good about themselves or their specific behaviors. For example, Weller and Lagattuta (2013) found that children attributed positive emotions to characters who self-sacrificed their own desires to help needy others. It is reasonable to believe that this positive, rewarding affective experience may serve to encourage other-oriented, prosocial behaviors.

The Current Study

In the current study, we aimed to examine the development of sharing across early childhood, middle childhood, and early adolescence in an ethnically diverse sample, and to investigate the relationship between sharing and self- and caregiver-reported sympathy and the anticipation of negatively and positively valenced moral emotions. Based on previous findings (e.g., Takezawa, Gummerum, & Keller, 2006), we hypothesized that there would be an increase in sharing between early and middle childhood. We also extended this research into early adolescence. Although studies using the dictator game have yielded conflicting findings regarding age-related changes in sharing after middle childhood, studies using the related donation paradigm have found that donating increases between middle childhood and early

adolescence (e.g., Barnett, King, & Howard, 1979) and we expected to find similar increases in sharing between ages 8 and 12.

Based on findings from a previous study showing that sympathy predicted sharing in middle childhood (Malti, Gummerum, et al., 2012), we hypothesized that sympathy would emerge as a significant predictor of sharing across age groups. We also expected that the anticipation of NVME and PVME would be positively associated with sharing. The former hypothesis was drawn from research demonstrating a positive relationship between NVME and overt prosocial behavior (Malti & Krettenauer, 2013) and between NVME and sharing behavior in young children (Gummerum et al., 2010). The latter hypothesis was necessarily exploratory, as no previous research has investigated the association between PVME and prosocial behavior. However, based on current theorizing that both negatively and positively valenced moral emotions may facilitate morally relevant behavior (Krettenauer & Johnston, 2011), we hypothesized that PVME would predict increases in sharing.

We examined the role of NVME and PVME in the prediction of sharing in two separate contexts: 1) the omission (or performance) of prosocial actions, and 2) social exclusion (or inclusion) of a peer. We expected to find contextual differences in the effect of NVME/PVME on sharing. This expectation was based on previous findings from social-domain research (e.g., Smetana, 2006) and happy-victimizer research (e.g., Nunner-Winkler, 1999) in which children have differentially evaluated and anticipated emotions following transgressions as they involve different types of moral norms. Specifically, we expected that NVME/PVME anticipated in prosocial contexts would be more strongly related to sharing than NVME/PVME anticipated in social exclusion/inclusion contexts. Finally, we investigated potential interactions between NVME/PVME and sympathy in the prediction of sharing. Related research (e.g., Malti et al.,

2009) has shown that prosocial behavior increases with increased moral motivation (a combined measure of NVME and moral reasoning) when children exhibit low levels of sympathy. This moderation of the relationship between moral motivation and prosocial behavior by sympathy may reflect variation in the importance of self-evaluative responses (i.e. moral motivation) to prosocial behavior when other-oriented emotional responses (i.e. sympathy) are, or are not, already present. Similarly, we expected that, in the current study, self-evaluative emotions (i.e., NVME and PVME) might be more important in the motivation of sharing when other-oriented emotional responses (i.e., sympathy) were not strong. As with previous hypotheses regarding PVME, the expectation of an interaction between PVME and sympathy in the prediction of sharing is exploratory, however we believe that an interaction between self- and other-oriented emotions may be at play in the motivation of sharing.

Method

Participants

The participants in the current study were a community sample of 244 children and their primary caregivers from a suburban area of a major Canadian city. Participants were 78 4-year-olds (M age = 4.44 years, SD = 0.27; 38 girls [49%]); 82 8-year-olds (M age = 8.49, SD = 0.24, 43 girls [52%]); and 84 12-year-olds (M age = 12.50, SD = 0.26, 42 girls [50%]). Participating children and their primary caregivers were fluent in English and the majority of primary caregivers were mothers (79%). As a proxy for socioeconomic status (SES), we asked primary caregivers to report their highest level of education. Fifty-five percent of primary caregivers reported that they had completed a university degree, followed in frequency by the completion of a college degree (23%), graduate degree (14%), and high school diploma (7%). One percent of the primary caregivers chose not to report their level of education. As compared to data from the

2006 Census (Statistics Canada, 2007), the education of participants' primary caregivers is representative of the general education level in the city from which our sample was drawn.

The sample for the current study was ethnically diverse. Ethnic backgrounds reported by primary caregivers include Western European (34%), Eastern European (12%), South Asian (11%), East Asian (4%), Caribbean (4%), West and Central Asian (3%), Southeast Asian (2%), African (2%), Central and South American (2%), and other/multiple origins (34%). Three percent of the primary caregivers chose not to report their ethnic background.

Procedure

Children and their primary caregivers visited the research laboratory once. At the onset of the session, primary caregivers provided written informed consent for their child's participation and children provided informed verbal consent. Each child was tested independently in a separate room while his or her primary caregiver filled out a questionnaire on the child's moral and social development and family demographic information. Each session lasted approximately 45 minutes and consisted of an interview and interactive game with video recording. The testers were undergraduate psychology students who had been extensively trained in the relevant interview techniques. As pilot testing did not indicate order effects, tasks were administered in a fixed order, with vignettes for NVME in social exclusion contexts preceding the dictator game, and the remaining PVME and NVME vignettes following the dictator game in alternating order.

Measures

Sharing. Children's sharing behavior was measured using the dictator game (Kahneman et al., 1986). In line with existing research, 4- and 8-year-olds received 6 stickers (Benenson et al., 2007; Gummerum et al., 2010), whereas 12-year-olds received 6 chocolate coins. The decision to use chocolate coins instead of stickers for the dictator game with 12-year-olds was

made in consultation with other researchers in the field and takes into account the fact that early adolescents generally do not value stickers to the same extent as younger children. Similarly, chocolate coins were not given to 4- and 8-year-olds, as children generally value sweets more highly than adolescents do. To ensure that the perceived attractiveness of the stickers and chocolate coins was comparable, we asked participants to rate the attractiveness of the item they received. There was no significant difference in perceived attractiveness between the stickers and chocolate coins, $t(232) = 1.39, p = .17$. After receiving their stickers/chocolate coins, participants were given the opportunity to share (or not share) any number of these items with an anonymous child of the same age and gender (see Gummerum et al., 2010, for a detailed description of the dictator game). 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 items they received from the experimenter.

Sympathy. Children's sympathy was measured using children's self-reports and ratings by primary caregivers.

Self-reported sympathy. Children's self-reported sympathy was measured with five items from Zhou, Valiente, and Eisenberg's (2003) child-report sympathy scale, which is used widely in research with children (see, for example, Catherine & Schonert-Reichl, 2011; Malti et al., 2009). Participants heard five statements read aloud (e.g., "I often feel sorry for other children who are sad or in trouble") and after each was asked whether the sentence describes him/her or not, and if so, how strongly. Participants were asked to answer spontaneously and not think too long about their answers. Responses were scored as follows: *this is not like me* was scored as 0, *this is sort of like me* was scored as 1, and *this is really like me* was scored as 2. Cronbach's α for the child-reported sympathy scale was .80.

Caregiver-reported sympathy. Primary caregiver-reports of their child's sympathy were obtained using five items from Zhou et al. (2003) (e.g., "My child gets upset when he/she sees another child being hurt"). Primary caregivers read and responded to the five statements as part of the questionnaire package. Responses were scored as follows: *not at all true* was scored as 0, *often not true* was scored as 1, *somewhat not true* was scored as 2, *somewhat true* was scored as 3, *often true* was scored as 4, and *always true* was scored as 5. Cronbach's α for the caregiver-reported sympathy scale was .87.

Anticipation of negatively and positively valenced moral emotions. To measure children's anticipation of NVME and PVME (i.e., feeling guilty, sad or bad and proud, happy, or good in moral contexts), participants responded orally to the open-ended question "how would you feel if you had done this?" after hearing eight vignettes designed to elicit moral emotions (Malti, 2011). The vignettes were adapted from those used in previous research examining the development of moral emotions in the happy-victimizer paradigm (see Arsenio et al., 2006; Malti & Krettenauer, 2013). Each vignette was read aloud with accompanying illustrations. The vignettes represented two distinct moral contexts: 1) the omission (or performance) of prosocial actions, and 2) social exclusion (or inclusion) of a peer. Specifically, children's anticipation of NVME was measured in contexts in which they imagined that they had failed to perform a prosocial action (e.g., "Imagine that you and another boy are both making sand castles. The other boy asks you to help him finish his big sand castle and you say 'no'.") or excluded another child from a social activity (e.g., "Jason and Noah are playing a game on the computer. Another boy asks if he can play too, but Jason says 'no'.").

Children's anticipation of PVME was measured in hypothetical contexts in which they either imagined that they had performed a prosocial action (e.g., "Imagine that a boy asks you if

you can help him open a bag of candy because he cannot open it. You open the bag for him.”) or included another child in a social activity (e.g., “Imagine that you are in school and playing a game with some kids. A new classmate asks you if he can join you playing the game and you say ‘Yes, I am going to let you join us’.”). The gender of the characters in each vignette was matched to that of the participant and the wording of the vignettes was slightly modified to be appropriate for each age group. After hearing each of the eight vignettes, participants were asked to describe how they would feel if they had performed the action in the vignette and these verbal responses were transcribed verbatim by the experimenter. This procedure is consistent with previous research using the happy-victimizer paradigm (Arsenio et al., 2006).

Coding. Participants' first spontaneously mentioned emotion was coded as anger, fear, sadness, happiness, pride, guilt, disgust, anxiety/worry, embarrassment/shame, neutral, feeling good, feeling bad, describing a psychosomatic complaint, or other. In contexts designed to elicit negatively valenced moral emotions, the anticipation of feeling guilty, sad, or bad was coded as representing the anticipation of NVME. Other immoral or amoral negative emotions (e.g., anger, fear, or disgust), along with positive emotions and neutral states were coded as not representing NVME. In contexts designed to elicit positively valenced moral emotions, the anticipation of feeling proud, happy, or good was coded as representing the anticipation of PVME. In line with the coding for NVME, negative emotions and neutral states were coded as not representing PVME. This coding system was based on those used previously in related research (e.g., Malti et al., 2009) and it includes the basic emotional correlates of guilt and pride so that NVME and PVME expectancies can be examined in young children who may not be able to explicitly label complex emotions (i.e., guilt and pride) but can already name their basic emotional correlates

(Malti & Ongley, 2013; Tracy, Robins, & Lagattuta, 2005). Inter-rater reliability for the coding of NVME and PVME was $\kappa = .99$ based on 15% of the data.

Context-specific proportional scores were created by aggregating scores from the two vignettes within each context (i.e., NVME in prosocial omission contexts, NVME in exclusion contexts; PVME in prosocial contexts, and PVME in inclusion contexts): 0 = no anticipation of PVME/NVME in response to either vignette, .50 = anticipation of PVME/NVME in response to one of the two vignettes, and 1.00 = anticipation of PVME/NVME in response to both vignettes. The aggregation of scores within each context was justified as there was a significant association between the two scores within each context: NVME in prosocial omission contexts, $r_{\Phi} (227) = .41, p < .001$, NVME in exclusion contexts, $r_{\Phi} (231) = .21, p < .001$, PVME in prosocial contexts, $r_{\Phi} (231) = .28, p < .001$, and PVME in inclusion contexts, $r_{\Phi} (234) = .32, p < .001$.

Results

Preliminary Analyses

Table 1 displays the means and standard deviations of the study variables by age group and gender. Table 2 displays the correlations between study variables and between study and control variables (i.e., child age, gender, and primary caregiver's level of education). Sharing was positively correlated with child-reported sympathy, NVME in prosocial omission contexts, PVME in inclusion contexts, and child age. Child-reported sympathy was positively correlated with caregiver-reported sympathy, PVME in both contexts, and child age, and negatively correlated with gender (gender was dummy coded, girls = 0, boys = 1). Caregiver-reported sympathy was positively correlated with child age and negatively correlated with primary caregiver's level of education and child gender. NVME in prosocial omission contexts was positively related to PVME in prosocial contexts and both NVME and PVME were positively

correlated across contexts; specifically, children's anticipation of NVME after the failure to perform a prosocial action was positively associated with the anticipation of NVME after excluding a peer, and children's anticipation of PVME after performing a prosocial action was positively correlated with the anticipation of PVME after including a peer.

Age and Gender Differences in Sympathy, Negatively Valenced Moral Emotions, and Positively Valenced Moral Emotions

Six 3 (age group) \times 2 (gender) between-subjects analyses of variance (ANOVAs) were conducted to examine age and gender differences in each of the emotion variables (i.e., child-reported sympathy, caregiver-reported sympathy, NVME in prosocial omission contexts, NVME in exclusion contexts, PVME in prosocial contexts, and PVME in inclusion contexts). For child-reported sympathy, results revealed main effects of age group, $F(2, 238) = 99.05, p < .001, \eta^2 = .45$, and gender, $F(1, 238) = 8.65, p = .004, \eta^2 = .04$. Specifically, girls reported higher levels of sympathy than boys ($M_{\text{girls}} = 1.26, SD_{\text{girls}} = .61$ and $M_{\text{boys}} = 1.08, SD_{\text{boys}} = .56$) and post hoc Bonferroni pairwise comparisons indicated that both 8- and 12-year-olds reported higher levels of sympathy than 4-year-olds ($p < .001$). These main effects were qualified, however, by a significant interaction between age group and gender, $F(2, 238) = 3.47, p = .033, \eta^2 = .03$, with tests of simple effects showing that gender differences occurred in the 8- and 12-year-old age groups only (see Table 1). Main effects of age were also found for caregiver-reported sympathy, $F(2, 234) = 7.88, p < .001, \eta^2 = .06$, PVME in prosocial contexts, $F(2, 232) = 5.89, p = .003, \eta^2 = .05$, and PVME in inclusion contexts, $F(2, 233) = 4.72, p = .010, \eta^2 = .04$. Post hoc Bonferroni pairwise comparisons of age differences revealed that caregivers reported higher levels of sympathy for 12-year-olds than for 4-year-olds ($p < .001$) and 8-year-olds reported higher levels of PVME than 4-year-olds in both prosocial and inclusion contexts ($p = .009$ and p

= .010, respectively). Main effects of gender were also found for caregiver-reported sympathy, $F(1, 234) = 3.884, p = .050, \eta^2 = .02$, and NVME in prosocial omission contexts, $F(1, 231) = 4.62, p = .033, \eta^2 = .02$. Specifically, caregivers reported higher levels of sympathy for girls ($M_{\text{girls}} = 4.91, SD_{\text{girls}} = .73$ and $M_{\text{boys}} = 4.69, SD_{\text{boys}} = .91$) and girls reported higher levels of NVME in contexts of prosocial omission ($M_{\text{girls}} = .55, SD_{\text{girls}} = .43$ and $M_{\text{boys}} = .44, SD_{\text{boys}} = .40$).

Age and Gender Differences in Sharing

Differences in sharing across age groups and gender were examined using a 3 (age group) \times 2 (gender) between-subjects ANOVA. A main effect of age was found for sharing, $F(2, 238) = 12.25, p < .001, \eta^2 = .09$, and post hoc Bonferroni pairwise comparisons revealed that the mean proportion of shared items was higher for 8-year-olds than either 4- or 12-year-olds ($p < .001$ for 8-year-olds vs. 4-year-olds, $p = .049$ for 8-year-olds vs. 12-year-olds). The mean proportion of shared items was also higher for 12-year-olds than 4-year-olds ($p = .029$). This main effect of age was qualified, however, by a significant interaction between age and gender, $F(2, 238) = 4.49, p = .012, \eta^2 = .04$, with tests of simple effects showing that age differences in sharing occurred for boys only, $F(2, 238) = 15.38, p < .001$ and $F(2, 238) = 1.32, p = .269$, for boys and girls, respectively (see Table 1). Tests of simple effects also revealed a significant gender difference in sharing for 4-year-olds (see Table 1). In line with previous research and our hypotheses, we conducted additional analyses to examine whether the proportion of children who share nothing decreases with age (Gummerum et al., 2010) and the current results indeed indicated that sharing nothing was a frequent sharing distribution for 4-year-olds only (41% vs. 3% and 1%, for 4-, 8-, and 12-year-olds respectively). Four-year-olds chose to share nothing more often than both 8-year-olds, $\chi^2(1) = 29.33, p < .001$, and 12-year-olds, $\chi^2(1) = 38.10, p < .001$, with no significant difference in sharing nothing between 8- and 12-year-olds, Fisher's exact test, *ns*.

Prediction of Sharing Behavior by Sympathy, Negatively Valenced Moral Emotions, and Positively Valenced Moral Emotions

To test the predictive effects of sympathy, NVME, and PVME on sharing, two separate hierarchical regression models were run with sharing as the dependent variable in each. As previous research has found associations between sharing and age (Benenson et al., 2007; Malti, Gummerum, et al., 2012), gender (Benenson et al., 2007; Leman et al., 2009) and SES (Carlo, Padilla-Walker, & Day, 2011), we entered child's age group, gender, and primary caregiver's level of education as control variables in step 1 of each regression model. In Model 1, we entered child-reported sympathy, caregiver-reported sympathy, NVME in prosocial omission contexts, and NVME in exclusion contexts as predictor variables in step 2. Interaction terms were entered in step 3. In Model 2, we entered child-reported sympathy, caregiver-reported sympathy, PVME in prosocial contexts, and PVME in inclusion contexts as predictor variables in step 2. Interaction terms were again entered in step 3.

All predictor variables were centered at the mean, with the exception of gender and age group. Interaction terms were created by calculating the products of the mean-centered variables (Aiken & West, 1991). In preliminary analyses, we tested all possible interactions between control and emotion variables. We also tested the hypothesized interactions between NVME/PVME (both prosocial omission/prosocial and exclusion/inclusion contexts) and sympathy (both child- and caregiver reports). Only interactions that were significant in preliminary analyses were retained in the final models.

Table 3 displays the results of the final analyses. Results from Model 1 indicated that sharing behavior is predicted by child-reported sympathy, NVME in prosocial omission contexts, and by the interactions of (a) child-reported sympathy and age group, and (b) NVME in prosocial

omission contexts and child-reported sympathy, $R^2 = .18$, $F(9, 222) = 5.23$, $p < .001$. Cohen's f^2 is .22, which indicates a medium effect size (Cohen, 1988). To plot the interaction between child-reported sympathy and age group, we used the procedure recommended by Aiken and West (1991) and the worksheet created by Dawson (n.d.) for plotting interactions between two unstandardized variables. We performed t tests on three simple slopes, which represented the regression of sharing on child-reported sympathy for each of the three age groups, to determine if they differed significantly from zero. For each age group, simple slopes were evaluated at low and high levels of sympathy. The low and high values of sympathy correspond to the response anchors from Zhou et al.'s child-report sympathy scale (2003). A mean sympathy score (participant's average score across 5 items) of 0 indicates weak or no identification with sympathetic statements ("this does not sound like me") and a mean sympathy score of 2 indicates strong identification with sympathetic statements ("this is really like me"). The simple slopes for 4-year-olds, 8-year-olds, and 12-year-olds were .16, .06, and -.03, $p < .001$, ns , and ns , respectively. As shown in Figure 1, 4-year-olds' sharing increased significantly with level of sympathy, whereas 8- and 12-year olds' sharing did not depend on level of sympathy.

To plot the interaction between NVME in prosocial omission contexts and child-reported sympathy and to test the significance of the simple slopes, we again used the procedure described by Aiken and West (1991) and the worksheet developed by Dawson (n.d.) for unstandardized variables as described above. Low and high levels of NVME correspond to the proportion of NVME (prosocial omission) vignettes to which children responded with reports of feeling guilty, sad, or bad (i.e., "low NVME" corresponds to scores of 0 – participants did not report feeling guilty, sad, or bad in response to either of the prosocial omission vignettes; "high NVME" corresponds to scores of 1 – participants reported feeling guilty, sad, or bad in response to both

prosocial omission vignettes). Low and high levels of sympathy correspond to the response anchors from Zhou et al.'s child-report sympathy scale (2003) as described above. When sympathy was high, low and high levels NVME had no implications for sharing (simple slope $b = -.10$, *ns*); however, in cases in which sympathy was low, NVME was associated with sharing, with high levels of NVME associated with higher sharing than low NVME (simple slope $b = .35$, $p < .001$; see Figure 2).

The results of Model 2 showed that sharing behavior is predicted by an interaction between child-reported sympathy and age group, $R^2 = .10$, $F(8, 224) = 3.00$, $p = .003$. Cohen's f^2 is .11, which indicates a small effect size (Cohen, 1988). As in Model 1, the interaction effect revealed that 4-year-olds' sharing increased significantly with level of self-reported sympathy, whereas 8- and 12-year olds' sharing did not depend on level of sympathy.

Discussion

This study sought to investigate the development of sharing and its associations with moral emotions across early childhood, middle childhood, and early adolescence. Because previous developmental studies have only rarely investigated the role of moral emotions (i.e., sympathy, NVME, and PVME) in the development of children's sharing, this study contributes to our understanding of the affective-moral antecedents of other-oriented behavior, an issue of key importance to the development of cooperation, fairness, and care.

Existing research has found that sharing increases significantly between early and middle childhood (Benenson et al., 2007; Fehr et al., 2008; Harbaugh et al., 2002; Kogut, 2012). A consistent developmental trend arises in the current study, although it is limited to boys. The increase in boys' sharing between ages 4 and 8, as well as the comparative frequency with which 4-year-olds of both sexes chose to allocate nothing to a hypothetical peer, provide support for the

idea that inequality aversion and the internalization of fairness norms develop sharply between early and middle childhood, particularly for boys (see Fehr et al., 2008; Kogut, 2012). For girls in the current study, however, a preference for fairness in sharing was present in early childhood. These gender differences in sharing early in development are consistent with results from a longitudinal study by Malti, Gummerum, and colleagues (2012) and may be a result of gender differences in parents' socialization of young children; specifically, parents' more frequent and consistent reinforcement of altruistic behavior for girls (Gummerum et al., 2008). Differences in nurturance and affection have been linked to children's prosocial behavior and the two are typically directed more towards girls than boys (Radke-Yarrow, Zahn-Waxler, & Chapman, 1983). Such gender differences in socialization may contribute to the earlier emergence of fairness and equality in girls' sharing behavior than in boys'.

Surprisingly, and contrary to our prediction, we found that girls' sharing remained stable between middle childhood and early adolescence, while boys' sharing decreased between the two age groups. These findings add new information to our understanding of the development of sharing from childhood to adolescence. Previous research has indicated a general age-related increase extending from middle childhood into adolescence in children's overt prosociality (e.g., Eisenberg & Fabes, 1998) and donation behaviors (e.g., Barnett et al., 1979). The findings from our study may diverge from those measuring overt prosociality as there is no social approval to be gained from sharing in the dictator game, whereas this is not the case for the public prosocial behaviors that comprise overt prosociality. The divergence of our findings from those of donation studies may be related to the aforementioned high need that is explicitly ascribed to recipients of donations, whereas the need of recipients in the dictator game is not explicitly discussed. The limited set of existing studies that have used the dictator game to examine change

in sharing across middle childhood and early adolescence have yielded conflicting results (e.g., Harbaugh et al., 2002; Leman et al., 2009). Our findings for girls are similar to developmental findings (across gender) from a related study by Almås and colleagues (2010), in which dictator game allocations of children in Grade 5 were equivalent to those of early adolescents in Grade 7. The stability of girls' preference for equal sharing in the current study resonates well with existing work on gender differences in adult altruism. Research by Andreoni and Vesterlund (2001), for example, finds that women, unlike men, are "equalitarians" who prefer to share equally across multiple variations of the dictator game. The decrease in the equality of boys' sharing after middle childhood, however, may indicate the increasing role that competition plays in boys' sharing as they enter adolescence (Houser & Schunk, 2009). In the current study, an implicit context of competition with the hypothetical male recipient in the dictator game may have served to decrease adolescent boys' sharing, while no such competitive pressure mitigated the sharing of adolescent girls. It may also be the case that the observed decrease in boys' sharing between ages 8 and 12, compared to the stability of girls' sharing, is related to an increase in gender differentiation of values in adolescence. Adolescent boys may increasingly adopt stereotypically "male" values that are associated with more self-oriented sharing allocations (i.e., values of power, achievement, and hedonism) while girls may adhere to stereotypically "female" values associated with equality (i.e., values of benevolence and universalism) (Schwartz & Rubel-Lifschitz, 2009). It is also important to consider the relationship between the sharer and recipient and the differential influence this relationship might exert on sharing across ages and genders. For example, existing work has demonstrated that between middle childhood and early adolescence, equal sharing with friends becomes more important and more frequent than equal sharing with non-friends (Berndt, 1985). Because the

dictator game typically involves sharing with an anonymous peer, this particular measure of sharing may elicit less generosity than a task in which the recipient is a friend. Future longitudinal research that manipulates the context in which sharing occurs, including the relationship between sharer and recipient, is warranted to further investigate gender and developmental differences in sharing allocations from middle childhood to adolescence.

Importantly, our results on moral emotions and sharing suggest that there may be two compensatory emotional pathways to sharing: one via sympathy and one via NVME (i.e., feeling guilty, sad, or bad). More specifically, the current results show that NVME anticipated in prosocial omission contexts significantly predict sharing. However, high levels of NVME were particularly important for sharing when children's level of self-reported sympathy was low. This finding may imply that NVME serves as a compensatory emotion promoting sharing when levels of sympathy are low. Prior theory has drawn important links between empathy/sympathy and NVME (specifically, guilt) as antecedents of prosocial action (Hoffman, 2000) but the ways in which sympathy and NVME independently and conjointly contribute to sharing have not yet been elaborated empirically. Our findings suggest that NVME may compensate for a lack of sympathy in motivating children and adolescents to share valuable resources. In related research, Carlo, McGinley, Davis, and Streit (2012) found support for two distinct pathways in the prediction of young adults' prosocial tendencies. Similarly to the current study, one pathway was based on NVME (specifically, guilt) and the other on sympathy. Carlo and colleagues (2012) proposed that guilt motivates prosocial tendencies by encouraging individuals to live up to their moral standards, while sympathy motivates prosocial tendencies by encouraging individuals to reduce distress in others. Our results suggest that children with low levels of other-oriented concern (i.e., sympathy) may be motivated to share instead by negative self-evaluative moral

emotions. In contrast, children who have high levels of other-oriented concern (i.e., sympathy) are motivated to share independently of their level of anticipated self-evaluative moral emotions because they want to reduce distress in others.

We also found that self-reported sympathy is of particular importance to the prediction of sharing in early childhood, but not beyond. This finding shows that the importance of sympathy in children's decisions to share or not share depends on development. Many 4-year-olds have not yet internalized norms of fairness and equality and, as is evident by the large proportion (approximately 40%) of 4-year-olds who chose to keep all of their stickers for themselves, children's early sharing allocations often prioritize personal desires (see Arsenio et al., 2006). It is all the more intriguing that 4-year-olds who are high in sympathy diverge from this pattern. They are motivated to share by concern for others, and their sharing allocations mirror those of children in middle childhood and early adolescence. The affective experience of sympathy in early childhood may lead to a general orientation to consider the needs of others and the early development (relative to peers with low levels of sympathy) of norms of fairness and care (see Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008; Malti, Gummerum, et al., 2012).

We also found evidence for the fact that the association between moral emotions and sharing is context-specific. Specifically, only NVME anticipated in contexts in which children failed to behave prosocially yielded predictive effects on sharing. This was not the case for NVME anticipated in contexts of social exclusion. This differential finding across the two moral transgression contexts suggests that behavior that is strongly prosocial (i.e., altruistic sharing) is only predicted by NVME anticipated within closely related prosocial contexts (i.e., NVME anticipated when one fails to help or share). The anticipation of NVME in social exclusion contexts is likely to be too distant an affective process to be relevant to decisions regarding

whether one will or will not share. This finding extends previous research on the domain-specificity of children's anticipated emotions and reasoning following different types of rule violations (Malti, Ongley, Dys & Colasante, 2012; Smetana, 2006) by linking domain-specific moral emotions to domain-specific prosocial behaviors.

In contrast to NVME, PVME (i.e., feeling proud, happy, or good) did not predict sharing. This finding suggests that PVME, though associated at the bivariate level with sharing, sympathy, and NVME in prosocial omission contexts, are not powerful enough to elicit costly sharing behavior when other morally relevant emotional processes are controlled for. It may be the case that children, who are taught by teachers and parents to feel proud of many diverse accomplishments, experience PVME too frequently and too broadly for it to motivate the allocation of valuable resources to others. It may also be the case that sympathy and NVME are more salient than PVME in issues of fairness and equality. Alternatively, the finding that there is a positive bivariate correlation between sharing and PVME in inclusion contexts, but not sharing and PVME in prosocial contexts, may indicate that the cost of the behavior that elicits PVME is an important factor in the association between PVME and sharing. The inclusion of an out-group peer is a costly social behavior, having potential consequences for in-group functioning and for the including child's social reputation. As compared to other prosocial behaviors (e.g., helping), social inclusion may incur greater costs, and inter-individual differences in the anticipation of PVME in high cost contexts may be differentially related to prosocial outcomes.

There are several limitations to the current study. Firstly, it relies solely upon cross-sectional data, which does not allow for the investigation of change in individual differences related to sharing over time. Future studies on the intra-individual development of sharing and moral emotions are warranted. Secondly, the magnitude of the association found between NVME

and sharing may have been limited by the fact that the vignettes used to measure the anticipation of NVME included depictions of both helping and sharing and were not limited to sharing behavior specifically. Research on task specificity (Carlo, Knight, McGinley, Goodvin, & Roesch, 2010) has suggested that a high degree of similarity in the measurement of related constructs yields greater predictive power. While this does not call the relationship between NVME in prosocial omission contexts and sharing into question, a higher degree of similarity between the two measures may have yielded a stronger association between sharing and NVME in prosocial omission contexts and may have allowed for the regression model including NVME to account for a higher proportion of overall variance in sharing. The same issue of task specificity may have influenced that lack of association found between PVME and sharing. Thirdly, the participants in this study, though ethnically diverse and representative of the population from which they were drawn, are mainly from families with mid- to high-SES and as a result, the current findings may not generalize to children and adolescents from less advantaged backgrounds. As previous research has found variations in sharing by SES (Benenson et al., 2007), future work should seek to broaden the range of socioeconomic backgrounds that are represented in participant populations.

Despite these limitations, the current study has several notable strengths. Most importantly, this study is among the first to examine the role of moral emotions in the development of children's sharing. Additionally, we investigated these relations in an ethnically diverse sample and in a broad age range spanning the years between early childhood and early adolescence. As a result, the current study provides valuable insight into the predictive role of moral emotions in sharing behavior and thus contributes to our understanding of why humans develop the willingness to take the welfare of others into account.

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Table 1

Means and Standard Deviations of Study Variables by Age Group and Gender

Variable	4-Year-Olds (<i>n</i> = 78)		8-Year-Olds (<i>n</i> = 82)		12-Year-Olds (<i>n</i> = 84)	
	Girls <i>M</i> (<i>SD</i>)	Boys <i>M</i> (<i>SD</i>)	Girls <i>M</i> (<i>SD</i>)	Boys <i>M</i> (<i>SD</i>)	Girls <i>M</i> (<i>SD</i>)	Boys <i>M</i> (<i>SD</i>)
Sharing	0.39 (0.29)* ^a	0.25 (0.29)* ^A	0.46 (0.22) ^a	0.51 (0.16) ^B	0.40 (0.16) ^a	0.41 (0.12) ^C
Child-reported sympathy	0.59 (0.52) ^a	0.63 (0.51) ^A	1.52 (0.42)* ^b	1.21 (0.48)* ^B	1.62 (0.27)* ^b	1.40 (0.36)* ^B
Caregiver-reported sympathy	4.49 (0.77) ^a	4.59 (0.85) ^A	5.05 (0.50)* ^b	4.53 (1.04)* ^A	5.13 (0.75) ^b	4.94 (0.79) ^A
NVME in prosocial omission contexts	0.57 (0.48) ^a	0.39 (0.42) ^A	0.56 (0.43) ^a	0.47 (0.40) ^A	0.54 (0.39) ^a	0.45 (0.40) ^A
NVME in exclusion contexts	0.55 (0.43) ^a	0.57 (0.37) ^A	0.49 (0.37) ^a	0.59 (0.38) ^A	0.51 (0.41) ^a	0.50 (0.41) ^A
PVME in prosocial contexts	0.72 (0.34) ^a	0.71 (0.41) ^A	0.92 (0.22) ^b	0.86 (0.26) ^A	0.85 (0.28) ^{ab}	0.76 (0.35) ^A
PVME in inclusion contexts	0.73 (0.38) ^a	0.78 (0.40) ^A	0.93 (0.18) ^b	0.88 (0.27) ^A	0.83 (0.31) ^{ab}	0.76 (0.32) ^A

Note. NVME = Negatively valenced moral emotions. PVME = Positively valenced moral emotions. *Asterisks indicate significant gender differences ($p < .05$) within age group. ^{ab}Different lower case letter superscripts indicate significant age differences ($p < .05$) for girls. ^{ABC} Different upper case letter superscripts indicate significant age differences ($p < .05$) for boys.

Table 2
Correlation Matrix of Study and Control Variables

Variable	1	2	3	4	5	6	7	8	9
1. Sharing	-								
2. Child-reported sympathy	.25***	-							
3. Caregiver-reported sympathy	-.02	.19**	-						
4. NVME in prosocial omission contexts	.18**	.11 [†]	.04	-					
5. NVME in exclusion contexts	.00	.02	-.08	.39***	-				
6. PVME in prosocial contexts	.04	.16*	.01	.17**	-.05	-			
7. PVME in inclusion contexts	.14*	.14*	-.10	.12 [†]	.04	.46***	-		
8. Primary caregiver's level of education	.12 [†]	.11 [†]	-.16*	.02	.03	.04	.00	-	
9. Child age	.15*	.62***	.24***	.02	-.06	.11	.05	.07	-
10. Child gender	-.06	-.16*	-.13*	-.14*	.04	-.08	-.05	.15*	-.01

Note. NVME = Negatively valenced moral emotions. PVME = Positively valenced moral emotions. Child age is measured in years.

Child gender is dummy-coded (girls = 0, boys = 1).

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Hierarchical Multiple Regression Analyses Predicting Sharing from Child- and Caregiver-Reported Sympathy, NVME in Prosocial Omission and Exclusion Contexts, and PVME in Prosocial and Inclusion Contexts

Predictor	Model 1		Model 2	
	$\Delta R^2 / \Delta F^2$	β	$\Delta R^2 / \Delta F^2$	β
Step 1	.03/2.36 [†]		.03/2.54 [†]	
Age group		.09		.11 [†]
Gender		-.07		-.07
Primary caregiver's level of education		.14*		.13*
Step 2	.06/3.87**		.05/2.84*	
Age group		-.04		-.02
Gender		-.01		-.03
Primary caregiver's level of education		.11		.11 [†]
Child-reported sympathy		.23**		.22**
Caregiver-reported sympathy		-.06		-.02
NVME in prosocial omission contexts		.18*		
NVME in exclusion contexts		-.10		
PVME in prosocial contexts				-.04
PVME in inclusion contexts				-.13 [†]
Step 3	.08/11.05***		.02/4.45*	
Age group		-.06		.00
Gender		-.02		-.06
Primary caregiver's level of education		.07		.11
Child-reported sympathy		.17*		.15
Caregiver-reported sympathy		-.03		-.01
NVME in prosocial omission contexts		.16*		
NVME in exclusion contexts		-.09		
PVME in prosocial contexts				-.05
PVME in inclusion contexts				.13 [†]
Child-reported sympathy x age group		-.17*		-.15*
NVME in prosocial omission contexts x child-reported sympathy		.26***		
Total R^2	.18***		.10**	
N	232		233	

Note. NVME = Negatively valenced moral emotions. PVME = Positively valenced moral emotions.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

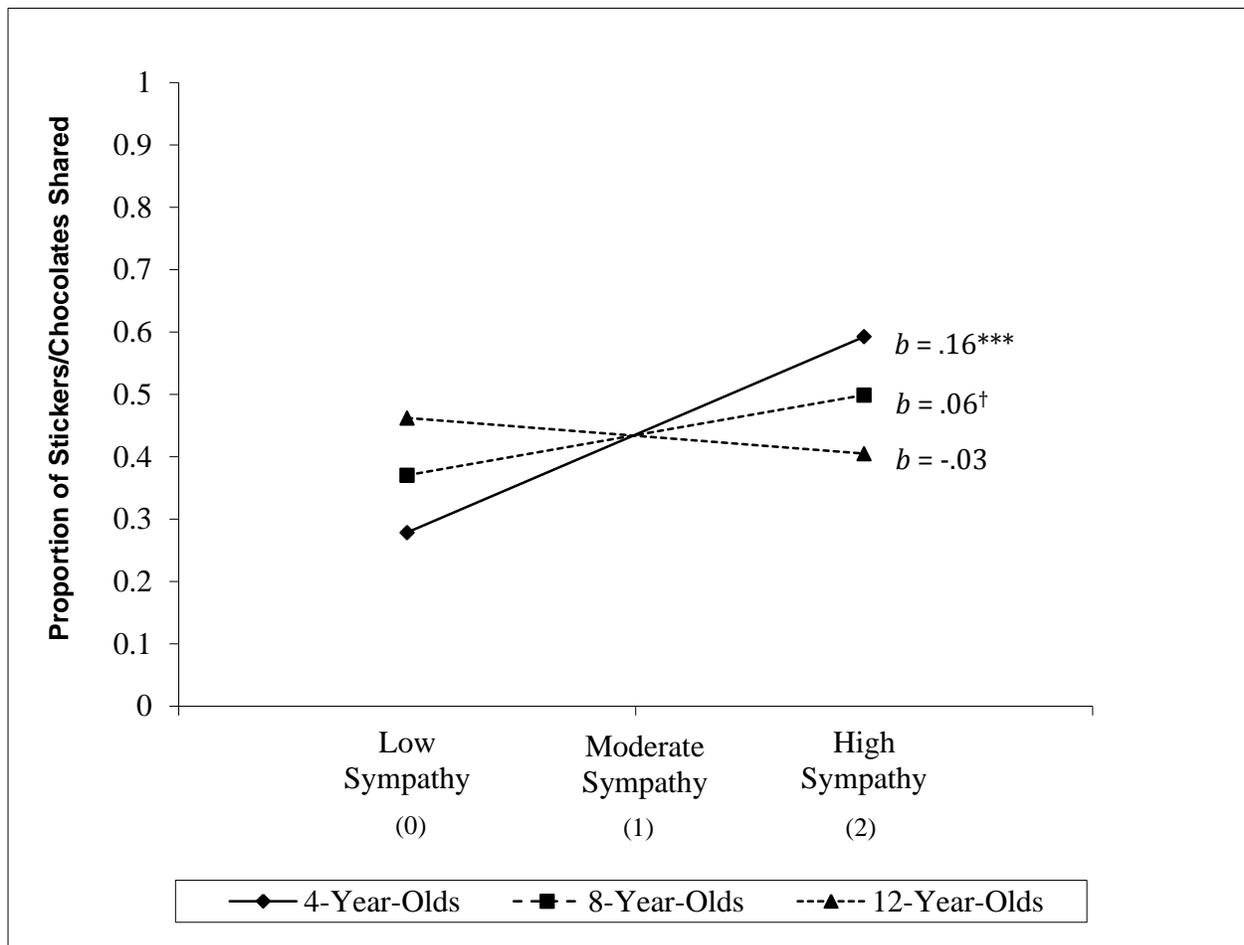


Figure 1. Interaction of child-reported sympathy with age group: Prediction of sharing. Values for low, moderate, and high sympathy correspond to mean scores of 0, 1, and 2 on Zhou et al.'s child-report sympathy scale (2003). These scores reflect weak, moderate, and strong identification with sympathetic statements, respectively.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

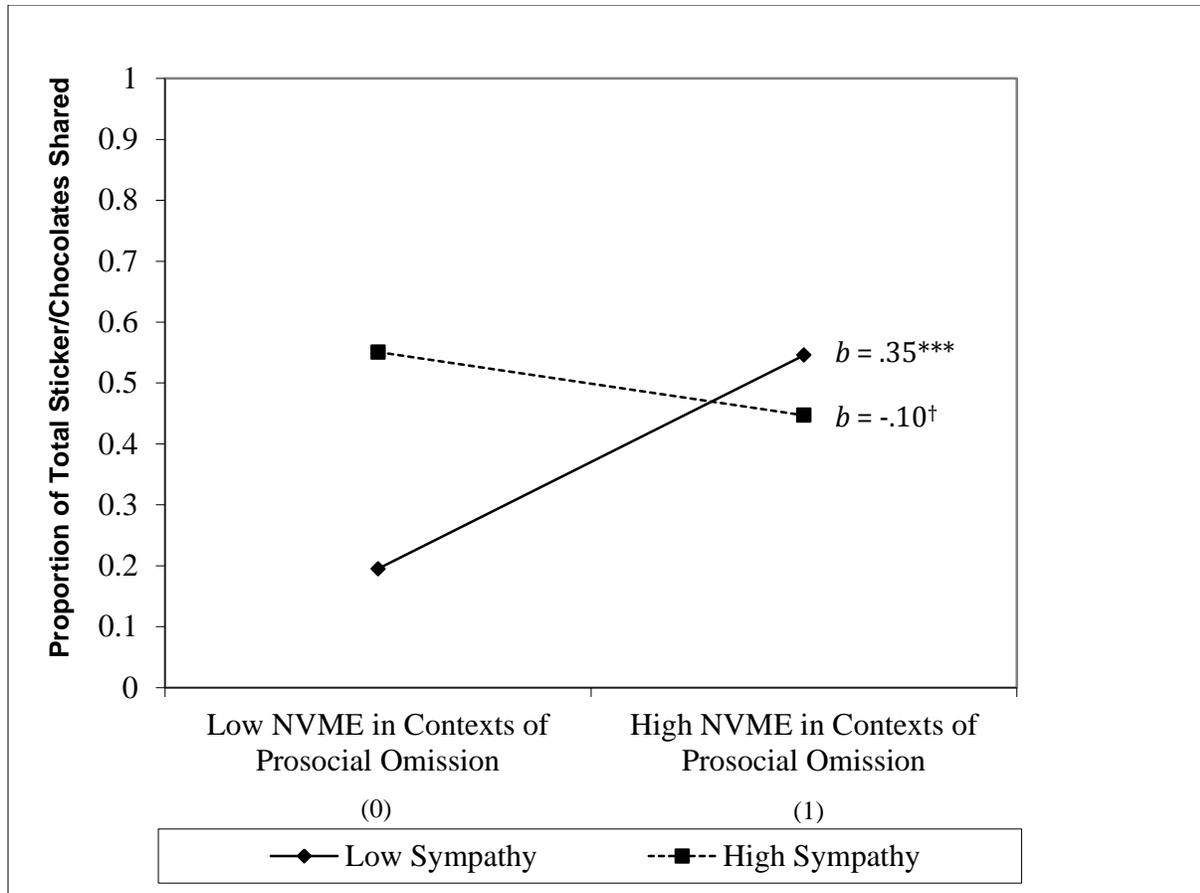


Figure 2. Interaction of child-reported sympathy with NVME in prosocial omission contexts: Prediction of sharing. NVME = Negatively valenced moral emotions.

Low and high levels of NVME correspond to the proportion of NVME vignettes to which children responded with reports of feeling guilty, sad, or bad (i.e., “low NVME” corresponds to scores of 0 – participants did not report feeling guilty, sad, or bad in response to either of the prosocial omission vignettes; “high NVME” corresponds to scores of 1 – participants reported feeling guilty, sad, or bad in response to both prosocial omission vignettes).

Values for low and high sympathy correspond to mean scores of 0 and 2 on Zhou et al.’s child-report sympathy scale (2003). These scores reflect weak and strong identification with sympathetic statements, respectively.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.