

Sharing is Caring: Children's Understanding and Use of Prosocial Intentions

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## Abstract

Humans are social beings that rely heavily on our cooperative relationships (Tomasello et al., 2012). This predisposition to engage in cooperation and establish relationships likely accounts for our success as a species (Tomasello, 2009). In order to form these relationships, however, we must identify individuals who promise to be reliable, beneficial partners. Intentions help individuals navigate this difficult challenge, as they allow individuals to distinguish between self-interested versus truly generous partners and generate accurate predictions about their potential partners and future cooperation (Cushman, 2008; Falk & Fischbacher, 2006; Gul & Pesendorfer, 2016; Lopes, 1994). In three studies with 4- to 9-year-old children, this dissertation aimed to explore when humans develop the ability to understand and make use of others' prosocial intentions and how altruistic and egoistic prosocial intentions shape children's predictions of others' behavior, evaluations of the prosocial individuals, and guide their own cooperative behavior.

In the first study (Chapter 2), we aimed to investigate children's lay theories of others' prosocial intentions. The results indicate that 4- to 9-year-old children in the sample we tested primarily believe that people act out of other-oriented altruistic motives rather than egoistic and self-serving motives. This study also found that parental values and socialization were associated with children's prosocial intention assumptions: Parents who valued caring for others and community loyalty were more likely to have children who thought the prosocial behavior was motivated by care-based motivations. This study is one of the first to show how children interpret someone's ambiguous prosocial motives

and provide context for how these preconceptions can shape children's perceptions and responses to their social world.

The second study (Chapter 3) expanded upon this work and examined experimentally how 4- to 8-year-old children react to others' prosocial intentions and use them to navigate their social world. The study found that children as young as six years old incorporate intentions into their evaluations of someone's prosocial behavior (i.e., goodness or badness) and whom they would solicit help from. Eight and nine-year-olds were the only age group in this study to think that the recipient of prosocial behavior should reward someone who acts out of altruistic care-based motives and that the Altruistic prosocial individual will be more prosocial in the future. Additionally, 8- and 9-year-olds predicted that the recipient of the prosocial action would feel mixed emotions (i.e., "both happy and unhappy") after someone is prosocial out of the egoistic desire for reciprocity. Interestingly, even children as young as four used intentions to make predictions about the relationship between the prosocial individuals and the recipients of their prosocial behavior, such that children at all ages thought the recipient would have a closer relationship and desire to affiliate more with someone whose prosocial behavior was motivated by concern for another's welfare.

The aim of the third study (Chapter 4) was to examine how children use altruistic and egoistic intentions to inform their *own* cooperative behaviors and predictions of their prosocial partners' behavior. Using a repeated Trust Game, the study found that 6- and 7-year-olds as well as 8- and 9-year-olds shared more resources with the Altruistic prosocial partner when their allotment was contingent on the prosocial partner's sharing, and this may be an effort to invest in the relationship and reward the intentions behind

their Altruistic prosocial partner's actions (McCabe et al., 2003). Children in these age groups also indicated that they felt more mixed emotional states upon receiving resources from a prosocial partner motivated by a desire for reciprocity. Unlike the moral evaluations in Chapter 3, 8- and 9-year-olds were the only age group to evaluate the Egoistic prosocial partner as less good than the Altruistic prosocial partner but all children, regardless of age, thought that the Altruistic prosocial partner was “nicer” than the Egoistic prosocial partner in the forced-choice questions.

Taken together, these studies indicate that children from quite early in development can distinguish between prosocial individuals who act with egoistic self-serving versus altruistic other-oriented motives. As children age, their use of these intentions becomes more sophisticated. It begins to inform what is considered morally good, predictions of others' behavior, and whom they desire to affiliate with. This crucial skill allows individuals to choose reliable and trustworthy future partners, actively expanding their cooperative networks and allowing individuals to establish new positive, cooperative relationships. Thus, allowing humans to extend cooperation beyond kin and previously established cooperative partners, thereby contributing to the emergence and success of our large-scale cooperative societies.

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## Introduction

Humans depend on social relationships for survival across the lifespan, performing tasks such as creating, obtaining and sharing resources, child-rearing, detecting and responding to threats, and mutual exchange of goods and services (Ainsworth, 1989; Caporael & Brewer, 1995; Waal & Aureli, 1996). Large-scale cooperation of this kind often requires that we go beyond our naturally occurring kin relationships to establish cooperative partnerships with new individuals (Boyd & Richerson, 1989; Van den Berghe & Alexander, 1988).

Cooperative relationship formation has a long evolutionary history borne out of necessity. Our stone tool-wielding evolutionary ancestors were competing for limited resources with an ever-growing population of terrestrial monkeys due to a period of global cooling and drying (Tomasello, 2018). With increased competition from other species, early humans needed new and adaptive means of competing and obtaining valuable resources. In the Pleistocene, approximately 400,000 years ago, our ancestors became increasingly interdependent and began obtaining most of their daily sustenance through active cooperation (Stiner 2019). Cooperation thus became essential for our early ancestors' survival. These cooperative relationships allow individuals to complete tasks that would otherwise be difficult to achieve alone.

Although cooperation requires an individual to pay a personal cost, human cooperation is ubiquitous. The evolutionary necessity of cooperation gave increasing value to the concept of partner choice, wherein individuals can choose with whom to interact. Individuals who were unable to form effective collaborative relationships due to communication ineffectiveness, inability to form joint goals, or general

uncooperativeness were not selected as partners and so went without the benefits of cooperation (Tomasello, 2018). Cooperation and partner choice form the foundation of our social relationships, shape our societal structures, and shape what is morally right and just (Tomasello et al., 2012). To this end, a “we is greater than me” morality emerged, wherein cooperative partners set aside the selfish individuality of “I” and “you” in favor of the collaborative “we” (Tomasello 2018).

Partner choice through cooperative foraging established and perpetuated new ways of relating to others for early humans. Suppose an individual depends upon partners for foraging success. Providing help and investing in their well-being is advantageous to ensure the partner is in good shape for future outings (Tomasello, 2018). These cooperative actions often involve a cost (e.g., resources, time, energy, etc), so investing in the right cooperative relationships is imperative. The cooperative partner must also be invested in the prosocial individual's well-being or may be left without valuable resources (Bartlett & DeSteno, 2006; Frank, 1988; Nowak & Highfield, 2011). One's survival then depends on identifying motivated and invested collaborative partners. Thus, we face a critical social task of identifying cooperative partners who promise to be dependable and trustworthy. How do we solve this challenge? This is the broad question at the heart of the current dissertation.

### **Past Behavior and Partner Choice**

Many evolutionary tools have been selected to enable individuals to identify potentially beneficial cooperative partners. Cooperation requires that an individual can identify those who are cooperative, empathetic, helpful, or likely to be so in the future, requiring an ability to analyze others' social behaviors. Given that information about new

potential partners is limited, individuals must rely on others' previous behavior to evaluate and make accurate predictions about their future cooperative behavior (Hamlin, 2013). Adults readily use an individual's past behavior when choosing cooperative partners. For instance, choosing to help someone, or refusing to do so, has an impact on an individual's reputation in their group, which affects the group members' generosity toward that individual (Wedekind & Milinski, 2000). This capacity emerges early in development: An individual's history of cooperative behavior influences whether children choose that individual as a social partner (Li et al., 2020; Olson & Spelke, 2008; Vaish et al., 2010).

By the end of their 1st year, infants understand that agents can work together toward shared goals, categorize goal-helping as positive and goal-hindering as negative, and understand how being helped and hindered influences one's social preferences (Henderson & Woodward, 2011; Kuhlmeier et al., 2003; Premack & Premack, 1997). In a series of studies by Hamlin and colleagues, experimenters presented 6- to 10-month-old infants with characters who either hindered or helped a third character achieve its goal of climbing up a hill. When presented side by side, infants prefer those who helped versus those hindered, as indicated by the infant's desire to interact with and reach toward the character (Hamlin et al., 2007). Furthermore, children preferred a helping individual to a neutral individual and a neutral individual to a hindering individual. In another study, Hamlin and colleagues found that even 3-month-olds prefer those who help others, which extends to a variety of prosocial behaviors (Hamlin & Wynn, 2011). Importantly, their preferences are based on the social nature of their actions, such that infants prefer those who behave prosocially, not just those who complete a goal (Hamlin & Wynn, 2011;

Hamlin & Van de Vondervoort, 2018). These results suggest that from remarkably early in development, children pay attention to others' past social behaviors to guide their preferences and desire to affiliate with that individual.

At 12 months of age, infants begin to expect individuals to treat others fairly, as long as everyone has contributed equally to the cooperative endeavor or is in the same group (Geraci & Surian, 2011; Sloane et al., 2012). When presented with two characters, one who distributed resources fairly and another who distributed the resources unfairly, 12- to 18-month infants expected others to prefer the fair distributor and were surprised when a new character approached the unfair distributor rather than a fair distributor as indicated by looking longer at this unexpected behavior. The agent approached the unfair distributor, indicating a violation of their expectations (Geraci & Surian, 2011). As with children's preference for the prosocial individual in research by Hamlin and colleagues, the infants had a greater desire to interact with and were more likely to reach for the prosocial agent (i.e., fair distributor) over an antisocial agent (i.e., unfair distributor). These results indicate that children prefer more than just prosocial individuals who help. Young infants may have a more complex understanding of prosocial behavior and use an individual's past fairness to guide their desire to affiliate and preferences for that individual.

Furthermore, work with slightly older children, around 3.5-years-old, indicated that children not only prefer to interact with prosocial individuals, but the character's antisocial or prosocial behavior also influences their own prosocial behavior, such that 3.5-year-olds distribute more resources to characters who have previously shared in a third-party context than to individuals who have not shared (Olson & Spelke 2008). This

growing body of work suggests that even preverbal infants understand several types of cooperative behaviors between third parties. They use this information to form positive and negative impressions of other people's social acts and guide their prosocial behavior and new relationships.

### **Moral Motivations and Partner Choice**

Importantly, sophisticated moral judgments consider more than just the consequences of an individual's actions (Vaish, Carpenter, Tomasello, 2010). Seeking reliable cooperation partners additionally requires observing and evaluating whether our potential partners possess the right motivations for acting morally. Accurate predictions about cooperative partners must rely on the individuals' observable actions *and* the internal states underlying those actions, given many potential factors that can motivate an individual's actions (Cushman, 2008; Falk & Fischbacher, 2006). Adults consider whether an individual acted cooperatively and the *mental states* that drove the action (Cushman, 2008; Falk & Fischbacher, 2006). A growing body of evidence demonstrates that an individual's intentions may influence moral judgments and the desire to punish or reward more than behavioral outcomes alone (Cushman, 2008; Cushman et al., 2013; Killen & Smetana, 2008; Young et al., 2007). Furthermore, mental states and psychological factors, such as character traits, are better indicators and thus more useful in tracking an individual's identity across time than physical traits, such as the trustworthiness of a face or observable behavior (Brooks, 2014). It may be sufficient to judge a person's observable actions if we only interact with them once, but ongoing partnerships require us to make better predictions about our potential cooperative partners. Internal states provide better information for the predictions because they

indicate something about the person themselves rather than the situational circumstances they happened to be in this time.

### **Moral Motivations and Antisocial Behavior**

Most research on children's use of intention information concerns children's understanding of and responses to the intentions behind harmful behaviors (Cushman et al., 2013; Margoni & Surian, 2017). This research indicates that an adult's pattern of judgments results from a developmental shift. An outcome-focused analysis of harmful actions dominates the moral judgments of young children. In contrast, the moral judgments of older children and adults focus instead on the intention to produce harm. Critically, harmful intentions alone are sufficient to warrant a negative moral evaluation in mature children and adults, even without any harmful consequence (Cushman et al., 2013). The emergence of an intent-based moral judgment during childhood has been a core aspect of developmental theories since Piaget's (1932) seminal work. Piaget presented children with stories involving two characters: one who acted in a good-intentioned way but caused serious material damage. One who acted in a bad-intentioned way but caused less severe damage. Piaget then asked children which character was naughtier and should be punished. He reported a developmental change between ages 6 and 10 from a propensity to offer evaluations based on outcome to a tendency to offer evaluations based on intention.

More recent work demonstrates that intentions and outcomes have distinct roles in judgments of moral blameworthiness and whether the agent deserves to be punished (Cushman et al., 2013). 4- to 8-year- children heard stories about characters who performed harmful actions (e.g., stealing, pushing, or destroying property) accidentally or

intentionally. For example, a boy “accidentally breaks a mirror when he throws a ball towards the bin where it belongs” compared to intentionally throwing the ball to break the mirror. Children base their judgments of naughtiness on intentions around five years of age, and these intention-based judgments are the first to emerge. As children age, these intention-based judgments inform their decisions of deserved punishment. In other words, young children primarily rely on the outcomes associated with the behavior when evaluating who is to blame or whether someone deserves to be punished. Around 5 to 6 years of age, children increasingly incorporate actors’ intentions into their judgments and behavior (Cushman et al., 2013). These findings are consistent with other work that indicates that older children and adult's typically base their moral judgment on both the outcomes and the intentions behind the actions, primarily when it is concerned with whether and how much to reward or punish an individual, while judgments of moral goodness or badness rely mostly on intentions (Cushman, 2008; Cushman et al., 2013; Killen & Smetana, 2008; Young et al., 2007)

Other work indicates that even children as young as 3 to 4 years old consider intentions when thinking about whether an individual deserves to be punished (Chernyak & Sobel, 2016). Children engaged in a block-tower building task with a puppet that earned them a reward of four stickers meant to be divided between the puppet and the child. The puppet either accidentally or intentionally knocked over the tower. An adult, unaware of the puppet’s motivations, punished the puppet by giving all the stickers to the child rather than splitting the reward. Children in both age groups were more likely to correct the adult's punishment (i.e., share stickers with the puppet) when the puppet's

actions were accidental rather than intentional. These results suggest that even young children consider intentions when thinking about the deservingness of a punishment.

In another study by Vaish et al., 3-year-olds watched an adult either harm or help another adult by destroying their property or helping repair the damaged property caused by the accident-prone owner of the property (2010). Children were subsequently less prosocial toward the harmful adult than a neutral adult, but children were equally prosocial towards the helpful and neutral adults. Interestingly, children were also less prosocial towards an adult who intended to harm and failed but were equally prosocial towards the neutral adult and an adult who accidentally harmed. These results suggest that children's prosocial behavior is motivated by the intentions behind another action rather than the outcome. Taken together, these studies indicate that children from a young age are making use of others' intentions when they have committed harmful acts. This informs their evaluations of moral blameworthiness, whether individuals deserve punishment, and the children's prosocial behavior towards the transgressors.

### **Moral Motivations and Prosocial Behavior**

Moral competence encompasses the evaluation of what is morally bad and wrong and what is morally good and just. However, the vast majority of studies have focused selectively on evaluations of moral violations, neglecting to investigate how people produce evaluations of actions that are generally morally approved or even admired and how moral approvals develop during childhood. While useful, most of this work concerns children's understanding of and responses to the intentions behind harmful behaviors or failed attempts at helping behavior (Cushman, 2008; Cushman et al., 2013; Margoni & Surian, 2017).



Helping and harming behaviors are sometimes conceptualized as two sides of the same coin, but there are essential differences. Numerous studies found significant asymmetries in tasks requiring the processing of helpful and harmful actions (Knobe, 2003; Young et al., 2011). For example, harmful side effects are judged as produced intentionally more often than helpful side effects, both by adults and children (Knobe, 2003; Leslie et al., 2006). Negative cues appear to have a greater weight than positive ones, even for young children and preverbal babies. Negative outcomes are much stronger cues to agency than positive outcomes (for a review, see Vaish et al., 2008). These studies suggest that judgments of praiseworthiness and blameworthiness might follow different developmental pathways.

Less is known about how children make use of intentions and incorporate them into their judgments and behavioral responses to praiseworthy actions or prosocial behavior. While scarce, there is some evidence that children use intention information when evaluating prosocial behavior. In one such study by Hamlin and colleagues, 10-month-old preverbal infants viewed puppet shows depicting two “Actors” and a “Protagonist” with an unfulfilled goal (Woo et al., 2017). The infant watched the actors either intentionally and accidentally help the protagonist achieve the goal or intentionally and accidentally “harm” the protagonist by impeding their goal. Interestingly, infants preferred intentional over accidental helpers but accidental over intentional harmers, as indicated by their desire to interact with and reach toward the character. These results suggest that infants incorporate information about others’ prosocial intentions by ten months old and make intention-based social evaluations of those who help.

Recent work explores whether intentions play a role in children's judgments of moral praiseworthiness and blameworthiness as well as how intentions influence the consequence children believe the agent deserves (i.e., punishment or reward). 4- to 8-year- children heard stories about helpful and harmful actions where either the protagonist failed to perform the intended outcome or the outcome was accidental, therefore not intended (Margoni & Surian, 2017). For example, one protagonist attempted to help retrieve a ball lost in a tree but could not knock the ball out of the tree due to sneezing (i.e., had good intentions but no consequence). Conversely, another protagonist sneezed and accidentally helped hit a ball out of a tree (i.e., good consequence without relevant intention). Children evaluated the goodness and badness of the protagonists and whether the protagonist deserved rewards or punishments for attempted and accidental help and harm. The authors found an outcome-to-intent shift consistent with previous work, where children under five initially rely on outcomes for their moral judgments of helpful behaviors. Then, around five years of age, children's evaluations of badness and punishment decisions incorporate the protagonists' intentions.

Interestingly, children's intent-based attribution of goodness seemed to develop before the intent-based attribution of badness when judging failed attempts. These studies indicate that children incorporate intention information into their understanding and judgments of others' prosocial behavior. While these studies are helpful, they rely on failed attempts to help or accidental helping, which does not fully address the complex social world humans must navigate, where individuals are more than accidentally or intentionally prosocial. Similar seeming actions could have many intentions that can underly them. These intentions provide essential and valuable information about potential

social partners, and it is crucial that research address how children use these intentions as well as apply them to their complex social world. The focus of the current dissertation is to investigate whether children are attending to others' prosocial intentions and how children use those intentions to inform the understanding of their social world.

### **Prosocial Motivations**

Identifying the intentions underlying harmful behavior helps us avoid partners who may harm us in the future, but that may not be sufficient for finding individuals who are especially likely to *help* us in the future. To achieve the latter, we must identify the intentions underlying prosocial behavior. Children's own prosocial behavior can be motivated by a variety of reasons. For example, children are naturally concerned about others and have an intrinsic desire to see others receive the help they need (Hepach et al., 2012). Within the first year, infants show concern for those in distress, and by the second year, children's concern motivates their prosocial behavior (Davidov et al., 2021; Vaish et al., 2009; Zahn-Waxler & Radke-Yarrow, 1990). By around three years of age, social emotions such as gratitude and guilt motivate children to engage prosocially through reciprocity and to repair the relationship, respectively (Vaish & Hepach, 2020). Starting at age 3, preschoolers incorporate social norms into their sense of morality and understanding of altruistic behaviors. Children may perform or approve of particular prosocial actions due to group norms or rules (Tomasello and Vaish, 2013). As children age, their prosocial behaviors become more strategic with ulterior goals such as being chosen as social partners, eliciting reciprocity, and improving their reputation (Grueneisen & Warneken, 2022). For example, children starting at five years old are more generous when observed by a peer versus unobserved in an effort to manage their

reputations (Engelmann & Rapp, 2018). These results indicate that children's prosocial behavior can be motivationally and cognitively driven for complex and varied reasons, such as concern for others, desire for reciprocity, and social rules and norms.

Understanding the intentions behind someone's prosocial actions helps individuals distinguish between self-interested versus truly generous prosocial behavior (Gul & Pesendorfer, 2016). Indeed, even when two agents' prosocial behavior appears physically identical, the agents' immediate motives may span anywhere from altruistic to egoistic (Eisenberg et al., 2016). Altruistic motivations are motivation states with the ultimate goal of benefiting others or increasing another's welfare, such as the recipient of the prosocial action (Batson et al., 2011). In contrast, the ultimate goal of egoistic motivations is to increase the welfare of the individual who is performing the prosocial action, such as an improved reputation or reciprocity from the recipient (Batson et al., 2011). These motives carry vital predictive information: When someone acts prosocially with benevolent intentions, it tells us that the person is invested in our welfare, making it highly likely that they will continue to be kind and might be a good partner in the future. On the other hand, if someone acts prosocially for self-interested reasons or with negative intentions, it is difficult to predict their future prosocial behavior, as these self-interested motivations may be fulfilled by acting prosocially towards another individual. Thus, we cannot guarantee that they will genuinely be a good partner or even act prosocially towards us in the future. This is the focus of the current dissertation, which will investigate how children evaluate the intentions underlying others' prosocial actions, how that develops over time, and whether children use these intentions to inform their predictions of and behavior towards prosocial individuals.

In sum, this dissertation aims to examine how humans identify trustworthy and reliable cooperative partners and specifically to explore when humans develop the ability to understand and incorporate prosocial intentions into their predictions, evaluations, and responses to prosocial individuals. In three studies, I investigated children's assumptions of others' intentions when individuals act prosocially and how parental values shape and inform these beliefs. This dissertation also sought to understand how children use altruistic and egoistic prosocial intentions to inform their evaluations and predictions of the prosocial individual and future prosocial behavior. Additionally, how altruistic and egoistic intentions shape children's emotions and desire to reciprocate prosocial behavior.

## **Chapter 2**

“No man giveth but with intention of good to himself (Hobbes, 2021).” Theorists like Hobbes argue that all seemingly prosocial behavior is rooted in self-interest, whether it be the preservation of our genes or the desire for rewards. Other theorists put forth that humans are capable of genuinely altruistic behavior motivated, which is behavior motivated by concern for others' welfare and a willingness to diminish the suffering of others (Hume, 2019; Rousseau & Tozer, 1998). Many scholarly disciplines, including theology, philosophy, economics, and psychology, have participated in this ever-present debate. While this is a valuable and thought-provoking discussion, little research has explored lay theories of altruistic behavior. Does the average person believe altruistic behavior is prompted by egoistic self-interest or altruistic other-oriented motives?

Even for individuals outside of academia, beliefs about what motivates an individual to be prosocial can be an essential guide for interpreting others' motives in daily life. When someone acts prosocially, frequently, their motivations are ambiguous,

and individuals use their preconceptions about prosocial motives to fill in these gaps. Those witnessing the prosocial action may view the prosocial behavior as indicative of egoistic self-oriented or altruistic other-oriented motives. For example, acting prosocially can lead to many benefits, such as a greater reputation within a group, increased reciprocity, or experiencing more positive emotions. In one recent study, when presented with prosocial scenarios with ambiguous motivations, those who believed others act out of egoistic motives were more likely to think that the reasons for a person's prosocial actions were those benefits. Meanwhile, people who believed in altruistic motives viewed the benefits as an incidental consequence, not the actor's motivation (Carlson & Zaki, 2018). This indicates that an individual's prior beliefs about prosocial behavior can shape how those individuals view and interpret someone's prosocial behavior when the motives are ambiguous. While little work has explored how children interpret someone's ambiguous prosocial motives, there is evidence for a similar phenomenon in children, whereby children's prior beliefs shape their responses to harmful actions. What's more, their early life experiences may motivate them to view ambiguous situations as hostile, a phenomenon known as hostile attributional bias (Dodge, 1980; Orobio De Castro et al., 2002).

Individuals' preconceptions about prosocial motives can influence their *own* prosocial actions (Mehl et al., 2015). Many studies suggest that adults' prosocial behavior decreases when it is extrinsically motivated, by praise or reward, rather than intrinsically motivated (Darley & Batson, 1973; J. Heyman & Ariely, 2004; Lin et al., 2017; Stukas et al., 2016; Uranowitz, 1975). Even young children are naturally inclined to be prosocial, and while parents' social scaffolding (encouragement and praise) does increase early

prosocial for young infants, these extrinsic rewards become less motivating with age, and material rewards decrease children's prosocial behavior for 20-month-old children (Dahl et al., 2017; Warneken & Tomasello, 2008). Unlike those who believe others act out of altruistic motives, those who believe egotistic motivations drive prosocial behavior are more likely to think that good deeds are extrinsically motivated and performed to achieve some other goal (Carlson & Zaki, 2018; Kruglanski et al., 2018). Moreover, these beliefs in self-interested and extrinsically motivated prosocial behavior are related to an individual's tendency to be prosocial in their daily life as well as how cooperative they are during a lab-based dictator game (Carlson & Zaki, 2018). These results suggest that one's preconceptions about prosocial motivations can shape an individual's desire to be prosocial.

An individual's preconceptions about prosocial motives can also influence how stable and dependable they believe a prosocial partner might be. For adults, when prosocial acts are thought to be more self-interested and extrinsically motivated rather than intrinsically motivated, potential social partners' actions are viewed as more conditional on those extrinsic incentives, such as reward and praise (Lepper et al., 1973). Prosocial behavior is then more "expendable" (Heider, 2005). In other words, if something else provides the same benefit, the social partner no longer needs to be prosocial. By contrast, altruistic intrinsic motives, such as the concern for others' welfare, provide cues that a social partner is stable and dependable since the prosocial acts are unconditional and "indispensable" for satisfying the social partner's goal (Batson et al., 2011; Carlson & Zaki, 2018). While lay theories about prosocial motivations

significantly affect adults' perceptions, actions, and predictions, little work has been conducted to understand what children think motivates others to act prosocially.

One way to better understand what children think motivates others' prosocial behavior is to look at what encourages children to be prosocial. Children's prosocial behavior may be driven by many motives, ranging from egoistic and self-interested to altruistic and other-oriented (for review, see Eisenberg et al., 2016). As discussed above, children exhibit genuine concern and have an intrinsic desire to see others receive the help they need (Hepach et al., 2012). Moreover, children readily show concern for those in distress, and this concern motivates children's prosocial behavior from early in development (Davidov et al., 2021; Vaish et al., 2009; Zahn-Waxler & Radke-Yarrow, 1990). Children experience complex, other-oriented emotions (e.g., sympathy, empathy, etc.), which are known to motivate children's prosocial behavior (Eisenberg et al., 2006; Kogut et al., 2016; Kogut & Kogut, 2013; Vaish et al., 2009). So, from quite early in development, children are motivated and readily demonstrate prosocial behavior for altruistic and other reasons.

Children may also be motivated to be prosocial for egoistic and self-interested purposes. Young children readily manage their reputations and will act prosocially to do so (Engelmann et al., 2013; Engelmann & Rapp, 2018). For example, 5-year-olds are more generous when observed by a peer than when allowed to donate unobserved (Engelmann & Rapp, 2018). Although the results are inconsistent, some research indicates that external rewards and praise can motivate children to be more prosocial (Hao & Du, 2021). Children can also be calculated in their prosocial behavior, such that they adjust their prosocial behavior based on the likelihood of reciprocity or to elicit



prosocial behavior from others (Kenward et al., 2015; Sebastián-Enesco & Warneken, 2015; Xiong et al., 2016). Thus, children's prosocial behavior may just as easily be compelled by egoistic and self-interested motivations as altruistic and other-oriented motives.

Children incorporate social norms into their understanding of morality and perform or approve of prosocial actions based on group norms, approval, or explicit rules (Tomasello & Vaish, 2012). Parental socialization plays a crucial role in the forms and frequency of children's prosocial behavior (for a review, see Padilla-Walker, 2014). For instance, young children are more likely to engage in both sharing and helping behaviors if they have parents who frequently ask them to explain the emotions of sharing or helping behaviors described in storybooks (Brownell, 2013). When parents encourage their children to do daily chores, they are more likely to adopt other prosocial behaviors (Waugh et al., 2015). 13-month-old infants are even motivated to help if parents give explicit positive feedback when infants act prosocially (Dahl et al., 2017). However, parental influence on children's prosocial behavior is complicated. For example, parental enforcement of prosocial behavior negatively correlates with children's compliance to a request for prosocial behavior from a peer (Eisenberg et al., 1991). Regardless of the complexity, it is evident from this work that parents play an essential role in children's prosocial behavior.

Parents also influence children's evaluations of prosocial behaviors and the approval of the intention behind those behaviors based on their own culture and personal values (Kärtner, 2018; Kärtner et al., 2010). For instance, parental values regarding justice and fairness influence children's preferences for prosocial characters who help

rather than hinder another character's goals (Cowell & Decety, 2015). Additionally, parental culture and values determine the opportunities for different types of prosocial behavior and whether the prosocial behavior is rewarded or punished. These culturally enforced values motivate children to view different types of prosocial behavior and motivations as morally good (Carra et al., 2013; Kärtner et al., 2010; Köster et al., 2016). Thus, culture and parental socialization can affect children's prosocial behavior and impact which motivations are determined to be morally good or appropriate reasons for being prosocial.

In sum, what children assume motivates others to act prosocially remains unclear. Do children presume that others act out of egoistic or altruistic motives? Given the extent to which lay theories about prosocial motives can shape an adult's perception, actions, and predictions, it is crucial to understand children's preconceptions about others' prosocial intentions. Therefore, the first aim of this study is to assess children's preconceptions and understanding of others' prosocial motivation. To evaluate these questions, children participated in a vignette study exploring children's preconceptions about others' prosocial motivations. The general procedure for the study was as follows: Two stories were read aloud to the children via Zoom. In these stories, prosocial agents help individuals achieve goals and share resources, but the agents' motivations are not stated. After hearing each story, children answered questions about the prosocial agent's motivations via open-ended and forced-choice questions. Children were also asked about the recipient's emotional response to the action. Then, children evaluated the prosocial agent's character (i.e., goodness or badness).

Given that children's *own* prosocial behavior is motivated by their concerns for others from a very early age and other-oriented altruistic motivations, like empathic concern, are greatly valued by adults; we anticipate that children will favor other-oriented altruistic motivations, such as concern for others, and believe that others' prosocial behavior is also driven by concern for those in need in both the open-ended and forced-choice motivation questions. Moreover, we hypothesize that children prefer to describe the prosocial agent as intrinsically motivated by other-oriented concerns and prosocial dispositions rather than extrinsically motivated by rewards or punishment.

A second exploratory purpose of this study is to understand how environmental factors (e.g., parental socialization and culture) might shape children's preconceptions of an agent's prosocial intention. Moreover, this study aims to understand how parents' own values may play a role in children's understanding of good reasons for prosocial behavior. Given that parent's socialization goals, such as valuing helping others or equality, affect the frequency of children's prosocial behavior (Kärtner et al., 2010), we hypothesize that how parents think about, interpret, and teach their children about others' prosocial behaviors will relate to children's responses.

## **Method**

### **Participants**

The study and planned analyses were preregistered using the Open Science Framework (<https://osf.io/pd6q5>). The planned sample size was determined based on a power analysis in R using an effect size of 0.36, a power of 0.8, and an alpha of 0.05 (based on Margoni & Surian, 2017). The power analysis determined that a sample size of 61 was required, but given the counterbalancing of the three age groups and four

presentation orders included in this study, the planned sample size was set at  $N = 72$  children between 4 to 9 years of age. The final sample consisted of 72 children (36 girls and 36 boys) between 49 months and 119 months ( $M = 75.50$  months,  $SD = 20.86$  months) from across the United States, recruited on Facebook. Most participant families were recruited from the southern region of the United States (South = 47.2%, West = 22.2%, Midwest = 19.4%, and Northeast = 11.1%). The sample was predominantly middle class and White (White = 62.5%, Asian = 8.33%, Hispanic = 6.94%, African American = 4.17%, more than one race = 18.1%). Eleven additional participants were excluded from the analysis: 9 failed the character evaluation training, 1 participant did not pass the comprehension checks about the stories, and 1 participant's parent interfered in the study procedure. Families received a 10-dollar gift card for participation in the study.

### **Setting**

The study was conducted synchronously online via Zoom. Child prosocial vignette stories were presented on Qualtrics, where the researchers documented all child responses. The researchers used Zoom to record and transcribe all parent videos, which were used to quantify the data.

Before the study appointment, parents were asked to complete an 8-item questionnaire to report the frequency with which the parents and children engaged in various discussions and socialization of prosocial behavior topics (e.g., showing gratitude, reciprocity, their emotions after receiving a favor; see Appendix A for Prosocial Socialization Questionnaire). Parents also completed a modified Kärtner Socialization Goals Questionnaire (Kärtner et al., 2010) on a 5-point Likert scale, which

describes the parent's cultural values. This questionnaire contains 23 items related to 6 moral values (autonomy fairness, autonomy care, community loyalty, community respect, divinity purity, and moral understanding). Primary caregivers indicate how important each item is to their children's socialization (see Appendix B). Since this study focuses on children's interpretation of others' prosocial behavior intentions, 13 out of 23 items were chosen from the questionnaire. The four items in the *autonomy fairness* subcategory concern the moral values of honesty, sharing, and fairness. The four questions related to *autonomy care* measures moral values associated with helping, caring, comforting, and not hurting others. *Community loyalty* contains two items that characterize moral values related to the child's responsibility within a group and feeling affiliated to a group. The two items in *community respect* focus on obedience to teachers and respect for other children. Lastly, *moral understanding* has one item that considers the ability to distinguish between the good and the bad. The *Divinity Purity* items were not included in the study as they were not closely related to the focus of the study.

## **Procedure**

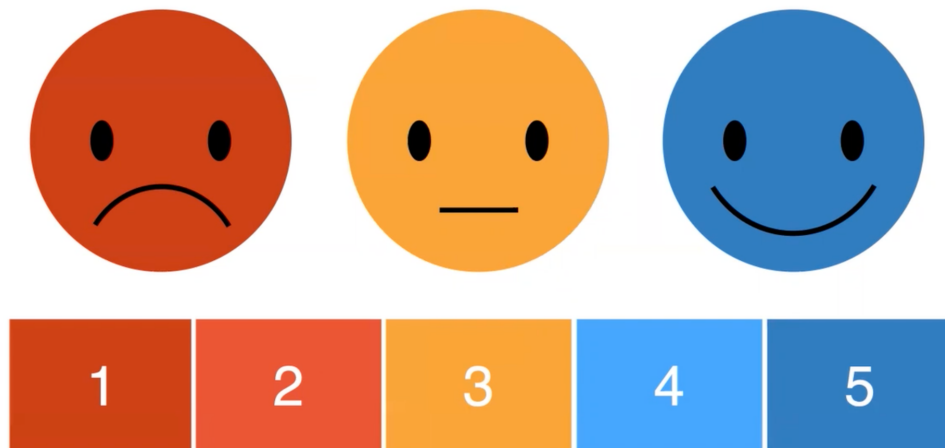
### ***Character Evaluation Scale***

After a brief introduction and warm-up with the child via Zoom, the researcher shared her computer screen so that the child would be able to watch the animations. First, the child watched a training video about using a 5-point character evaluation scale, which consisted of a series of smiling and frowning faces (see Figure 1). The scale ranged from 1 to 5 and was accompanied by verbal character evaluations (really, really bad, a little bad, just okay, a little good, really, really good). After watching the training video, the child pointed and verbalized the locations of all the character evaluations as a

comprehension check (e.g., “Where would you point if something is a little bad?”). All five points on the character evaluation scale were probed. The question was repeated if the child failed to provide an answer or answered the question incorrectly. If the child still did not answer or answered incorrectly, they were removed from the analyses.

**Figure 1**

A Series of Smiling and Frowning Faces Were Used in Evaluating the Prosocial Agent



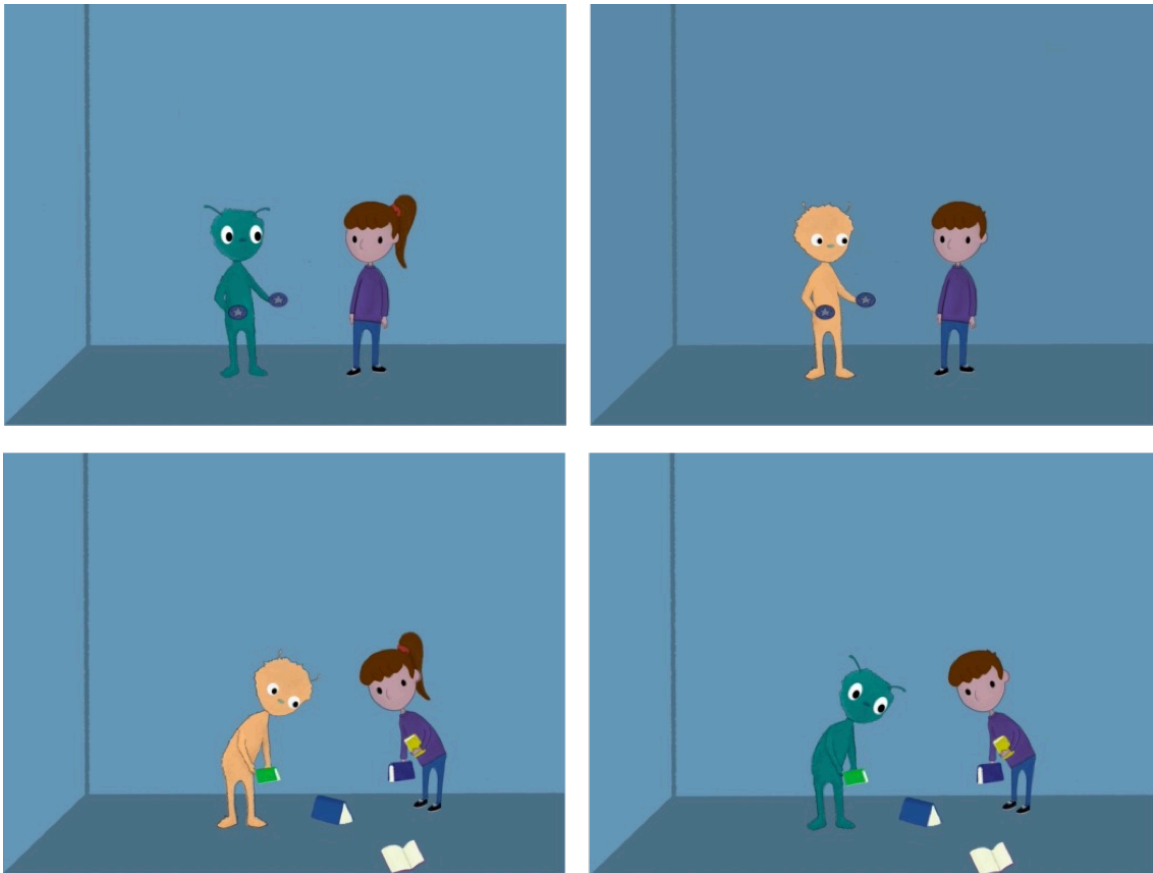
### *Prosocial Stories*

Following the Character Evaluation Scale training, the child watched videos that presented two prosocial stories in a storybook format. The two stories were read aloud to the child, accompanied by drawings depicting the relevant scenes. In these stories, prosocial agents (Yellow and Green) help the recipient achieve a goal (i.e., picking up books that the recipient dropped) and share resources (a sticker) with the recipient (see Appendix C for the Prosocial Stories). The same person recorded all stories with the same tone of voice to ensure consistency across presentations.

The characters in the stories were gender-matched to the participant child's chosen gender, which was asked at the beginning of the study. The female recipient was named Louisa, and the male recipient was called Louis (gender-matched to the child). The presentation order for the type of story (helping or sharing) and the character performing the prosocial behavior was counterbalanced such that if Yellow was shown helping, Green was shown sharing (Figure 2). To prevent color and order preferences, we counterbalanced across children which agent helped versus shared and which story (helping or sharing) was presented first. The prosocial agents were drawn as non-human figures to limit potential existing biases.

## Figure 2

*Example Visuals that Accompanied the Prosocial Story*



After each story, the experimenter asked the child, “What did Green/Yellow do?” to ensure the child’s understanding of the story. The question was repeated if the child failed to provide an answer or answered the question incorrectly. If the child still did not answer or answered incorrectly, they were removed from the analyses.

***Open-Ended Prosocial Motivation Question***

Next, the child responded to an open-ended question about the prosocial agent’s motivations behind their prosocial behavior. For example, when Green saw that Louisa dropped all her books, the experimenter asked, “Why did Green decide to pick up the books?” If the child did not provide an answer, the experimenter prompted the child by saying, “There is no right or wrong answer,” and the question was repeated. If the child still did not provide, no answer was entered, and the study proceeded.

***Forced-choice Prosocial Motivation Question***

The experimenter then asked the child to select a motivation for the prosocial agent’s behavior from three forced-choice options. The three options were meant to reference three primary motivations for prosocial behavior, followed by the question “Why do you think that [the prosocial agent] picked up the books for Louisa?” or “Why do you think that [the prosocial agent] gave a sticker to Louisa?”:

1. “Because she was taught to help people like Louisa” (Principles and Norms)
2. “Because she cares about Louisa” (Altruism)
3. “Because she wants something later from Louisa” (Egoistic)

In addition, the child could choose a “Something else” option and provide another motivation that was not one of the forced-choice options. The order of the first three



primary motivations was counterbalanced across children, whereas “something else” was always mentioned last.

***Character Evaluation Question***

Following the motivation questions, the experimenter asked, “How bad or good is Green?” The child rated the prosocial agent on the 5-point Likert scale. After the child provided a rating, the experimenter asked a justification question, e.g., “Why do you think Green is really, really good?”

***Exploratory Question: Recipient Behavior***

In order to understand what children thought was an appropriate response to another’s prosocial behavior, the experimenter asked the child a series of questions about her expectation of the recipient’s behavior after she listened to the first story. First, the experimenter asked the child whether the recipient should do anything, e.g., “Should Louisa do anything after Green picked up the books for her?” If the child said yes, the experimenter asked for a justification, e.g., “Why should Louisa do something after Green picked up the books for her?” Next, the experimenter asked the child to specify what the recipient should do, e.g., “What should Louisa do after Green picked up the books for her?” If the child initially responded that the recipient should not do anything, the experimenter again asked for a justification, “Why shouldn’t Louisa do something after Green picked up the books for her?”

***Exploratory Questions: Principles and Norms***

In adults, control of one’s own actions, rather than being motivated by norms or an authority figure, leads to different evaluations of moral responsibility, rewards and punishments, and evaluations (Biro & Leslie, 2007; Phillips & Shaw, 2015) . Given that

children’s prosocial behavior may be motivated by social norms or an authority figure like a parent or a teacher, an exploratory measure was included to investigate children’s reasoning about principles and norms as prosocial motivation. The experimenter asked children a series of exploratory questions about the agent in the second story. First, the experimenter told the child to imagine the prosocial agent’s parents had told the agent to help or share with the recipient. Then the experimenter asked the child to re-evaluate the prosocial agent using the five-point character evaluation scale, e.g., “How good or bad do you think Green would be then?” Finally, the child was asked to justify their character evaluation.

### ***Coding & Reliability***

The primary coder (a research assistant) used the video recording of the participants to code whether children responded correctly to the comprehension questions and open-ended prosocial motivation questions. Children’s responses to the open-ended prosocial motivation question were categorized into themes based on Eisenberg’s heuristic model of prosocial motivations (Eisenberg et al., 2016). Children’s responses were coded into the following categories:

1. *Affective Empathy* - referenced prosocial agent’s emotional response to the recipient (“Green felt sad for Louisa because she didn’t have any [stickers]”)
2. *Cognitive Empathy* - referenced prosocial agent reasoning about how they would feel in the recipient’s place (“Green would want Louis to help him if he needed it”)
3. *Recipient Emotion* – referenced the recipient’s emotional state (“Louisa was sad”)

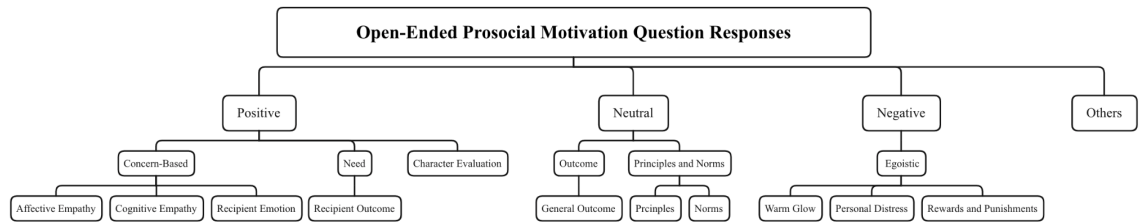
4. *Recipient Outcome* – referenced outcome for the recipient (“Louisa has all her books”)
5. *General Outcome* – referenced physical outcome of the action (“Green wanted to help Louis”)
6. *Morals & Principles* - referenced the value of the action (“It was nice to share” or “it would be bad if Louisa did not have any [stickers]”)
7. *Norms* – referenced rules or what one ought to do (“Green should pick up the books for Louisa.”)
8. *Warm Glow* – referenced the prosocial agents’ positive affect in response to their own prosocial behavior (e.g., “Yellow likes to help.”)
9. *Personal Distress* – referenced the prosocial agent’s negative affect in response to the recipient’s need (e.g., “Green was very anxious seeing Louisa dropping the book.”)
10. *Rewards and Punishments*- referenced the prosocial agent’s desire for rewards or avoidance of punishment (e.g., “Green wanted to be praised.”)
11. *Character Evaluation* – referenced the prosocial agent’s good character or moral traits (“Green is nice.”)

All remaining responses were categorized as *Other*, including children’s own preference for a given character, unintelligible speech, irrelevant responses, or did not respond. A second coder also coded the open-ended prosocial motivation question responses from the transcripts. Reliability was almost perfect for all responses (*Fleiss’ kappa* = .95).

The themes were placed in 1 of 6 categories: *Egoistic*, *Outcome*, *Need*, *Principles and Norms*, *Concern-based*, and *Character Evaluation* (Figure 3). Responses were coded

as *Egoistic* when children's answers referenced the agent's concern for themselves, the agent's internal state, desire for rewards, or avoidance of punishment (Warm Glow, Personal Distress, and Rewards and Punishments). Responses were coded under *Outcome* when they were focused on the general physical qualities or outcome of the prosocial action (General Outcome). When children's responses were focused on the need for help or the recipient's lack of resources, they were placed in the *Need* category (Recipient Outcome). Responses referencing moral values, norms, and rules were coded as focused on *Principles and Norms* (Morals & Principles and Norms). Responses were coded as *Concern-based* if they were focused on the recipient's emotional state or referenced physical harm or caring (Affective empathy, Cognitive empathy, and Recipient Emotions). Finally, if children talked about the characteristics of the prosocial agent, their answers were coded under *Character Evaluation* (Character Evaluation). If the child provided more than one answer, we coded the answers separately but only used the first one for analysis. However, if the first response was "I don't know," we chose the second response for analysis. The primary coder further categorized the six categories of children's responses to the open-ended questions into one of three valence-based categories as follows (Figure 3):

1. *Positive* – Concern-based, Need, and Character Evaluations
2. *Neutral* – Outcomes and Principles & Norms
3. *Negative* – Egoistic

**Figure 3***Coding Categories for Open-ended Prosocial Motivation Question Responses*

The primary coder also used the video recording of the participants to code children’s responses to forced-choice test questions. In the forced-choice test questions, children could select from three predetermined options or provide their own answer by selecting “something else.” Based on children’s responses, the primary coder placed the “something else” responses into two categories: *Something else*, which referenced children’s preference for a given character or irrelevant responses, or *Something else (Need)*, which referenced the need of the recipient. A second coder coded children’s “something else” responses from the transcripts. Reliability was perfect for all responses (*Fleiss’ kappa* = 1.00).

## Results

Since preliminary analyses showed no gender effects, gender was not included in further analyses. All reported *p*-values are two-tailed.

### Prosocial Motivation

#### *Open-Ended Prosocial Motivation*

We begin by providing descriptive information about children’s responses to the open-ended prosocial motivation question. When asked about the prosocial agent’s helping behavior, the largest set of children referenced character evaluations (40.3%),

stating that the prosocial agent's decision to help was motivated by the prosocial agent's character. The children's remaining responses referenced many potential motivations, including principles and norms (15.3%), outcome (12.5%), need (13.9%), concern-based (5.56%), or egoistic (2.78%) (Figure 4). When asked about the sharing scenario, the largest group of children focused on the recipient's needs (38.9%). Children also referenced the character of the prosocial agent (19.4%) and the agent's concern for the recipient (18.1%) (Figure 5).

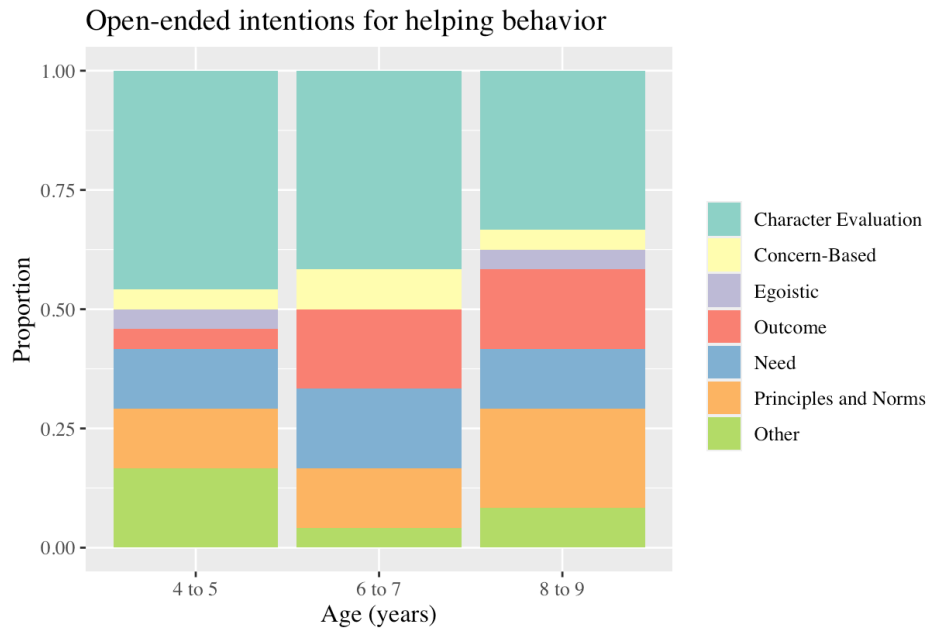
When children's responses were grouped into the valence-based categories of *Positive*, *Neutral*, and *Negative*, most children endorsed that the helpful agent had positive motives (59.7%). In contrast, other children stated that the helpful agent was motivated by more neutral motivations such as principles and norms (27.8%). The remaining children thought that the helpful agent acted out of negative or egoistic motives (2.78%) or failed to provide a relevant response after the helping scenario (9.72%) (see Appendix D). Although the distributions of responses for the valence-based categories were similar for the two behaviors, more children (76.4%, a 16.7% increase) believed the motivation was positive in the sharing than in the helping situation. The remaining children believed the sharing agent was motivated by neutral (15.3%) or negative intentions (4.17%) or did not provide a response (4.17%; see Appendix F).

Kruskal Wallis test was conducted to determine if there was a difference across the three age groups in the prosocial motivations endorsed by children. There was not a significant difference across age groups in children's valence-based responses (positive, neutral, and negative) in either the helping ( $\chi^2(1, N = 72) = 5.50, p = .481$ ) or the sharing situation ( $\chi^2(1, N = 72) = 4.76, p = .575$ ).

**Figure 4**

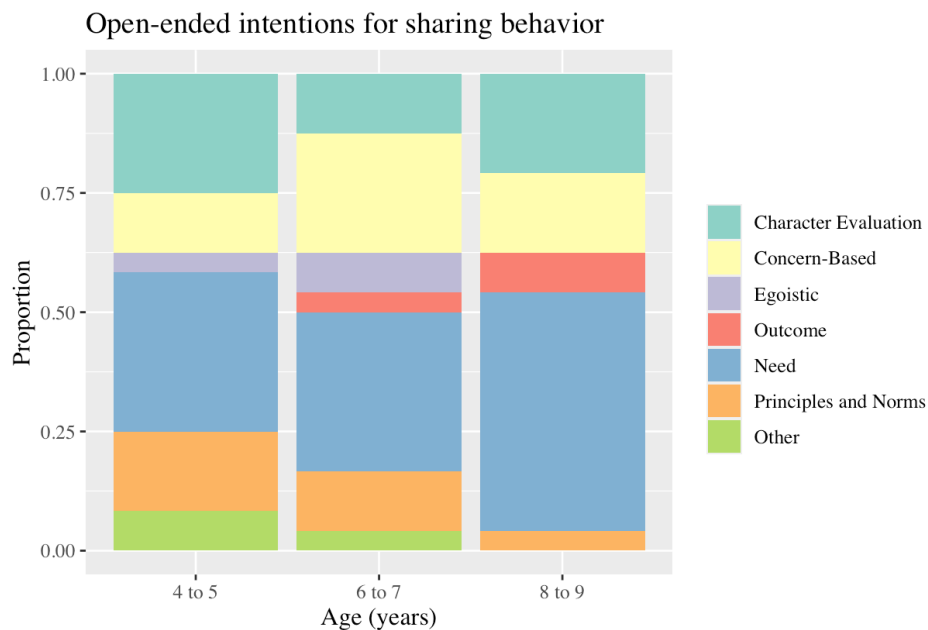
*The Proportions of Children's Responses During the Open-ended Prosocial Motivation*

*Question Following the Helping Prosocial Story*

**Figure 5**

*The Proportions of Children's Responses During the Open-ended Prosocial Motivation*

*Question Following the Sharing Prosocial Story*



### ***Forced-choice Prosocial Motivation***

When asked to choose between the forced-choice prosocial motivations, most children said that, in the helping scenario, the prosocial agent helped the recipient because he/she cared about them (55.6%). The remaining children either said the prosocial agent helped because he was taught to do so (13.9%) because he wanted something in return (4.17%), or “something else” (26.4%). Children’s responses to “something else” were coded as either based on the need of the recipient (4.17%, “Louis dropped something, so Yellow wanted to help.”) or irrelevant (22.2%, e.g., “because it could be anything”) (Figure 6).

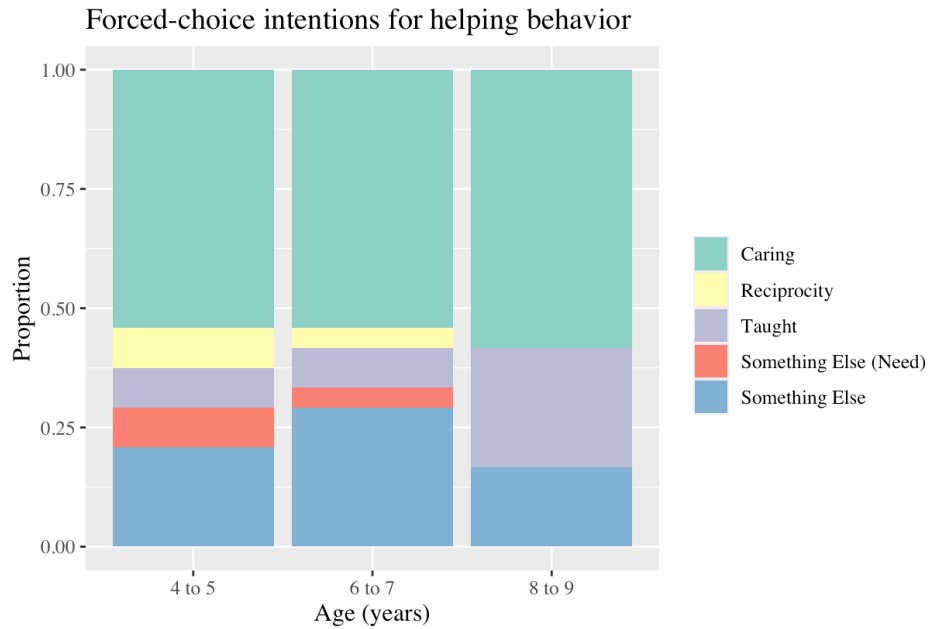
Similarly, in the sharing scenario, most children selected that the prosocial agent shared a sticker because he cared about the recipient (58.3%). The remainder of the children said the prosocial agent shared that because he was taught to do so (8.33%), he wanted something in return (5.56%), or because of the recipient’s need (8.33%), and 19.4% provided irrelevant explanations (Figure 7).

Overall, children seemed to believe that the prosocial agent acted prosocially because they cared about others. Kruskal-Wallis tests were conducted to determine if children’s responses varied across age groups. However, there was no significant difference across age groups in children’s selections in either the helping or sharing situations (both  $ps > .159$ ).

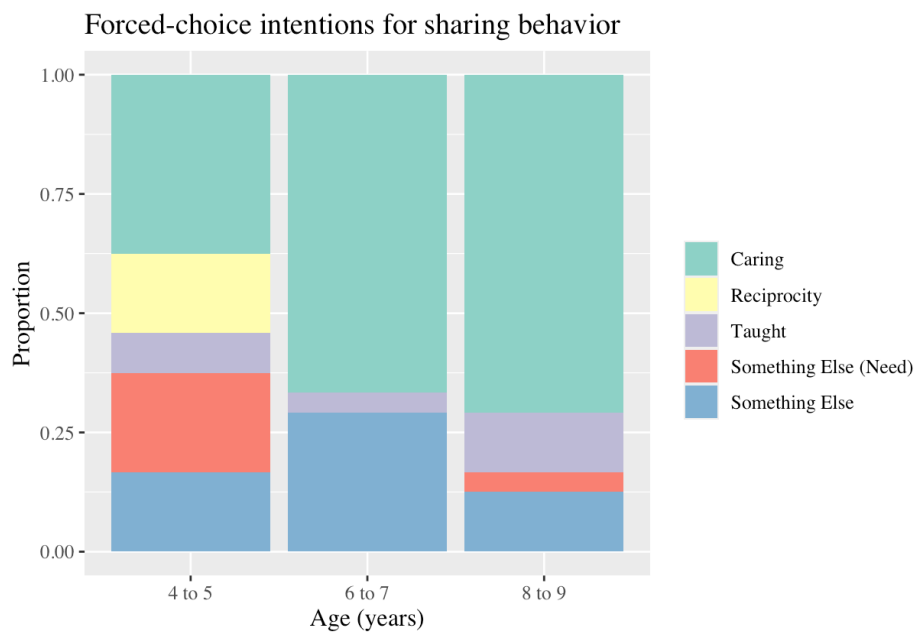


**Figure 6**

*The Proportions of Children's Responses During the Forced-choice Prosocial Motivation Question Following the Helping Prosocial Story*

**Figure 7**

*The Proportions of Children's Responses During the Forced-choice Prosocial Motivation Question Following the Sharing Prosocial Story*



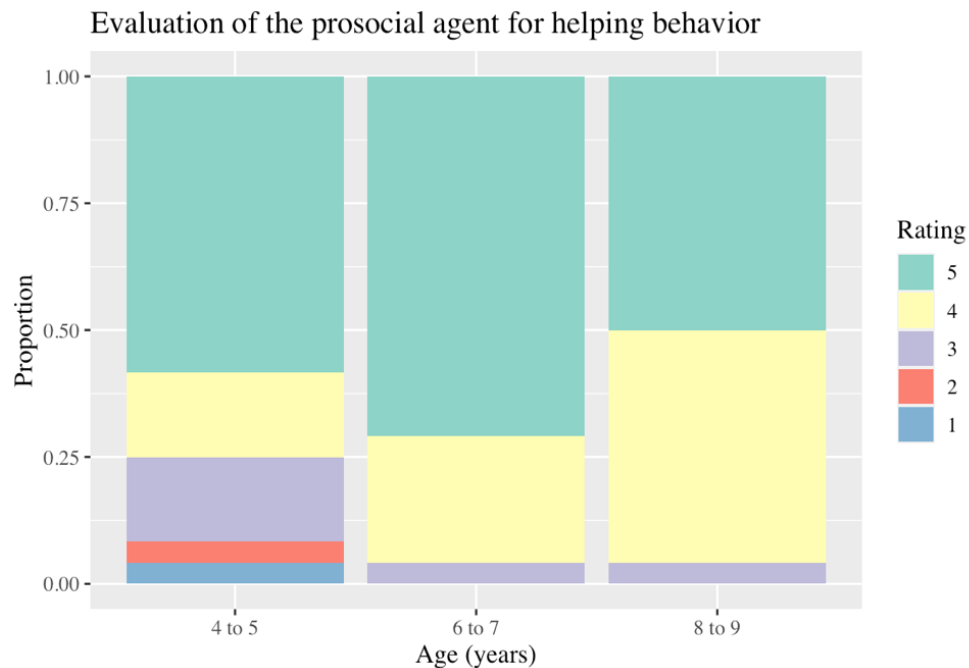
### Character Evaluation Question

When evaluating the helpful agent, a majority of the children rated the prosocial agent highly, with most children either rating the prosocial agent as “really really good” (59.7%) or “a little good” (29.2%) (Figure 8). In the sharing situation, all children rated the prosocial agent as “really really good” (54.2%), “a little good” (31.9%), or “just okay” (13.9%) (Figure 9). A Kruskal Wallis test was conducted to determine if children’s responses varied by age. For both scenarios, there was no significant difference in the level of evaluation based on children’s age (both  $ps > .170$ ).

### Figure 8

*The Proportions of Children’s Responses During the Character Evaluation Question*

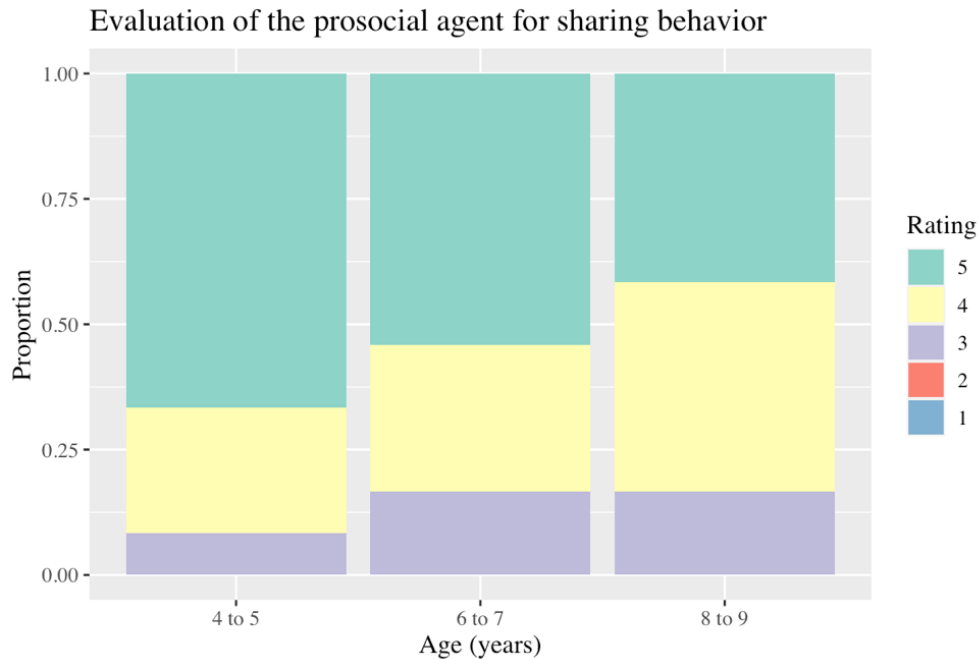
*Following the Helping Prosocial Story*



**Figure 9**

*The Proportions of Children's Responses During the Character Evaluation Question*

*Following the Sharing Prosocial Story*



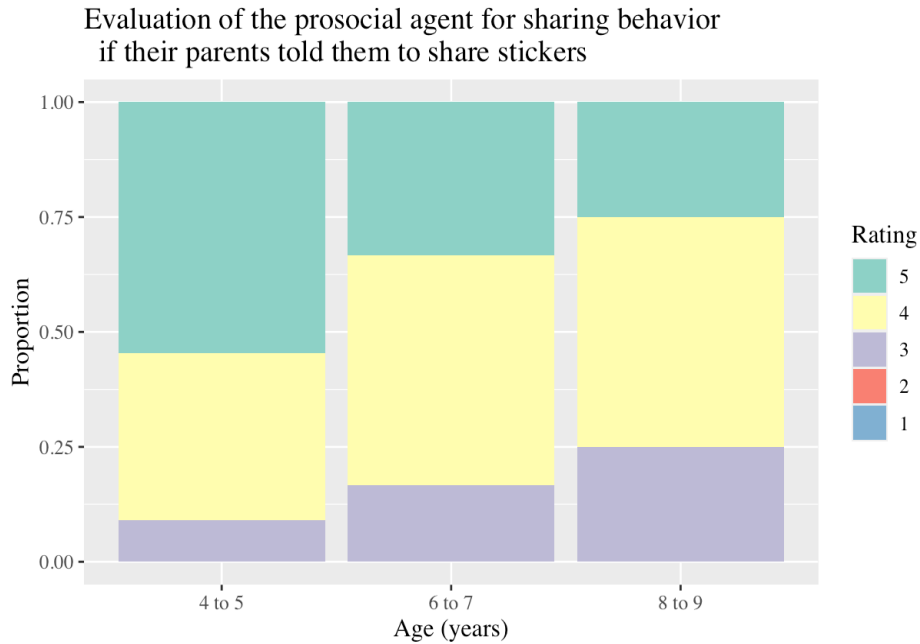
### **Exploratory Questions: Principles and Norms**

When children were asked to consider that the prosocial agent's parents had told him/her to help or share, the majority of children continued to rate the prosocial agent as "really really good" (48.6%), "a little good" (24.3%), or "just okay" (18.9%) in the helping behavior (Figure 10). For the sharing behavior, children also continued to rate the prosocial agent highly, with children thinking the prosocial agent was "really really good" (28.6%) or "a little good" (28.6%), and some thinking she was "just okay" (22.9%) (Figure 11). However, children's evaluations were less positive with the parental mandate than without: A Wilcoxon rank-sum test showed significant differences between the two evaluations in the helping story ( $W = 843.5, p = .054, d = 0.25$ ) and in the sharing story ( $W = 776, p = .044, d = 0.26$ ). The average rating was lower in the parent mandate scenario (Helping:  $M = 4.14, SD = 1.00$ ; Sharing:  $M = 3.65, SD = 1.11$ ), where the

prosocial agent was told to help by her parents, compared to when children generated their own motivations (Helping:  $M = 4.54$ ,  $SD = 0.84$ ; Sharing:  $M = 4.20$ ,  $SD = 0.72$ ).

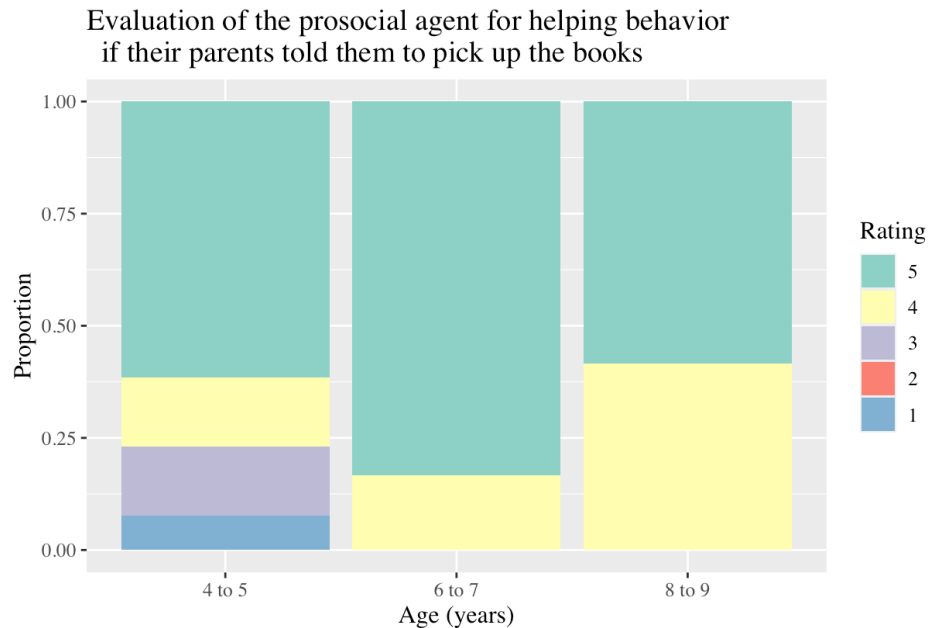
**Figure 10**

*The Proportions of Children's Responses During the Character Evaluation Question with the not Self-motivated Information Following the Helping Prosocial Story*



**Figure 11**

*The Proportions of Children's Responses During the Character Evaluation Question with the not Self-motivated Information Following the Sharing Prosocial Story*



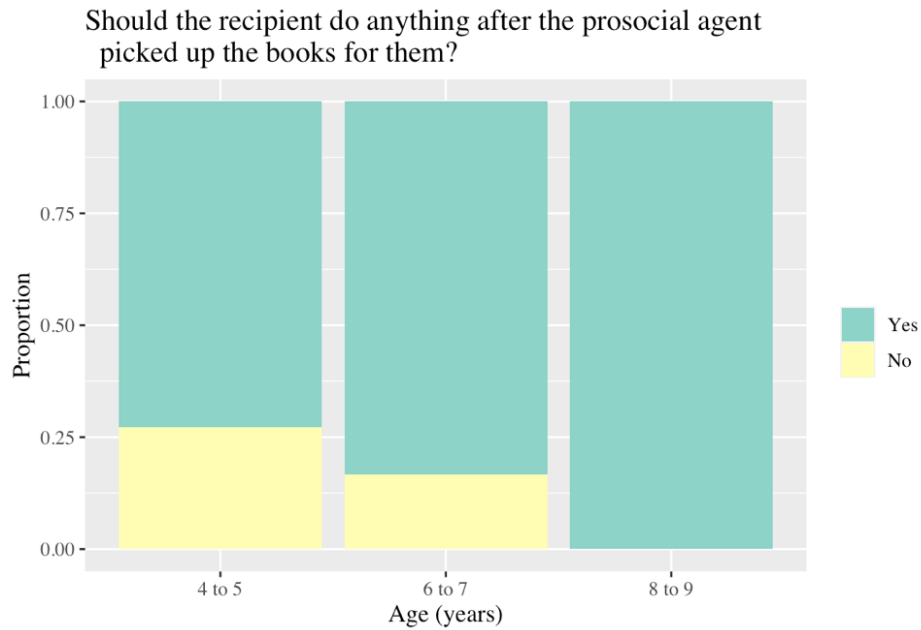
### Recipient Behavior

When children were asked if the recipient should “do anything” after the prosocial agent either helped or shared, a majority of the children in both the helping scenario (85.7%) (Figure 12) and the sharing scenario (83.8%) (Figure 13) believed the recipient should do something in response. Most children who answered “yes,” said that the recipient should respond with culturally appropriate displays such as saying “thank you” (86.81%), and some said the recipient should respond with a similar prosocial behavior (10.89%). Kruskal Wallis tests comparing children’s responses across age groups were not significant for the helping or sharing situation (both  $ps > .168$ ), indicating that children held similar beliefs about recipient behavior across ages.

**Figure 12**

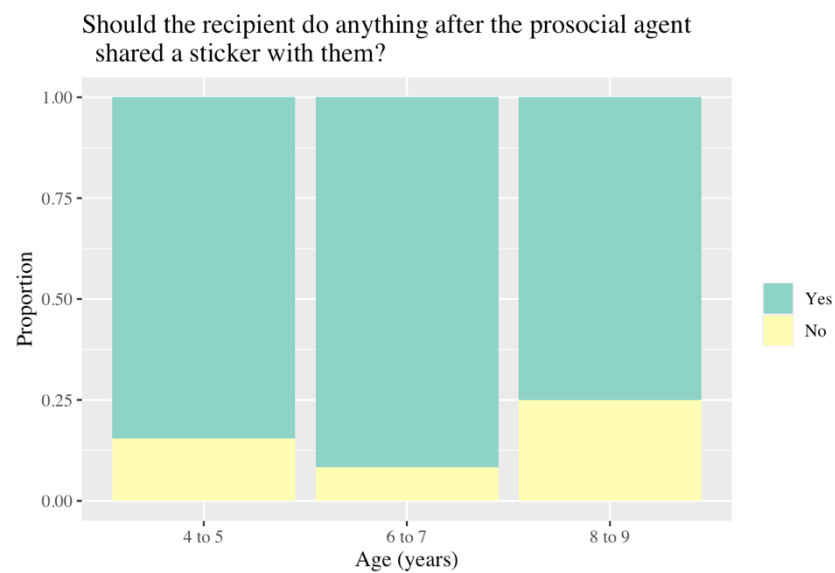
*The Proportions of Children's Responses During the Recipient Behavior Question*

*Following the Helping Prosocial Story*

**Figure 13**

*The Proportions of Children's Responses During the Recipient Behavior Question*

*Following the Sharing Prosocial Story*



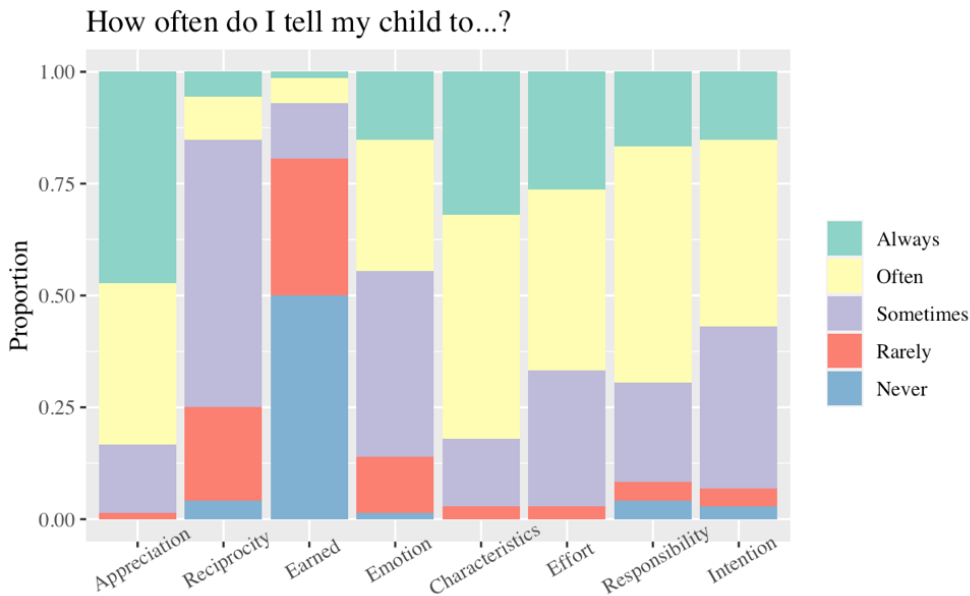
**Parent Questionnaire**

***Prosocial Socialization Questionnaire***

The prosocial socialization questionnaire contains eight items related to how parents talk about prosocial behaviors to children. None of the eight items were correlated to children’s age. For appreciation, characteristics, effort, responsibility, and intention, more than 51.4% of parents always (> 15.3%) or often (> 36.1%) mentioned those five themes to their children. Parents also indicated that they always (15.2%) or often (29.1%) talked about their children’s emotions after they received a favor. However, only 15.3% of parents always (5.56%) or often (9.72%) discussed reciprocity, and 50.0% never talked about whether their children earned the favor or not (Figure 14). All Kruskal Wallis tests between the items and children’s age were non-significant (all *ps* > .159).

**Figure 14**

*The Proportions of parents’ Responses in the Prosocial Socialization Questionnaire*



### *Kärtner Socialization Goals Questionnaire*

We created descriptive statistics for the five moral values (autonomy care, autonomy fairness, community loyalty, community respect, and moral understanding) and also calculated scores for the Kärtner Socialization Goals Questionnaire, where five represented “extremely important,” and 1 indicated “not important at all.” Since autonomy care and autonomy fairness contained four items, the highest possible score for each was 20, and the lowest possible score was 4. Both community loyalty and community respect included two items, so the score range for each was 2 to 10. Moral understanding had 1 item so that the scores could range from 1 to 5. In addition, we also dummy-coded children’s forced-choice responses (caring, reciprocity, taught, something else - need, and something else). Binary logistic regressions were conducted for all scores with the forced-choice responses.

Among the five moral values, parents believed it was “extremely important” (75.0%) and “very important” (22.2%) to teach children moral understanding (Figure 15; see Appendix F for the distribution of each item in each moral value). Moral understanding was not correlated with any of the forced-choice responses (all  $ps > .075$ ).

Regarding autonomy care, parents also emphasized it as “extremely important” (50.7%), “very important” (32.3%), and “moderately important” (13.5%). The score of autonomy care was significantly associated with children’s choices of whether the prosocial agent shared because they were taught to do so, such that parents who scored autonomy care as more important had children who were more likely to say the prosocial agent shared because they were taught to do so ( $B = 0.552$ ,  $SE = 0.267$ ,  $p = .039$ ). All other responses were not significantly related to autonomy care (all  $ps > .331$ ).

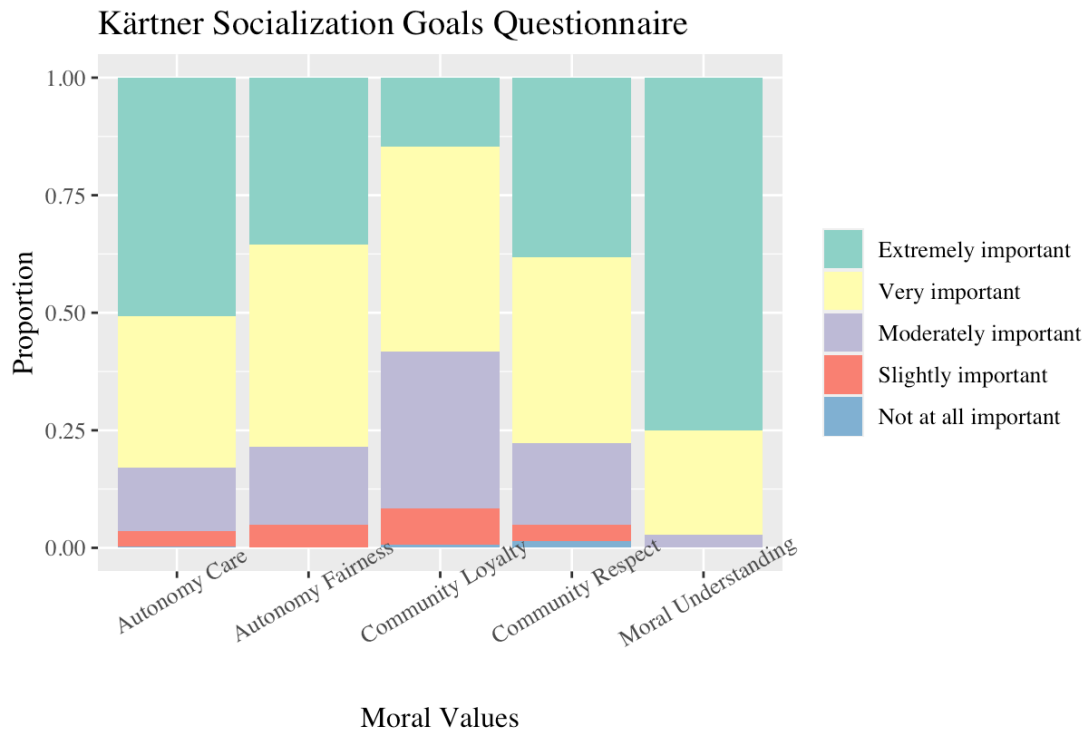


All parents believed that autonomy fairness was important as a socialization goal but with different degrees of importance (“extremely important” 35.4%, “very important” 43.1%, and “moderately important” 16.7%). All choices in the forced-choice prosocial motivation questions were not associated with parental values of autonomy fairness (all  $ps > .053$ ). Comparably, parents valued community respect in a similar pattern, such that they said it was “extremely important” (38.2%), “very important” (39.6%), and “moderately important” (17.4%). All answers for the forced-choice questions were not significantly correlated with community respect score (all  $ps > .217$ ).

However, only 14.6% of parents rated community loyalty as “extremely important.” Most parents rated community loyalty as “very important” (43.8%) and “moderately important” (33.3%). 8.33% of parents addressed community loyalty as “slightly important” or “not at all important.” There was a significant association between parents’ values of community loyalty and the selection made by children during the forced-choice questions about helping motivations. More specifically, parents who valued community loyalty had children who were more likely to say the prosocial agent helped because they cared about the recipient ( $B = 0.520$ ,  $SE = 0.211$ ,  $p = .014$ ). There were no other associations between parents’ values of community loyalty and children’s choices of the forced-choice questions (all  $ps > .133$ ).

**Figure 15**

*The Proportions of Parents' Responses in the Kärntner Socialization Goals Questionnaire*



### **Discussion**

The primary aim of this study was to assess children's preconceptions and understanding of others' prosocial motivation. As an exploratory second aim, this study sought to understand how environmental factors (e.g., parental socialization and culture) might help shape these preconceptions. The current study begins to demonstrate that by the preschool to early school years, children can already reason about the intentions behind another's prosocial actions. Like children's own prosocial motivations, children believe there are many reasons why others may act prosocially (Eisenberg et al., 2016). The results of the present study also indicate that children, at least in the population that we sampled, believe that others' prosocial behavior is primarily driven by altruistic motives or the intrinsic qualities of a positive disposition. When asked to choose from a

series of predetermined prosocial motivations or generate their own, most children believed the prosocial agents acted out of altruistic and other-oriented motives rather than egoistic and self-interested motives.

The current study adds to the literature about parental socialization of prosocial behavior, which demonstrates that parents' communication about emotions and other-oriented concerns appears to influence children's emotional reactions and style of prosocial behavior (Miller et al., 1991; Eisenberg, 2003; Hastings et al., 2007) The results of the current study extend the work by Eisenberg and others showing that parental care- and concern-based values and socialization are associated with not only their children's prosocial behavior but also how their children interpreted the prosocial agent's motivations. As assessed by the Kärtner socialization goals questionnaire, the parents in this study sample stressed the importance of children learning the values of caring for others, loyalty to their community, and understanding the difference between right and wrong. Moreover, parents who placed high importance on children learning about the value of caring for others had children who were more likely to interpret the agent's prosocial behavior as motivated by caring for the recipient or the recipient's needs in the sharing scenarios. Parents who rated community loyalty as a valuable socialization goal were more likely to have children who thought the helping behavior was motivated by caring for the recipient. These results suggest that parents' values and socialization practices are associated with – and may influence – children's perspectives of prosocial behavior.

The current study begins to demonstrate that children's lay theories about others' prosocial intentions may be more in line with Hume and Rousseau than Hobbes, such that

children believe people act out of other-oriented altruistic motives rather than out of egoistic self-serving motives. The results of the present study indicate that children, at least in the population that we sampled, believe that others' prosocial behavior is primarily driven by positive motives, such as concern for the recipient or a positive disposition. Moreover, the results of this study align with work about children's *own* prosocial motivations which argues that care-based motivations (e.g., empathy, sympathy, etc.) are the primary motivators behind children's prosocial behavior (Eisenberg et al., 1991, 2006). Thus, it is unsurprising that care-based motivations and a focus on the recipient's need were among the most prominent themes children used when interpreting others' prosocial actions. As discussed above, adults' preconceptions about others' prosocial motives inform their prosocial behavior (Carlson & Zaki, 2018). Given the overlap between children's beliefs about others' prosocial motives and children's prosocial behavior, future work should explore how these concepts inform and shape each other.

In addition to care-based motivations, children described the prosocial behavior as motivated by the prosocial agent's good character and disposition when asked to provide their reasons for the agent's actions. Adults who believe in altruistic prosocial motives are more likely to think the prosocial behavior is intrinsically motivated, and thus, the social partner is more stable and dependable over time (Batson, 2011; Carlson & Zaki, 2018). Similarly, preschool-aged children consider sociomoral character traits, such as niceness, to be stable over time and more helpful in predicting future behavior than behavioral characteristics, even if the traits and behavior conflict (Diesendruck & Lindenbaum, 2009; G. D. Heyman & Gelman, 2000). Children also use the character trait

labels of “mean” and “nice” to generalize and make mental state inferences, such as whether the character will have a more negative affect if someone is upset by their actions (G. D. Heyman & Gelman, 2000). Children’s predilection in this study to assume sociomoral character traits (niceness or goodness) as motivators for prosocial behavior aligns with this work and may indicate that the children believe a prosocial agent’s behavior to be intrinsically motivated and thus more stable over time.

Interestingly in an exploratory question, when the prosocial agent’s parents told him/her to act prosocially, children across all age groups rated the prosocial agent as less good than when they generated their own ideas about the agent’s motivations. The finding that parental instruction impacts children’s evaluations of the prosocial agent character suggests that children may be incorporating subtle intention information into their reasoning about an individual who acts prosocially. Control of one’s actions suggests that the action is goal-directed and intentionally performed by the agent (Verschoor et al., 2010). Furthermore, the responsiveness of children’s evaluations to autonomy cues is consistent with work on moral blame and intervening third parties in adults, which revealed that individuals were considered less blameworthy and responsible for the negative outcomes of a moral violation if a third party instigated the causal chain (Phillips & Shaw, 2015). Thus, children’s reliance on free will or autonomy information in their evaluations indicates that children may be using this subtle information to make inferences about the intentionality of the prosocial agent’s actions, as well as the agent’s character and, by association, future behavior. It is essential then that children’s understanding, preconceptions, and use of autonomy information in their appraisals of prosocial behavior should be explored in future studies.

While the findings may not be surprising that children believe that altruistic motives drive prosocial behavior, they are essential as they provide context and a deeper understanding of how these preconceptions can shape children's perceptions and responses to their social world. For example, these findings may provide insight into the negativity bias seen in children and adults (Baumeister et al., 2001; Ito et al., 1998; Vaish et al., 2008). Humans are biased toward negative social information and behavior, where negative cues appear to have a greater weight than positive ones (for a review, see Vaish et al., 2008). For example, negative outcomes are judged as more intentional and provide much stronger agency cues than positive outcomes, both by adults and children (Knobe, 2003; Leslie et al., 2006; Young et al., 2011). Since young children seem to assume others act out of good intentions, children should not be surprised and should pay less attention when someone demonstrates positive behavior, as it is consistent with their predictions. However, their prediction of a positive-intentioned individual is violated if someone harms others or shows negative intentions. The current study then provides some further explanation for the negativity bias in human cognition and how this psychological phenomenon may be related to children's anticipation of others to be good and kind.

It is important to note that while our study sample was regionally diverse, most participants shared similar value systems. For example, most parents in the current sample rated community loyalty and community respect as less important than the other value categories. On the other hand, different cultural groups, such as collectivist societies, may emphasize these values, which may influence parents' socialization of prosocial behavior (Kärtner, 2018). Collectivist societies also experience more

indebtedness and a desire to reciprocate a favor when they are the recipient of another's prosocial action (Hitokoto, 2016; Oishi et al., 2019; Shin et al., 2020). Furthermore, parents may differ in their socialization of behavior associated with responding to prosocial behavior. For example, mothers from Delhi, compared to Berlin mothers, placed more emphasis on relational socialization goals and on acknowledging the giver when receiving a gift. The children's culture was related to differences in culture-specific scripts related to gift-giving (Kärtner et al., 2018). Unsurprisingly in the current sample, most children expected the recipient to respond to the prosocial agent by showing culturally appropriate appreciation, such as saying "thank you." To this point, parents said they frequently highlighted the importance of showing appreciation but rarely discussed deservingness or reciprocating the prosocial behavior. It is possible that parents with different cultural values may have different socialization goals, resulting in children having other preconceptions about the prosocial agent's motivations and ways of responding. Future studies should seek to incorporate more participants with diverse value systems to understand better how parents are socializing children's preconceptions about others' prosocial actions and how one should respond to those actions.

One final limitation of the current study is the assumption that intentions are central to an individual's understanding of their social world and what is morally good. Recent research is beginning to question whether intentions are as important as initially assumed (Barrett et al., 2016a; Barrett & Saxe, 2021; Saxe, 2016). While intentions play a central role in moral and legal assessments in large-scale industrialized societies, there is great variation in the degree to which intentions influence moral judgments. For example, smaller-scale, non-western societies such as Hadza, Himba, and Yasawa have

been found to use intentions less in their moral judgments (Clark Barrett et al., 2016). Given that the sample for the present study came from a large-scale industrialized, democratic society, future work should assess the generalizability of these findings to other groups and whether there is variation in children's preconceptions about others' prosocial motives based on the child's culture.

Overall, the present study shows that children not only evaluate the outcome of one's prosocial behavior but also consider one's intention behind the behavior. When asked to guess the prosocial agent's intention, children primarily believe that positive intentions motivate prosocial behavior in others. Moreover, children assume individuals are acting out of concern for the recipient, which seems related to parents' values and socialization goals. Thus, parents and young children discuss and use important intention and motivation information. This information is vital for cooperation and our success as a species, as it helps individuals choose reliable and trustworthy future partners.

While sociomoral disposition labels hint at children's belief that the prosocial agent will act positively in the future, the current study did not test children's use of intentions when predicting the prosocial agent's future behavior. Making accurate predictions about a cooperative partner relies on the internal states underlying the partner's actions, such as their intentions and motivations (Cushman, 2008; Falk & Fischbacher, 2006). Understanding the intentions behind someone's prosocial actions helps individuals distinguish between self-interested and self-less prosocial behavior (Gul & Pesendorfer, 2016). Significantly, the intention underlying an agent's prosocial behavior, such as concern for the person in need or a desire for reciprocity, greatly influences the emotional and behavioral responses to the action as well as the evaluation



of the prosocial agent (Mathews & Green, 2010; Peng et al., 2017; Tsang, 2006). The next chapter of this dissertation will explore how children might incorporate these intentions into their predictions and evaluations of prosocial agents.

### **Chapter 3**

Cooperative partnerships have a long evolutionary history. To compete with other species, early humans formed cooperative relationships with kin and close relatives to accomplish tasks that might be too difficult to achieve alone (Tomasello, 2009). This type of cooperation forms the foundation of our social relationships and shapes our societal structures (Tomasello et al., 2012). Now, modern humans benefit from similar cooperative partnerships by helping with child-rearing, mutual exchange of goods and services, and working together to obtain food (Ainsworth, 1989; Caporael & Brewer, 1995; Waal & Aureli, 1996). While individuals benefit from these cooperative partnerships, the evolution of our large-scale cooperative society necessitates extending cooperation beyond kin and close relatives to novel individuals. It is this predisposition to engage in cooperation with both established cooperative partnerships and novel individuals that account for our success as a species (Tomasello, 2009). Thus, a critical social task we face is to identify cooperative partners who promise to be dependable and trustworthy. How do we solve this challenge?

Many evolutionary tools have been selected for that enable individuals to identify potentially beneficial cooperative partners. Adults and children rely on such tools as physical or cultural similarity, attractiveness, group membership, emotional expressivity, or even the trustworthiness of a face (Caulfield et al., 2016; Jaho et al., 2013; Jessen & Grossmann, 2016; Thomas Boone & Buck, 2003; Todorov et al., 2015). While these

attributes might provide some helpful information about potential partners, these indicators are frequently less accurate than is useful (Judd et al., 1991; Todorov et al., 2015). Relying on cultural or other group membership indicators can lead to greater stereotyping and overestimating a group member's similarity (Judd et al., 1991). Physical characteristics of social attributes (e.g., trustworthiness, friendliness, etc.) are less accurate because they are also potentially conflated with other factors like race and gender (Todorov et al., 2015). In the real world, there is frequent variation in a person's appearance or other physical characteristics. The same person's physical characteristics may lead to different conclusions about social attributes depending on arbitrary factors (e.g., lighting, facial orientation, etc.).

Since information is limited about new potential cooperative partners, individuals must base their evaluations and predictions of future cooperation on their potential partner's previous cooperative behavior (Hamlin, 2013). So, cooperation requires an ability to analyze others' social behaviors so that an individual can identify potential partners who are cooperative, caring, ready to lend a hand, or who are likely to be so in the future. Adults readily use an individual's past behavior when choosing cooperative partners. For instance, an individual's prosocial behavior impacts their reputation within a group, which influences the generosity of the group members and whether that individual remains part of the group (Wedekind & Milinski, 2000). Even strangers readily use a single instance of social behavior to determine whether to punish or be prosocial toward an individual (Balafoutas et al., 2014; Blain et al., 2022). The capacity to understand and make use of an individual's past cooperative behavior emerges early in

development and affects whom children choose as a social partner (Li et al., 2020; Olson & Spelke, 2008; Vaish et al., 2010).

Recent research suggests that even preverbal infants understand and use an individual's past cooperative behavior. By the end of their first year of life, infants understand that agents can work together toward shared goals and categorize goal-helping as positive and goal-hindering as negative (Henderson & Woodward, 2011; Kuhlmeier et al., 2003; Premack & Premack, 1997). This categorization influences children's social preferences, as well as their predictions of others' preferred partners (Cowell & Decety, 2015; Hamlin et al., 2007; Hamlin & Wynn, 2011; Van de Vondervoort & Hamlin, 2017, 2018). By the middle of the second year toddlers expect individuals to treat others fairly, as long as everyone has contributed equally to the cooperative endeavor or is in the same group (Geraci & Surian, 2011; Sloane et al., 2012). The individual's fair (or unfair) behavior informs whether young infants prefer and think others will like to affiliate with an individual (Lucca et al., 2018; Schmidt & Sommerville, 2011). Thus, infants may understand several types of cooperative behaviors that occur between third parties. Moreover, children use this information to form positive and negative impressions of other people's social acts. They then use these impressions to guide their understanding of and desire to form new relationships with those individuals.

To make more reliable and accurate predictions about a potential cooperative partner, it is not enough to use the consequences of individuals' prior actions alone. Importantly, seeking reliable cooperation partners requires that we observe and evaluate whether our potential partners possess the right motivations for acting morally. Adults consider the *mental states* that drove an individual to act, not just whether an individual

acted cooperatively (Cushman, 2008; Falk & Fischbacher, 2006). Mental states and psychological factors (e.g., character traits, moral categories, and character evaluations) are better social indicators and are more helpful in tracking an individual's identity across time (Brooks, 2014). These indicators are thought to be less variable than an individual's actions alone or physical features, such as the trustworthiness of a face. Furthermore, a growing body of evidence shows that people's moral judgment, while partially based on the outcomes of a given action, also rely heavily on the individual's intentions. This is especially true when an individual is deciding whether and how much to reward or punish that individual (Cushman, 2008; Cushman et al., 2013; Killen & Smetana, 2008; Young et al., 2007). Therefore, it would be difficult for us to judge an individual or their behavior accurately without taking internal states into account since many potential factors can motivate an individual's actions.

Most research on children's use of intention information concerns children's understanding of and responses to the intentions behind harmful behaviors (Cushman et al., 2013; Margoni & Surian, 2017). Young children primarily rely on the outcomes associated with the behavior when evaluating the blameworthiness of an individual or whether they deserve to be punished. As children age, they increasingly incorporate actors' intentions into their judgments and behavior (Cushman et al., 2013). There is an "outcome-to-intent shift," where young children rely primarily on the outcomes of others' actions when evaluating harmful actions. Then, beginning around five years of age but consistently at six, children also rely on intentions for these evaluations. For example, young children believe an individual deserves to be punished whether they intentionally or accidentally harmed someone, while older children believe those who intentionally

harm are deserving of punishment. Interestingly, there is some evidence that even 3-year-olds distinguish accidental from intentional harm (Cushman et al., 2013). 3-year-olds avoid helping individuals who harmed or intended to harm, but not individuals who were accidentally harmed (Vaish et al., 2010). These studies indicate that children understand and utilize intentions when navigating their social world. It seems that children are thinking about the intentions behind harmful actions from quite early in development.

While frequently conceptualized as the inverse of harmful actions, helpful actions may be distinct in their cognitions and understanding (Knobe, 2003; Young et al., 2011). Numerous studies demonstrate significant asymmetries in tasks requiring the processing of helpful and harmful actions (Knobe, 2003; Young et al., 2011). For example, adults and children think harmful side effects are stronger cues of intentionality than helpful side effects (Knobe, 2003; Leslie et al., 2006). Negative cues appear to have a greater weight than positive ones, even for young children and preverbal babies (for a review, see Vaish et al., 2008). These studies suggest that children's use and understanding of intentions in helping and harming situations may follow different developmental pathways.

While identifying the intentions underlying harmful behavior helps us avoid partners who may harm us in the future, that may not be sufficient for finding potential cooperative partners who are more likely to *help* us in the future. To identify cooperative and helpful partners, it is crucial that we recognize the intentions underlying prosocial behavior. There is some evidence that children also use intention information when evaluating prosocial behavior. Toddlers prefer those who intentionally help rather than accidentally help (Woo et al., 2017). As with harmful behavior, by six years of age,

children think a prosocial agent is more deserving of praise and rewards when they have intentionally helped rather than accidentally helped (Margoni & Surian, 2017). Even 3-year-olds understand and use intentions to inform their behavior such that they are more likely to reciprocate when someone intentionally, rather than accidentally, acted prosocially towards them (Vaish et al., 2018). This indicates that from quite early in development, children can distinguish accidental from intentional prosocial behavior and prefer those who are intentionally prosocial.

Critically, however, the intentions underlying individuals' prosocial actions can be far more nuanced than this prior work has captured. In our complex social world, prosocial behavior is not simply performed either intentionally or accidentally. From early in development, children display many potential motivations for their own prosocial behavior with the ultimate goal of benefiting themselves or someone else (Eisenberg et al., 2016). For example, children are concerned about the welfare of others and have a fundamental desire to see them receive the help they need (Hepach et al., 2012). Moreover, infants and young children show concern for those in distress, and children's concern motivates their prosocial behavior by their second year of life (Davidov et al., 2021; Vaish et al., 2009; Zahn-Waxler & Radke-Yarrow, 1990). As children age, their prosocial motivations can become more strategic and self-serving (Grueneisen & Warneken, 2022). Children's desire for reciprocity or reputational concerns can also motivate their prosocial behavior. Preschool-aged children adjust their prosocial behavior based on whether an individual is likely to be prosocial and to elicit prosocial behavior from others (Kenward et al., 2015; Sebastián-Enesco & Warneken, 2015; Xiong et al., 2016). In an attempt to manage their reputation, five-year-olds are more generous when

observed by a peer versus unobserved (Engelmann & Rapp, 2018). Thus, the prosocial behavior of young children seems to be driven by both altruistic and egoistic motives.

In Chapter 2 of this dissertation, when children were asked to provide their own reasons for an individual's prosocial behavior with ambiguous motives, we found that most children thought the prosocial individual was acting out of concern or desire to fulfill the needs of someone else. Likewise, when asked to choose from a series of predetermined prosocial motivations, most children believed the prosocial agents acted out of altruistic and other-oriented motives, such as caring for the individual, rather than egoistic and self-interested motives, such as a desire for reciprocity. Children in that study also seem predisposed to believe that others' prosocial behavior is driven by altruistic motives or intrinsic positive character traits. Prior work shows that among children, character traits such as niceness are thought to be more stable over time and more helpful in predicting future behavior than behavior alone (Diesendruck & Lindenbaum, 2009; Heyman & Gelman, 2000). The results from Chapter 2 suggest that from a fairly young age, children do think about what motivates individuals to be prosocial and assume that others are acting out of altruistic motives. Importantly, the intentions behind prosocial behavior are crucial as they help us predict who will be a helpful and cooperative partner in the future. The propensity to infer positive character traits hints that children may be thinking that the prosocial individual will continue to be prosocial, but Chapter 2 did not address how intentions influence children's predictions. Thus, one important aim of this study is to understand how intentions inform children's predictions of future prosocial behavior.

Understanding the intentions behind someone's prosocial actions helps individuals distinguish between altruistic versus egoistic prosocial behavior (Gul & Pesendorfer, 2016). Indeed, even when two agents' prosocial behavior appears physically identical, the agents' immediate motives can differ greatly. These motives carry vital predictive information: When someone acts prosocially with altruistic intentions, it tells us that the person is invested in our welfare, making it highly likely that they will continue to be kind and might be a good partner to have in the future. On the other hand, if someone acts prosocially for egoistic reasons or with negative intentions, it is difficult to predict their future prosocial behavior, as these self-interested motivations may be fulfilled by acting prosocially towards another individual. Thus, we cannot be confident that they will genuinely be a good partner or even act prosocially towards us in the future.

Among adults, the intention underlying an agent's prosocial behavior, such as concern for the person in need or desire for reciprocity, greatly influences the emotional and behavioral responses to the action, as well as the evaluation of the prosocial agent (Mathews & Green, 2010; Peng et al., 2017; Tsang, 2006, 2007). Individuals experience more positive emotion, evaluate the benefactor more positively, and have a stronger desire to affiliate with a prosocial agent who acted out of concern (Greenberg, 1980; Greenberg & Shapiro, 1971; Peng et al., 2017; Tsang, 2006). Moreover, these intentions may motivate individuals to engage in *positive reciprocity*, where an individual rewards someone based on their cooperative behaviors and at times the positive intentions motivating the behaviors (McCabe et al., 2003). When a benefactor is motivated by a desire for reciprocity, individuals experience more negative emotions and may have an



increased willingness to repay the favor due to the unpleasant feelings of indebtedness and less desire to form a relationship with that person, (Tsang, 2007; Peng et al., 2017).

Therefore, altruistic and egoistic intentions can both motivate social behavior and emotional responses that are beneficial for social relationships and cooperation.

Adults also recognize that the motivations of concern for another's welfare and desire for reciprocity represent specific types of relationships. When someone acts out of concern for another's welfare, it signals that they are applying a Communal sharing relationship model, whereas being motivated by the desire for reciprocity indicates an Equality matching relationship model (Fiske 1992). Communal sharing relationships (e.g., close friendships and kin relationships) are described as the "basic form of relationships," wherein individuals are given equal value within the dyad or larger group. Consequently, kindness and altruism are common since the relationship partners share an individual's challenges (Zickfeld et al., 2017). On the other hand, Equality matching relationships (e.g., acquaintances and strangers) are focused on equality and maintaining the relationship's balanced state. So individuals employ concrete matching strategies, such as turn-taking, tit-for-tat reciprocity or retaliation, and equal sharing. Thus, the motivations behind an individual's prosocial behavior indicate the relationship type and expected behavior within that relationship.

Previous work has noted the critical role of intentions and motivations in children's evaluations of others' prosocial and antisocial actions when comparing accidental and intentional actions. Yet very little is known about the development of this sensitivity to prosocial agents' intentions. Given the importance of understanding the motivations of others' prosocial behavior for identifying a good cooperative partner, it is

crucial to understand how children make use of and understand others' prosocial intentions. Thus, the present study aims to understand whether children distinguish between altruistic and egoistic prosocial intentions and how they use these intentions. In this study, two stories were read aloud to the children about two prosocial agents who act with altruistic or egoistic intentions, respectively, toward another individual (the recipient of their prosocial behavior). After each story, children answered questions about the benefactor's motivations, the recipient's emotional response, and the child's own evaluation of the benefactor's actions. Once the children had heard all the prosocial stories, they were asked a series of forced-choice questions to assess their predictions about the prosocial agents and the recipient.

We hypothesize that, as children age, they become more sensitive to the altruistic and egoistic intentions behind an individual's prosocial actions. Children will consistently distinguish altruistic and egoistic intentions by six years old and incorporate intentions into their evaluations of prosocial agents. Moreover, children will use these intentions to determine how they think the recipient emotionally responds to the prosocial action and will act towards the prosocial agents in the future. We hypothesize that children will also use these intentions to guide their behavior and understanding of the characters' relationships. In the case of reciprocity, it is possible that children may think the recipient will reciprocate towards the egoistic prosocial agent, if children believe that the recipient is motivated by indebtedness. On the other hand, if the children believe that the recipient is motivated a desire to engage in positive reciprocity, then we hypothesize that the children will believe the recipient would be more likely to reciprocate towards the altruistic agent.

## Method

### Participants

The study was within-subjects with two counterbalanced Protagonists: Altruistic or Egoistic. Our planned sample size was  $N = 96$  based on a power analysis using R, with an effect size of 0.36, a power of 0.8, and an alpha of 0.05 (based on Margoni & Surian, 2017). The power analysis determined that a sample size of 82 was required but given the counterbalancing of the three age groups and four presentation orders included in this study, the final sample size was set at  $N = 96$ . Participants were 4- and 5-year-olds ( $n = 32$ ; 17 girls; 8 children per condition) between 48 months and 71 months ( $M = 62$  months, 27 days;  $SD = 194.98$  days), 6- and 7-year-olds ( $n = 32$ ; 16 girls; 8 children per condition) between 72 months and 95 months ( $M = 82$  months, 19 days;  $SD = 208.44$  days), and 8- to 9-year-olds ( $n = 16$ ; 20 girls; 8 children per condition) between 96 months and 119 months ( $M = 105$  months, 19 days;  $SD = 226.73$  days) in a medium-sized Mid-Atlantic city. The sample was predominantly middle class and White (White = 72.2%, Asian = 4.6%, African American = 1.9%, Hispanic = 1.9%, more than one race = 16.7%). Eight additional participants were excluded from the analysis: three failed the character evaluation training, two did not pass the comprehension checks about the stories, one participant's parents interfered in the study procedure, and two due to internet connectivity issues.

### Setting

The study was conducted synchronously online via Zoom. Children were primarily in their homes on either a computer or tablet. The experimenter requested that parents not use cell phones to ensure children could see and understand the components

of the study. The child listened to four vignette stories presented on Qualtrics, where the experimenter documented all child responses. The researchers used Zoom to record and transcribe the children's verbal and behavioral responses, which were used to quantify the children's data.

## **Procedure**

### ***Character Evaluation Scale***

After a brief introduction and warm-up with the child via Zoom, the researcher shared her computer screen so that the child would be able to watch the animations. First, the child watched a training video about using a 5-point character evaluation scale, which consisted of a series of smiling and frowning faces (see Figure 16). The scale ranged from one to five and was accompanied by verbal character evaluations (really, really bad, a little bad, just okay, a little good, really, really good). After watching the training video, the child pointed and verbalized the locations of all the character evaluations as a comprehension check (e.g., "Where would you point if something is a little bad?"). All five points on the character evaluation scale were probed. The question was repeated if the child failed to provide an answer or answered the question incorrectly. If the child still did not answer or answered incorrectly, they were removed from the analyses.

**Figure 16**

*The Series of Smiling and Frowning Faces used to Evaluate the Prosocial Agent*

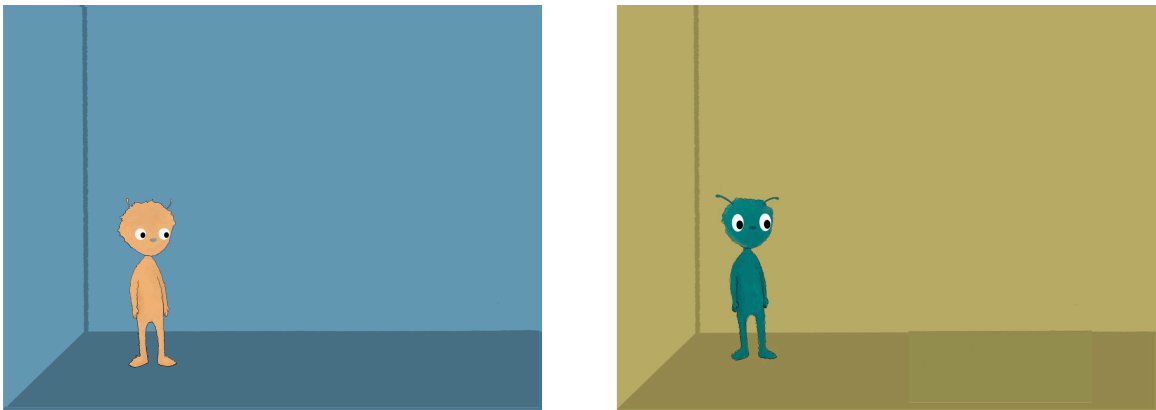


***Introduction to Prosocial Agent and Recipient***

Following the Character Evaluation Scale training, the E introduced the prosocial agents by displaying a picture of the agent (Green or Yellow). Only one agent was introduced at a time. The prosocial agents were drawn as non-human figures to limit potential existing biases (see Figure 17).

**Figure 17**

*The Visuals that Represent the Prosocial Agents “Yellow” and “Green.”*



The agent was gender-matched to the child’s self-endorsed gender, which was asked at the beginning of the study. Hereafter feminine pronouns will be used for clarity. The experimenter then played a video that told the children about the prosocial agent’s motivations for her prosocial actions (Altruistic or Egoistic). Children first heard the motivations and the two stories of the first prosocial agent before being introduced to and hearing the motivations and two stories of the second prosocial agent. The same narrator recorded all stories with the same tone of voice to ensure consistency across presentations. The presentation order for the motivation (Altruistic or Egoistic) and the character performing the prosocial behavior were counterbalanced. If Yellow appeared first and had egoistic motivations, Green appeared last and had altruistic motivations. To ensure comprehension, experimenter asked the child why the prosocial agent helps others. If the child answered incorrectly, the experimenter replayed the video explaining the prosocial agent’s motivation. If the child responded incorrectly twice, the experimenter proceeded to the prosocial stories, and that child was excluded from analyses.

The prosocial agent’s motivations were described as follows:

*Egoistic intention introduction:* “Yellow helps others because she wants them to give her things! She really likes it when someone gives something to her. So Yellow helps others because she wants to get things from them.”

*Altruistic intention introduction:* “Green helps others because she cares about them! She really likes it when she can help someone she cares about! So Yellow helps because she cares about the person.

After learning about the prosocial agent’s motivations, the child was introduced to the recipient of both Green and Yellow’s prosocial actions. The female recipient was named Kylie, and the male recipient was called Kyle (see Figure 18; gender-matched to the child; hereafter, “Kylie” for simplicity).

### **Figure 18**

*The Visuals that Represent the Recipients, Kyle and Kylie*



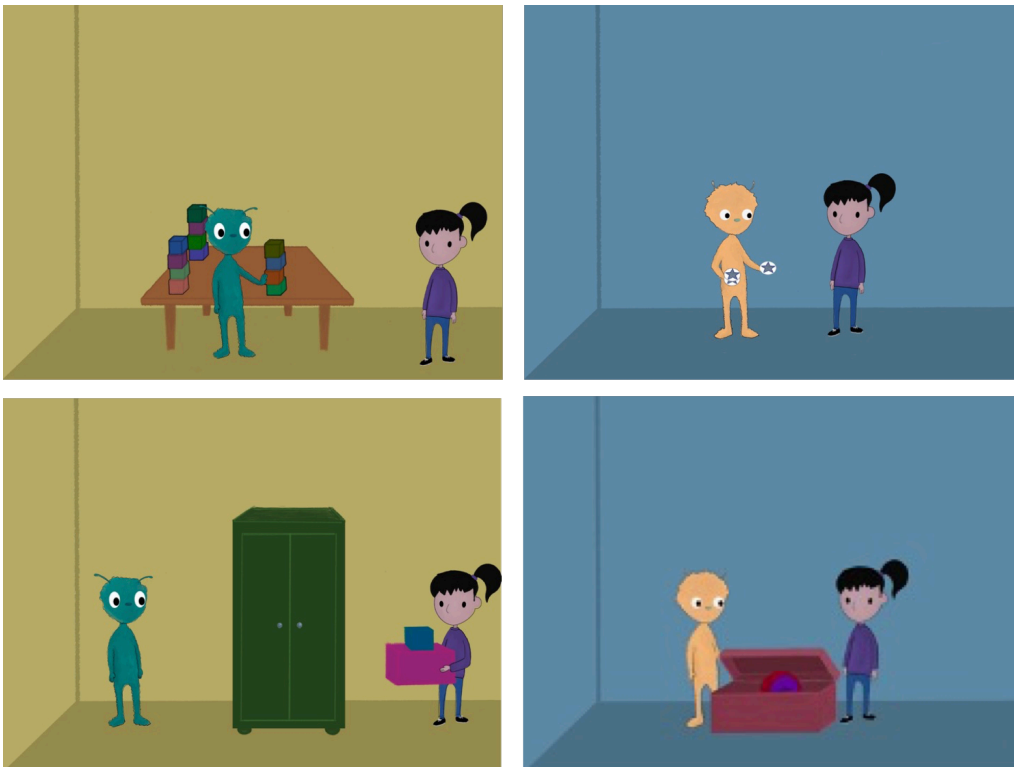
### ***Prosocial Stories***

Following the introduction to one of the prosocial agents (Yellow or Green) and the recipient, the child watched a series of videos that presented stories about that prosocial agent in a storybook format. The narrator read two stories aloud to the child, accompanied by drawings depicting the relevant scenes. In these stories, prosocial agents (Yellow or Green) help the recipient achieve a goal (i.e., open a toybox or open a cabinet;

see Figure 19) and share resources (a sticker or block tower; see Figure 19) with the recipient. The presentation order of the prosocial agents was counterbalanced as was the presentation order of the type of prosocial behavior. After the prosocial action, the prosocial agent was described as repeating her motivations for helping or sharing (e.g., “I helping you open this cabinet because I care about you.”) the prosocial agent. The experimenter asked the child why the prosocial agent helped or shared to ensure comprehension. If the child answered incorrectly, the experimenter replayed the prosocial story video. If the child responded incorrectly twice, the experimenter proceeded to the prosocial stories, and that child was excluded from analyses. The child heard both prosocial stories for a given prosocial agent (altruistic or egoistic) before the child heard the introduction for the next prosocial agent.

**Figure 19**

*The Visuals that Represent the Sharing and Helping Prosocial Stories*



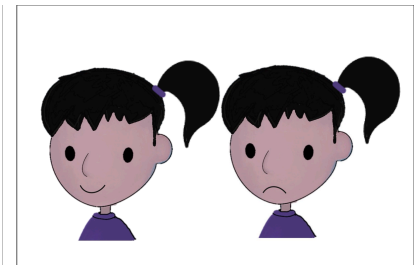
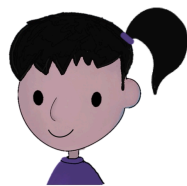


### ***Recipient Emotional Response***

After *each* story, the experimenter asked the child how Kylie felt about the prosocial agent who helped or shared. For example, “How did Kylie feel when Green gave her one of her block towers?” Children selected from three predetermined choices that appeared in a fixed order with corresponding pictural representations: “Just happy,” “Just unhappy,” and “Both happy and unhappy” (see Figure 20). After the child selected a response, the child was asked to provide a justification for the chosen emotional state (e.g., “Why do you think Kylie feel just happy?”). If the child did not respond, the experimenter prompted the child by saying, “There is no right or wrong answer. What do you think?”

**Figure 20**

*The Visuals that Represent the Recipient Emotion*



### ***Character Evaluations***

After hearing both stories about a given agent, the experimenter asked the child to evaluate the agent using the Character Evaluation Scale (e.g., “How bad or good is Green?”). The experimenter read all the answer choices to the child. The child then rated the agent on the 5-point Likert scale and gave the experimenter a verbal response. After the child provided a rating, the experimenter asked the child an open-ended question to elicit a justification for her answer (e.g., “Why do you think Green is really, really

good?”). If the child did not respond, the experimenter prompted the child by saying, “There is no right or wrong answer. What do you think?” When the child provided a justification, E did not give any feedback on the content of their responses.

### ***Forced-choice Test Questions***

After the children had heard all four stories, selected kylie’s emotional reactions, and provided character evaluations for both prosocial agents, the child was told that the experimenter had some questions about Yellow and Green. First, the experimenter reread the prosocial agents’ introductions to remind the child of the prosocial agents’ motivations for their actions. Children were then asked the following test questions (adapted from Vaish et al., 2011):

1. “Who is Kylie’s best friend, Yellow or Green?”
  - 1.1. “Why do you think she is Kylie’s best friend?”
2. Kylie is having a birthday party but can only invite one more person. Should she invite Yellow or Green?”
  - 2.1. “Why should Kylie invite her to the birthday party?”
3. “Kylie has an eraser and wants to give one to someone. Whom should she give the eraser to, Yellow or Green?”
  - 3.1. “Why should Kylie give an eraser to her?”
4. “If you fell over, who do you think would NOT help you, Yellow or Green?”
  - 4.1. “Why would she not help you?”
5. “If you needed someone to help, would you ask Yellow or Green?”
  - 5.1. “Why would you ask her for help?”
6. “Who cares more about herself, Yellow or Green?”
  - 6.1. “Why does she care more about herself?”

Questions 1-6 were forced-choice questions designed to assess whether children incorporated intentions, their understanding of the characters, and predictions of future behavior when presented with the choice. Question 1 estimated how children used

intention information when thinking about Kylie's relationship with the prosocial agents. Questions 2 and 3 evaluated children's predictions about Kylie's desire to affiliate and reciprocate. Questions 4 and 5 investigated how the children would apply the intentional information to themselves. Question 6 assessed whether children interpreted the prosocial agent's to be self-motivated.

In answering the forced-choice questions, children were expected to name and point to one of the prosocial agents. If a child responded with "Both" or "Neither," E encouraged the child to choose one. If a child did not respond, E repeated the question, but if the child still did not respond, E moved on to the next question. Questions 1.1–6.1 were open-ended questions meant to elicit justifications for children's responses to the forced-choice questions. If the child did not provide a reply, the E prompted the child by saying, "There is no right or wrong answer. What do you think?" When the child provided a justification, E did not give any feedback on the content of their responses.

### ***Counterbalancing and Randomization***

Children in each age group were randomly assigned to one of 4 presentation orders, which counterbalanced the following: which prosocial agent appeared first and which agent was the altruistic or egoistic agent. The order of the test questions and the location of Yellow and Green during the test questions (left or right) was randomized within Qualtrics.

### ***Coding and Reliability***

The primary coder (the first author) used the video recording of the participants to code whether children responded correctly to the comprehension and forced-choice test questions. Responses were scored one if they were consistent with the hypotheses that

children should (a) believe the Altruistic prosocial agent is Kylie's best friend, (b) think the Altruistic prosocial agent should be invited to the birthday party, (c) think the Egoistic prosocial agent is less likely to help in the future, (d) prefer to ask the Altruistic prosocial agent for help and, (e) think the Egoistic prosocial agent cares more about themselves; responses not consistent with these hypotheses were scored 0. For the question "[...] whom should Kylie give the eraser to?", it is possible that children think Kylie would be motivated by indebtedness and share the eraser with the Egoistic prosocial agent or Kylie engages in positive reciprocity and rewards the Altruistic prosocial agent for her positive prosocial intentions. Both potential hypotheses were coded as above (i.e., 1 for hypothesized agent and 0 for the other agent) and children's behavior would determine which hypothesis was supported. A second coder (unaware of condition and hypotheses) coded a randomly selected 50% of the sample from the videos for comprehension questions and forced-choice test questions. Reliability was perfect for all measures (all  $\kappa$ s = 1.00).

Additionally, the primary coder used transcripts and video recordings to code the children's justifications for recipient emotion and character evaluations. Each justification was assigned a score of 0, 1, or 2 (see Table 1 for details of the coding scheme). Justifications were assigned a score of 1 if they referenced the prosocial agent's actions or the outcome of the prosocial behavior. Justifications were assigned a score of 2 if they indicated relevant and sophisticated reasoning about the prosocial agent and her intentions, including justifications that referred to her motivations or involved the prosocial agent's moral character (e.g., "Because she does things for other people but she still always wants things in return" or "she is good and nice because she helps people").

All other justifications were assigned a 0, including children’s own preference for a given character, unintelligible, irrelevant justifications, or providing no justification. A second coder (unaware of the hypotheses) coded justifications of a random 25% of children for each question type. Reliability was perfect (all  $\kappa$ s = 1.00).

**Table 1**

*Coding Scheme for Justifications*

Score	Category	Content
2	Motivations	References the prosocial agent’s motives for their actions; for example, “Green only did it because she wanted something later”
	Moral character or norms	Prosocial agent is a good (or bad) person or prosocial agent broke (or did not break) a moral norm; for example, “Green is a really good friend.” or “if you do kindness, you shouldn’t expect something back”
1	Action	Prosocial agent helped or shared; for example, “Because she helped”
	Outcome	Consequences of the prosocial agent’s actions; for example, “now Kylie has some stickers”
0	Other, irrelevant, or uncodable	Response could not be put into any of the above categories, was irrelevant, or could not be coded

## Results

As preliminary analyses revealed no gender effects, gender was not included in further analyses. Nonparametric analyses were required as the data were not normally distributed. All reported  $p$ -values are two-tailed. A series of analyses were conducted to investigate how intentions influenced children’s behaviors and predictions about the prosocial agents and the recipient. When available, children’s justifications for their responses were compared within and across age groups.

First, a series of Wilcoxon Signed-Rank tests were used to compare whether children predicted different emotional responses for the recipient when the prosocial

agents shared. Next, Wilcoxon Signed-Rank tests were conducted to compare whether children predicted different emotional responses for the recipient when the prosocial agents helped. Following these analyses, children's evaluations of the prosocial partners were compared with a series of Wilcoxon Signed-Rank analyses. After, analyses were conducted to compare whether children answered the forced-choice questions in the hypothesized ways and whether these responses differed across age groups.

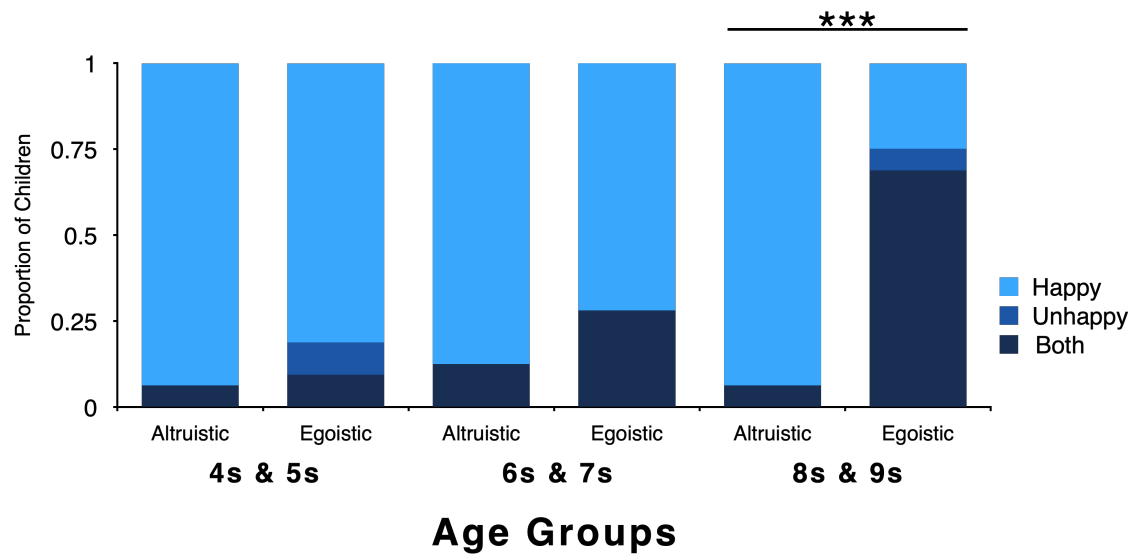
### **Recipient Emotional Response after Sharing**

A Wilcoxon Signed-Rank test was conducted to compare the 4- and 5-year-olds' predicted emotional responses for the recipient after being shared with either by the Egoistic or the Altruistic prosocial agent. The Wilcoxon Signed-Rank test indicated no significant difference in the recipient's predicted emotional response after being shared with by either prosocial agent ( $z = -1.82, p = .068$ ; Figure 21). Most 4- and 5-year-olds predicted that Kylie would feel "just happy" after being shared with by the Altruistic prosocial agent (93.8%, 30 of 32 children) and the Egoistic prosocial agent (81.3%, 26 of 32 children). Similarly, a Wilcoxon Signed Rank test of 6- and 7-year-olds found no significant difference in the recipient's predicted emotional response ( $z = -.905, p = .366$ ). Most 6- and 7-year-olds predicted that Kylie would feel "just happy" after being shared with by the Altruistic prosocial agent (87.5%, 28 of 32 children) and the Egoistic prosocial agent (71.9%, 23 of 32 children). In contrast, a Wilcoxon Signed Rank test for 8- and 9--year-olds revealed that these older children were more likely to think that the recipient would feel less happy after being shared with by the Egoistic prosocial agent than the Altruistic prosocial agent ( $z = -4.84, p < .001$ ). Most 8- and 9-year-olds predicted Kylie would feel "just happy" after being shared with by the Altruistic prosocial agent

(93.8%, 30 of 32 children), whereas most predicted Kylie would feel “both Happy and Unhappy” after being shared with by the Egoistic prosocial agent (71.9%, 23 of 32 children).

### Figure 21

*The Proportion of Children who Chose a Given Recipient Emotional Response after Being Shared with by the Altruistic or Egoistic prosocial agent (total N=96)*



### *Justification for Recipient Emotional Response after Sharing*

Children’s justifications for the recipient’s emotional response after the prosocial agent shared were compared across the age groups. For 4- and 5-year-old and 6- and 7-year-old children, Wilcoxon Signed Rank test analyses comparing the type of justification given for Altruistic or Egoistic prosocial agents revealed no difference in the kind of justification provided (all  $ps > .655$ ). Most children in these age groups referenced the actions or outcomes of a given prosocial agent’s behavior (range 59.4% to 81.3%; *see Table 2*). On the other hand, the Wilcoxon Signed-Rank test found a significant difference among the 8- and 9-year-old children in the type of justifications

provided for the two prosocial agents ( $z = -3.74, p < .001$ ). When discussing the recipient's emotional response, most 8- and 9-year-old children referenced the actions and outcomes of the Altruistic prosocial agent (78.1%, 25 of 32 children), while most referenced the motivations of the Egoistic prosocial agent (65.6%, 21 of 32 children).

**Table 2**

*Children's Justifications for Recipient Emotional Response after Prosocial Agent Shared*

Justification	4- and 5-year-olds		6- and 7-year-olds		8- and 9-year-olds	
	Altruistic	Egoistic	Altruistic	Egoistic	Altruistic	Egoistic
0	9.4% (3)	9.4% (3)	6.2% (2)	6.2% (2)	0% (0)	0% (0)
1	81.3% (26)	78.1% (25)	59.4% (19)	65.6% (21)	78.1% (25)	34.4% (11)
2	9.4% (3)	12.5% (7)	34.4% (11)	28.1% (9)	21.9% (7)	65.6% (21)

Note. The values represent the percentage of children (raw numbers in parentheses)

**Recipient Emotional Response after Helping**

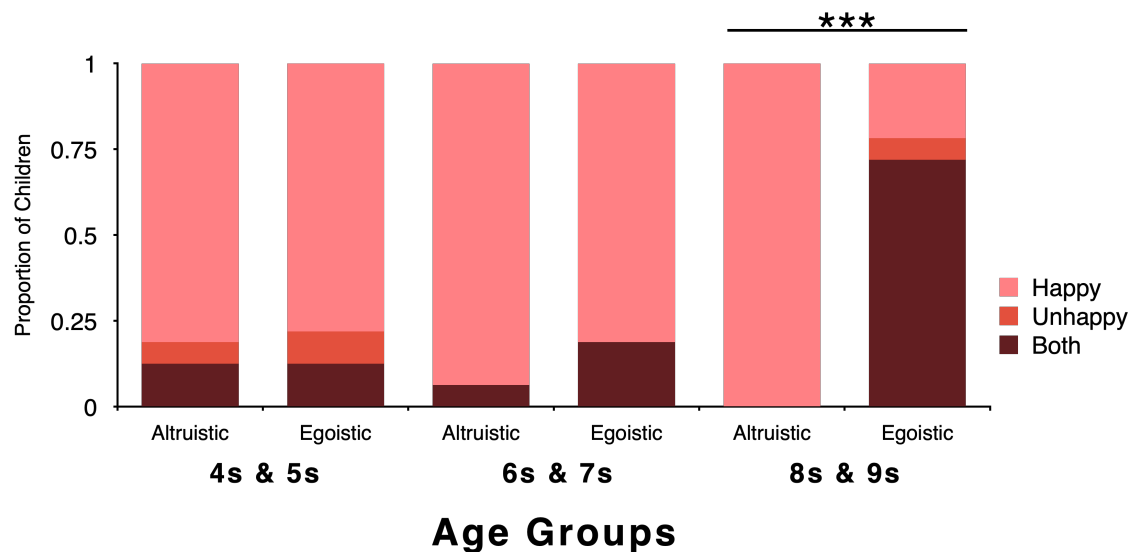
As with the recipient's emotional response following prosocial agent sharing, Wilcoxon Signed Rank tests were conducted to compare children's predicted emotional response for the recipient after receiving help from either the Egoistic prosocial agent or the Altruistic prosocial agent. The Wilcoxon Signed-Rank test indicated no significant difference among the 4- and 5-year-olds in the recipient's predicted emotional response after receiving help from either prosocial agent ( $z = -.513, p = .608$ ; Figure 22). Most 4- and 5-year-olds predicted that Kylie would feel "just happy" after receiving help from the Altruistic prosocial agent (81.3%, 26 of 32 children) and the Egoistic prosocial agent (78.1%, 25 of 32 children). Likewise, a Wilcoxon Signed-Rank test of 6- and 7-year-olds found no significant difference in the recipient's predicted emotional response ( $z = -1.67, p = .096$ ). Most 6- and 7-year-olds predicted that Kylie would feel "just happy" after receiving help from the Altruistic prosocial agent (93.8%, 30 of 32 children) and the



Egoistic prosocial agent (81.3%, 26 of 32 children). In contrast, a Wilcoxon Signed-Rank test for 8- and 9-year-olds revealed that these older children were more likely to think that the recipient would feel less happy after receiving help from the Egoistic prosocial agent than Altruistic prosocial agent ( $z = -4.71, p < .001$ ). Most 8- and 9-year-olds predicted Kylie would feel “just happy” after receiving help from the Altruistic prosocial agent (100%, 32 of 32 children), whereas most predict Kylie would feel “both Happy and Unhappy” after being shared with by the Egoistic prosocial agent (68.8%, 22 of 32 children).

**Figure 22**

*The Proportion of Children who Chose a Given Recipient Emotional Response after Being Helped by the Altruistic or Egoistic prosocial agent (total N=96)*



***Justification for Recipient Emotional Response after Helping***

As with the justifications used when discussing the recipient’s emotional response after being shared with, children’s justifications were compared across the age groups for the recipient's emotional response after receiving help. Wilcoxon Signed-Rank test

analyses comparing the type of justification given for Altruistic or Egoistic prosocial agents revealed no difference in whether 4- and 5-year-old or 6- and 7-year-old children provided a particular kind of justification (all  $ps > .248$ ). Most children in these age groups referenced the actions or outcomes of a given prosocial agent's behavior after providing help (range 53.1% to 90.6%; *see Table 3*). In contrast, the Wilcoxon Signed-Rank test found a significant difference in the type of justifications provided for a given prosocial agent by 8- and 9-year-old children ( $z = -2, p = .046$ ). When discussing the recipient's emotional response, most 8- and 9-year-old children referenced the actions and outcomes of the Altruistic prosocial agent (68.8%, 22 of 32 children), while most referenced the motivations of the Egoistic prosocial agent (59.4%, 19 of 32 children).

**Table 3**

*Children's Justifications for Recipient Emotional Response after Receiving Help*

Justification	4- and 5-year-olds		6- and 7-year-olds		8- and 9-year-olds	
	Altruistic	Egoistic	Altruistic	Egoistic	Altruistic	Egoistic
0	15.6% (5)	9.4% (3)	0% (0)	12.5% (4)	0% (0)	3.1% (1)
1	68.8% (22)	68.8% (22)	90.6% (29)	53.1% (17)	68.8% (22)	37.5% (12)
2	15.6% (5)	21.9% (7)	9.4% (3)	34.4% (11)	31.3% (10)	59.4% (19)

Note. The values represent the percentage of children (raw numbers in parentheses)

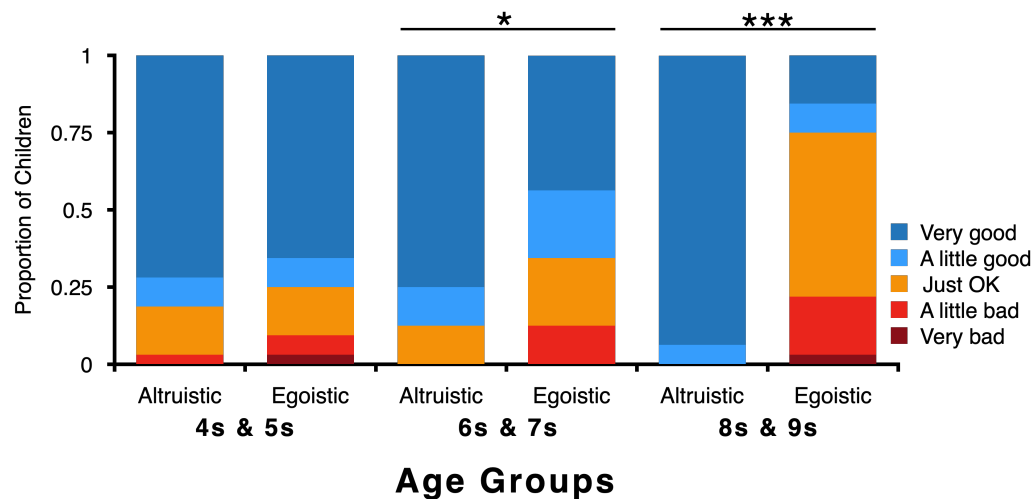
**Character Evaluations**

As with the recipient emotional response, Wilcoxon Signed Rank tests were conducted to compare children's character evaluations of the Egoistic versus Altruistic prosocial agents. Among the 4- and 5-year-olds, there was no significant difference in the character evaluations of the Egoistic prosocial agent ( $M = 4.28, SD = 1.14$ ) and the Altruistic prosocial agent ( $M = 4.5, SD = .88$ ),  $z = -.843, p = .399$ ; Figure 23). In contrast

to the emotional response findings, a Wilcoxon Signed Rank test revealed that 6- and 7-year-olds evaluated the Egoistic prosocial agent ( $M = 3.97$ ,  $SD = 1.09$ ) as less good than the Altruistic prosocial agent ( $M = 4.62$ ,  $SD = .71$ ) ( $z = -2.29$ ,  $p = .022$ ). Similarly, a Wilcoxon Signed Rank test of 8- and 9-year-olds' character evaluations also demonstrated a significant difference, such that the Egoistic prosocial agent ( $M = 3.16$ ,  $SD = 1.02$ ) was evaluated as less good than the Altruistic prosocial agent ( $M = 4.94$ ,  $SD = .25$ ) ( $z = -4.645$ ,  $p < .001$ ).

**Figure 23**

*The Proportion of Children who Chose a Given Character Evaluation for Each Prosocial Agent (total  $N=96$ )*



### ***Justifications for Character Evaluations***

As with the justifications provided for recipient's predicted emotional responses, children's justifications for their character evaluations were compared across the age groups for their character evaluation of the prosocial agents. Wilcoxon Signed-Rank test analyses revealed no difference within an age group in the type of justification provided,

such that in a given age group, children were likely to use similar justifications for both the Altruistic and Egoistic prosocial agents (all  $p$ s > .371).

Kruskal-Wallis analyses revealed a significant difference between age groups in the type of justifications provided for both the evaluation of the Altruistic prosocial agent ( $H(2) = 15.33, p < .001$ ) and the Egoistic prosocial agent ( $H(2) = 12.78, p = .002$ ). To explore what age groups may be driving this effect, follow-up Mann-Whitney  $U$  tests were conducted for both agents. For their evaluations of the Altruistic prosocial agent, the follow-up Mann-Whitney  $U$  tests demonstrated that the 4- and 5-year-olds significantly differed from both the 6- and 7-year-olds ( $U = 367, p = .027$ ) and 8- and 9-year-olds ( $U = 267, p < .001$ ) in the type of justifications provided. No difference was found between 6- and 7-year-olds' and 8- and 9-year-olds' justifications for their evaluations of the Altruistic prosocial agent ( $U = 413.5, p = .079$ ). When discussing their evaluations of the Altruistic prosocial agent, most 4- and 5-year-old children referenced the actions and outcomes of the Altruistic prosocial agent's actions (56.3%, 18 of 32 children; see Table 4), while most 6- and 7-year-olds (65.6%, 21 of 32 children) and 8- and 9-year-olds (84.4%, 27 of 32 children) referenced the motivations of the Altruistic prosocial agent.

The Mann-Whitney  $U$  test of the justifications for Egoistic prosocial agent revealed that the 8- and 9-year-olds significantly differed from both the 4- and 5-year-olds ( $U = 298, p < .001$ ) and the 6- and 7-year-olds ( $U = 348, p = .005$ ). Interestingly, there was no significant difference in the types of justifications provided by the 4- and 5-year-olds and 6- and 7-year-olds ( $U = 460, p = .434$ ). When discussing their evaluations of the Egoistic prosocial agent, most 8- and 9-year-old children referenced the motivations of the Altruistic prosocial agent's actions (56.3%, 18 of 32 children). While

the younger age groups provided a variety of justifications, both 4- and 5-year-olds (45.9%, 15 of 32 children) and 6- and 7-year-olds (56.3%, 18 of 32 children) mentioned motivations more often than other justifications.

**Table 4**

*Children's Justifications for Character Evaluations*

Justification	4- and 5-year-olds		6- and 7-year-olds		8- and 9-year-olds	
	Altruistic	Egoistic	Altruistic	Egoistic	Altruistic	Egoistic
0	6.2% (2)	9.4% (3)	3.1% (1)	6.3% (2)	0% (0)	0% (0)
1	56.3% (18)	43.8% (14)	31.3% (10)	37.5% (12)	15.6% (5)	12.5% (4)
2	37.5% (12)	46.9% (15)	65.6% (21)	56.3% (18)	84.4% (27)	87.5% (28)

Note. The values represent the percentage of children (raw numbers in parentheses)

**Forced-choice Test Questions**

A series of Kruskal-Wallis tests were conducted to assess if there were any differences between age groups in their preference for the hypothesized prosocial agent in the forced-choice questions. The proportion of children who answered the forced-choice questions in the hypothesized directions is represented in Figure 24. The Kruskal-Wallis analyses revealed that on two of the six forced-choice test questions, children's age group significantly affected their preference for the hypothesized prosocial agent. The two questions that did reveal a significant age-group difference were the questions about which prosocial agent was Kylie's best friend ( $H(2) = 7.12, p = .028$ ) and whom the child would prefer to ask for help ( $H(2) = 10.75, p = .005$ ). Follow-up Chi-square tests of independence were conducted to explore, pairwise, how the age groups may differ in the responses to these forced-choice questions.

The Chi-square tests demonstrated that the 4- and 5-year-olds' (71.9%, 23 of 32 children) were less likely to say that the Altruistic prosocial agent and Kylie were best friends than 8- and 9-year-olds (93.8%, 30 of 32 children;  $\chi^2(1, N = 64) = 5.38, p = .02, V = .29$ ) and marginally less than the 6- and 7-year-olds (90.6%, 29 of 32 children;  $\chi^2(1, N = 64) = 3.69, p = .055, V = .24$ ). There was no difference between 6- and 7-year-old and the 8- and 9-year-olds' responses ( $p = .641$ ). The Chi-square tests demonstrated that the 4- and 5-year-olds (65.6%, 21 of 32 children) were less likely to say they would ask the Altruistic prosocial agent would not help them in the future 6- and 7-year-olds' (96.9%, 31 of 32 children;  $\chi^2(1, N = 64) = 11.26, p = .001, V = .400$ ), but neither group differed significantly from the 8- and 9-year-olds (84.4%, 27 of 32 children; both  $p > .082$ ). Overall, it appears that 4- and 5-year-olds were less likely to answer the forced-choice questions in the hypothesized ways than the other age groups.

A series of Chi-square goodness of fit tests were conducted to see whether the children in each age group answered the forced-choice questions in the hypothesized ways.

#### ***4- and 5-year-olds***

Chi-square goodness of fit analyses indicated that the youngest age group, 4- and 5-year-olds, drew the hypothesized inferences for three of the six questions. More 4- and 5-year-olds were more likely to endorse that the Altruistic prosocial agent is Kylie's best friend (71.87%, 23 of 32 children) than the Egoistic prosocial agent,  $\chi^2(df=1) = 6.12, p=.013$ . This age group believed Kylie should invite the Altruistic prosocial agent to her birthday party (68.75%, 22 of 32 children) rather than the Egoistic prosocial agent,  $\chi^2(df=1) = 4.5, p=.034$ . Lastly, 4- and 5-year-olds thought that the Egoistic prosocial

agent cared more about herself (68.75%, 22 of 32 children) than the Altruistic prosocial agent,  $\chi^2(df=1) = 4.5, p=.034$ .

### ***6- and 7-year-olds***

Chi-square goodness of fit analyses indicated that 6- and 7-year-olds also drew the hypothesized inferences for three of the six questions. Like the youngest age group, 6- and 7-year-olds were more likely to endorse that the Altruistic prosocial agent is Kylie's best friend (90.63%, 29 of 32 children) than the Egoistic prosocial agent,  $\chi^2(df=1) = 21.13, p < .001$ . This age group thought that Kylie should invite the Altruistic prosocial agent to her birthday party (81.25%, 26 of 32 children) rather than the Egoistic prosocial agent,  $\chi^2(df=1) = 12.5, p < .001$ . Unlike the 4- and 5-year-olds, this age group said they would ask the Altruistic prosocial for help (96.87%, 31 of 32 children) rather than the Egoistic prosocial agent,  $\chi^2(df=1) = 28.13, p < .001$ .

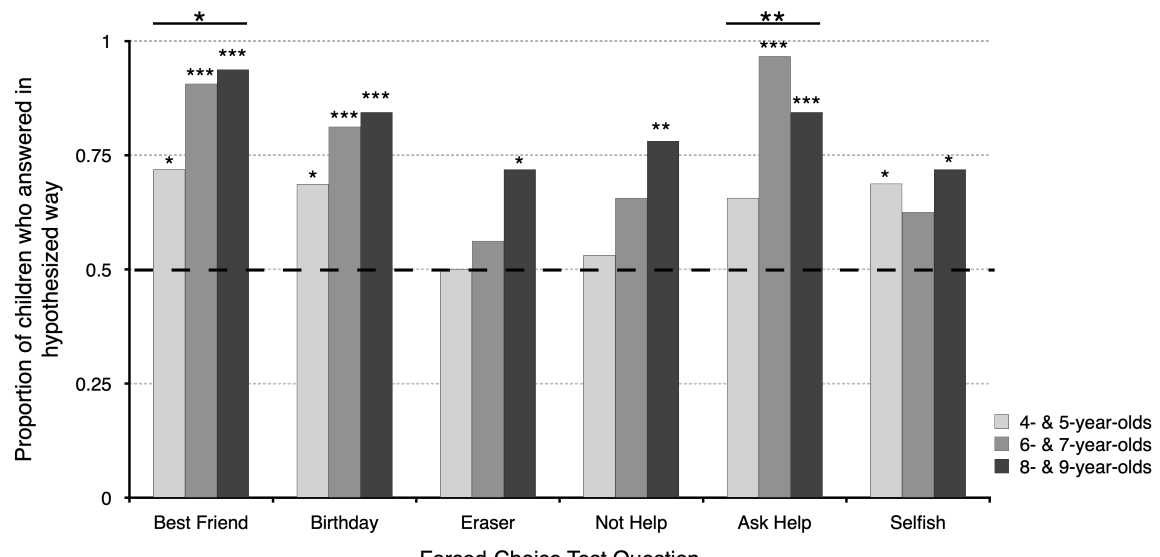
### ***8- and 9-year-olds***

Chi-square goodness of fit analyses indicated that 8- and 9-year-olds drew all but one of the hypothesized inferences. Like both younger age groups, 8- and 9-year-olds were more likely to think that the Altruistic prosocial agent is Kylie's best friend (93.75%, 30 of 32 children) rather than the Egoistic prosocial agent,  $\chi^2(df=1) = 24.5, p < .001$ . This age group also thought that Kylie should invite the Altruistic prosocial agent to her birthday party (84.37%, 27 of 32 children) rather than the Egoistic prosocial agent,  $\chi^2(df=1) = 15.13, p < .001$ . Like the 6- and 7-year-olds, this age group said they would ask the Altruistic prosocial agent for help (84.37%, 27 of 32 children) rather than the Egoistic prosocial agent,  $\chi^2(df=1) = 15.13, p < .001$ . As with the 4- and 5-year-olds, the 8- and 9-year-olds thought that the Egoistic prosocial agent cared more about herself

(71.87%, 23 of 32) than the Altruistic prosocial agent,  $\chi^2(df=1) = 10.13, p=.034$ . Unlike the younger age groups, the 8- and 9-year-olds were more likely to think that the Egoistic prosocial agent (78.13%, 25 of 32 children) would not help them if they fell  $\chi^2(df=1) = 28.13, p < .001$ . In line with the hypothesis that children reward an individual's prosocial intentions, the 8- and 9-year-olds believed that Kylie should give her eraser to the Altruistic prosocial agent (71.87%, 23 of 32 children) rather than the Egoistic prosocial agent ( $\chi^2(df=1) = 6.12, p = .013$ ).

### Figure 24

*The Proportion of Children in each Age Group who Answered Each Test Question in the Hypothesized Way. (total N=96)*



Note. The dashed line indicates chance level. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



### *Justifications for Forced-choice Test Questions*

Children’s justifications were compared across the age groups. Justifications were only included in analyses if children had answered in the hypothesized direct (e.g., children who thought the Altruistic agent was Kylie’s best friend). Kruskal-Wallis analyses revealed a significant age group difference in the type of justification provided for only one of the six forced-choice questions, which was the question about who was the recipient’s “best friend” ( $H(2) = 15.33, p < .001$ ). Follow-up Mann-Whitney U tests were conducted to explore how the age groups may differ. The Mann-Whitney  $U$  tests demonstrated that the 4- and 5-year-olds significantly differed from both the 6- and 7-year-olds ( $U = 216.5, p = .009$ ) and 8- and 9-year-olds ( $U = 174, p < .001$ ) in the type of justifications provided for choosing the Altruistic prosocial agent. No difference was found between 6- and 7-year-olds and 8- and 9-year-olds’ justifications for choosing the Altruistic prosocial agent ( $U = 373.5, p = .075$ ). Most 4- and 5-year-old children referenced the intentions of the Altruistic prosocial agent’s actions (47.8%, 11 of 23 children; see Table 4), but nearly all of 6- and 7-year-olds (82.8%, 24 of 29 children) and 8- and 9-year-olds (96.7%, 29 of 30 children) referenced the motivations of the Altruistic prosocial agent (see Table 5).

**Table 5**

#### *Children’s Justifications for “Best Friend” Forced-choice Question*

Justification	4- and 5-year-olds	6- and 7-year-olds	8- and 9-year-olds
0	21.7% (5)	6.9% (2)	0% (0)
1	30.4% (7)	10.3% (3)	3.3% (1)
2	47.8% (11)	82.8% (24)	96.7% (29)

Note. The values represent the percentage of children (raw numbers in parentheses). Only children who answered the question in the hypothesized direction are described in the table.

## Discussion

In this study, we examined whether children distinguish between altruistic and egoistic motivations when someone acts prosocially. More specifically, the study investigated when and how children understand and use the type of prosocial intentions. Supporting our hypotheses, this study found that children do incorporate intentions into their understanding of another's prosocial actions. Beginning at six years old, children incorporate intentions into their evaluations of someone's prosocial behavior but do not integrate intentions into their predictions of the recipient's emotional responses until 8-years-old. Regardless of age, children believed that altruistic prosocial intentions were associated with stronger social relationships and an increased desire to affiliate. However, only 8- and 9-year-olds used these intentions to predict future behavior and guide their own behavior. Thus it seems that children's evaluations demonstrate the out-to-intention shift previously seen in children's moral judgments of accidental compared to intentional harm and helping (Cushman et al., 2013; Margoni & Surian, 2017). Interestingly, it seems children of all ages utilize prosocial intentions and their use of the intentions becomes more complex as they age.

The present results are the first to show that 8- and 9-year-old children differentiated altruistic from egoistic prosocial intentions when thinking about others' emotional responses. The younger ages justifications relied primarily on outcomes to determine the recipient's emotional response and subsequently thought individuals would feel positive regardless of intentions. On the other hand, as adults have been found to do, 8- and 9-year-olds understood that recipients of prosocial behaviors motivated by concern were more likely to feel positive emotions whereas recipients of prosocial behavior

motivated by a desire for reciprocity were more likely to experience negative emotions (Peng et al., 2017; Tsang, 2007; Tsang, 2006). Interestingly, 8- and 9-year-olds predicted that the recipient of reciprocity-motivated prosocial behavior would feel more mixed emotional states (i.e., "both happy and unhappy") rather than primarily positive or negative emotional states.

While only the older age group demonstrated a statistically significant difference in the predicted emotional responses for the recipient, we recognize that the trichotomous variable of "just happy," "just unhappy," or "both happy and unhappy" may have not been sensitive to notice differences in 4- and 5-year-olds' emotional state. Although the youngest age group primarily endorsed positive emotions (i.e., "just happy"), there may have been differences in the amount of positive emotion the 4- and 5-year-olds predicted for the recipient in response. In addition, children's use of mixed emotional states in the study parallels the development of children's ability to understand that a person may have multiple or contradictory emotional responses, which develops around 8 years of age. (Larsen et al., 2007; Pons et al., 2004). In the moral domain, our results are consistent with research on the "happy victimizer" effect, where younger children believe harming others to achieve a goal will result in positive emotional outcomes, and children around eight years of age are more likely to endorse mixed emotional states (Arsenio & Kramer, 1992). Future studies may benefit from a more nuanced emotional scale to better understand young children's assessment of the recipient's emotional responses. For example, researchers may first ask the child about the emotional valence (happy or unhappy), then ask the child to indicate the amount of a given emotion on a five-point scale (see Beeler-Duden & Vaish, 2020).

In adult literature, prosocial behavior motivated by a desire for reciprocity increases negative emotions and a desire to return the favor (Peng et al., 2017; Tsang, 2007; Tsang, 2006). Surprisingly, none of the children in our sample thought that the recipient of prosocial behavior would feel obligated to share resources with the Egoistic prosocial agent. On the contrary, older children were more likely to believe that the recipient of the prosocial behavior should share resources with the Altruistic prosocial agent. These results are consistent with other work showing that children share more resources with partners to reward them for acting cooperatively (Fehr et al., 2008; Oostenbroek & Vaish, 2019; Vaish et al., 2011). Additionally, children believe that others should share more resources with friends and those with whom they desire to affiliate (Lieberman & Shaw, 2017; Olson & Spelke, 2008). Children's *positive reciprocity* suggests that they may think Kylie wants to invest in her relationship with the Altruistic prosocial agent or reward the Altruistic prosocial agent's favorable intentions behind their (McCabe et al., 2003). Since the experimenter asked the children to evaluate the prosocial agents before answering the forced-choice questions, the structure of the current study may have influenced the children's response to this question. More research should be conducted to understand this unexpected finding better.

Moreover, the current study also suggests that children around eight years of age distinguish and use the same intentions that underly feelings of gratitude and indebtedness to inform their understanding of others' emotional responses (Peng et al., 2017; Tsang, 2007; Tsang, 2006). There is evidence that as young as four years old, children's own prosocial behavior is potentially motivated by a gratitude-like mechanism (Beeler-Duden & Vaish, 2020). It remains unknown whether children experience feelings

of indebtedness and how intentions may inform children's own emotional responses. Further research should be conducted to understand better how sensitive children's behavior and emotional reactions are to the intentions of those who act prosocially toward them.

Our results complement previous work demonstrating that children make use of prosocial intentions. Notably, the current study finds that children, at least in the population tested, can distinguish not only accidental and intentional prosocial behavior but also more complex, nuanced, and information-laden prosocial intentions. Extending the work of Margoni and Surian, this study showed that children's moral judgments exhibit the same "outcome-to-intention" shift for the prosocial motivations of concern for another's welfare and desire for reciprocity, such that children's evaluations are sensitive to more nuanced intentions of an individual's prosocial behavior by six years of age (2017). These results indicate that children, at least in our sampled population, are considering whether an individual's actions were intentional and whether those motivations are morally acceptable.

An important open question concerns the mechanisms underlying the understanding and use of intention information. Researchers have debated the mechanisms underlying the developmental effect seen here and in other studies investigating children's use of intention information in the moral evaluation of both harm and help. The researchers put forth two potential mechanisms: theory of mind and the developmental constraint models. Theory of mind refers to the children's ability to understand other people and attribute mental states (e.g., intentions, desires, emotions, etc.) to them (Cushman et al., 2013). According to the theory of mind model, as

children's abilities to attribute mental states to others increases, so does their use of intentions in both their moral evaluations and desire to reward or punish the agent (Killen et al., 2011; Smetana et al., 2012).

On the contrary, the developmental constraint model hypothesizes that intent-based judgments develop first, constraining children's desire to punish or reward an individual due to a developmental change in the concept of what is morally right or wrong (Cushman et al., 2013; Margoni & Surian, 2017). Although not directly tested, the fact that 6- and 7-year-olds as well as 8- and 9-year-olds' considered the intentions in their evaluations of the prosocial behavior, but only 8- and 9-year-olds thought the Altruistic prosocial agent should receive the "reward" of sharing a resource and used intentions to inform their prediction of the recipient's emotional reaction may lend support to the developmental constraint model. According to the developmental constraint model, 6- and 7-year-old children first understood that acting out of egoistic motivations was morally unacceptable, then 8- and 9-year-olds used those moral evaluations to make predictions about the recipient's emotional state and desire to reward the prosocial agent. Future research should include failed attempts to help in addition to the manipulations here to clarify how intention-based moral judgments are truly influencing these developmental changes. For example, younger children may think that someone feels less positive emotions and evaluates the prosocial agent more negatively if the prosocial agent fails to be prosocial with egoistic intentions, like a desire for reciprocity. By including failed attempts to be prosocial, the study could further explain children's responses to egoistic and altruistic prosocial intentions, as the agent's intentions would no longer be connected to the positive prosocial outcomes. Therefore,

the distinct roles outcomes and intentions play in children's evaluations and predictions could be understood.

One significant limitation of our study concerns the study sample. The current study examined primarily children from households with highly educated and affluent parents from a large-scale industrialized society. There is emerging evidence that the role intentions play in moral judgments is not universal; instead, there is substantial cross-cultural variation in the importance placed on intentions (Barrett et al., 2016a; Saxe, 2016). Given this variation and our results that intentions inform social relationship understanding before moral judgments, it would be interesting to test the generalizability of the present results to other societies.

As discussed previously, adults recognize that the motivations of concern for another's welfare are symbolic of a Communal sharing relationship model (Fiske, 1992). At the same time, a desire for reciprocity is associated with an Equality matching relationship model (Fiske, 1992). This study is the first to demonstrate that children use intention information to understand the relationship between individuals. As predicted by the Communal sharing relationship, children thought the recipient would have a desire to affiliate and a closer relationship with an individual who acts out of concern for their welfare, rather than a desire for reciprocity. Interestingly, these effects were seen not just in the older age groups, whose evaluations were sensitive to intentions, but across all age groups. So, it seems that even 4- and 5-year-olds understand and may make use of intention information to inform their understanding of others' relationships.

Thus, an important limitation of the current study is that the study measures children's expectations and evaluations for a nonspecific relationship between prosocial

agents and recipients. For adults, the individuals involved and the relationship between them impacts whether different types of actions are considered wrong (Earp et al., 2021b; Simpson et al., 2016; Sunar et al., 2021). Moreover, adults form and update moral impressions based on social relationships and particular social roles (Crockett et al., 2021). For example, adults think walking away from someone crying is more of a violation if the individuals are in a Communal sharing relationship rather than an Equality matching relationship (Fiske, 1992). In the current study, children seem to be thinking about the social behavior and relationships between the prosocial agent and the recipient. Children in our study may have preconceptions about the relationship between the two characters (e.g., assume, in the absence of any other information, that the agents and recipient are in Communal relationships), which in turn may have dictated the children's predictions about the recipient's emotions and prosocial agent evaluations. Further research should explore how children use the relationships between individuals to determine what is morally acceptable or praiseworthy.

Overall, the present study shows that as children age, they evaluate the outcome of prosocial behavior and consider one's intention behind the behavior. Importantly, we showed for the first time that older school-aged children incorporate nuanced intentions, not just whether an action was accidental or intentional, into their moral judgments and predictions of others' behavior. Additionally, regardless of age, all children used intentions to make predictions about the social relationships between the prosocial agents and the recipient. Thus, children seem to understand and use an individual's intentions from an early age, which are crucial for helping humans understand and navigate their social world. This crucial skill allows individuals to choose reliable and trustworthy



future partners, facilitating the establishment of positive, cooperative relationships. The ability to distinguish and make use of intentions likely works alongside and interacts with other skills to foster early prosociality and contributes vitally to human group living and cooperation.

#### Chapter 4

Humans are inordinately prosocial beings that act in big and small ways to benefit others and form cooperative relationships, often at a cost to themselves (Tomasello, 2016). Through these cooperative relationships, early humans could achieve goals that were difficult to accomplish independently (Tomasello, 2009). Importantly, large-scale cooperative societies consist not only of intimate “strong” ties such as kin and friends but also weak ties, where there is no prior contact or connections may be less well established (e.g., strangers, acquaintances, etc.; Granovetter, 1973; Tomasello, 2016). This propensity to form collaborative relationships with kin and non-kin led to the evolutionary success of our species (Tomasello, 2016). Our evolutionary success required humans to extend cooperation beyond repeated encounters and establish cooperative relationships to new encounters and new cooperative relationships (Boyd & Richerson, 1989; van den Berghe & Alexander, 1988).

Given that an individual often incurs a cost (e.g., time, resources, energy, etc.) to gain the future benefits associated with this cooperative relationship, establishing a new cooperative relationship can be a risky endeavor (Bartlett & DeSteno, 2006; Krakauer, 2011; Nowak, 2006). The new potential partner may not reciprocate, leaving the prosocial individual without valuable resources or a means to gain new ones. This risk is inherent in all new cooperative relationships with no prior contact or where connections

may be less well established, as information about that potential partner is limited. New cooperative relationships require an individual to accept this risk based on the prediction of a positive result from another's actions, in other words, demonstrating trust (Borum, 2010). If a potential partner is deemed too risky, an individual may not enter into the cooperative relationship (Lopes, 1994). Thus, a critical social task we face is to identify reliable and trustworthy cooperative partners who will be prosocial towards us in the future. How do we solve this problem and mitigate the risks associated with new cooperative partnerships?

Information about potential cooperative partners is limited, so individuals must rely on their potential partner's previous cooperative behavior to evaluate and make predictions about their future behavior (Hamlin, 2013). Adults readily use an individual's past behavior when navigating their social world and choosing cooperative partners. Choosing to help someone, refusing to do so, or violating social norms impacts an individual's reputation and the prosocial behavior they receive (Balafoutas et al., 2014; Blain et al., 2022; Wedekind & Milinski, 2000). For adults, a potential partner's past behavior can influence whether an individual thinks the potential partner is trustworthy and cooperative behavior is less risky (Delgado et al., 2005; Lacour, 2012; McCabe et al., 2003). From early in development, the capacity to understand and use an individual's past cooperative behavior influences whether children choose that individual as a social partner (Li et al., 2020; Olson & Spelke, 2008; Vaish et al., 2010). An individual's past cooperative behavior influences young children's social preferences, as well as their predictions of others' preferred social partners (Cowell & Decety, 2015; Hamlin et al., 2007; Hamlin & Wynn, 2011; Henderson & Woodward, 2011; Kuhlmeier et al., 2003;

Premack & Premack, 1997; Van de Vondervoort & Hamlin, 2017, 2018). Thus, children and adults use others' past prosocial behavior to form positive and negative impressions of other people's social acts that subsequently guide their understanding of and desire to develop new relationships.

It is not enough to use the consequences of individuals' prior actions but rather to make more accurate predictions about new cooperative partners. Many potential factors can motivate an individual's prosocial actions (e.g., the desire for reciprocity, reputational benefits, concern for others' welfare, etc.), so without taking internal states into account, it would be difficult to judge an individual or their behavior accurately (Eisenberg et al., 2016). Thus, identifying reliable cooperative partners requires observing and evaluating whether our potential partners possess the right motivations for acting prosocially. When navigating their social world, adults readily consider the *mental states* that drove an individual to act, not just the outcome of their actions (Cushman, 2008; Falk & Fischbacher, 2006; McCabe et al., 2003). Adults' moral judgments and decisions to reward or punish rely on the individual's intentions (Cushman, 2008; Cushman et al., 2013; Killen & Smetana, 2008; Young et al., 2007). The intentions underlying an individual's actions also greatly influence adults' emotions, behaviors, and evaluations (Mathews & Green, 2010; Peng et al., 2017; Tsang, 2006). Individuals experience more positive emotions, evaluate the prosocial individual more positively, and have a stronger desire to affiliate with a prosocial partner who acted out of concern rather than a desire for reciprocity (Greenberg & Shapiro, 1971; Peng et al., 2017; Tsang, 2006). There is increasing evidence that the intentions of others also act as an essential guide for adults' trust and trustworthy behaviors (Dufwenberg & Kirchsteiger, 2004; Falk

& Fischbacher, 2006; Johnson & Mislin, 2011; Lacour, 2012; McCabe et al., 2003). For example, adults' trust and trustworthy behaviors increase when a potential partner's intentions indicate that they want to invest in the relationship (McCabe et al., 2003). So, adults incorporate an individual's intentions into their evaluations, and types of intentions can motivate distinct social, emotional, and behavioral responses.

There is evidence that children use intentions to understand and navigate their social world. Preschool-aged children understand intentions and use this information to guide their social behavior. They share more and prefer to interact with those who are intentionally prosocial rather than accidentally (Vaish et al., 2018; Woo et al., 2017). Young children primarily rely on the outcomes associated with the behavior when evaluating others, but as children age, they increasingly incorporate actors' intentions into their judgments and behavior (Cushman et al., 2013). Between five to six years of age, children's moral judgments and the consequences of those judgments (i.e., punishment or reward) begin to incorporate whether someone's actions were intentional or accidental (Cushman et al., 2013; Margoni & Surian, 2017). These studies indicate that children understand whether an action was accidental or intentional and use that information to guide their own behavior.

In Chapter 3 of the current dissertation, I found that, like adults, children can understand and use others' altruistic or egoistic prosocial behavior motivations. When hearing prosocial stories, children could distinguish between a prosocial partner acting out of concern for the individual (i.e., altruistic intentions) or a desire for reciprocity (i.e., egoistic intentions). Specifically, 6- to 9-year-olds evaluated the altruistic prosocial partner more positively than the egoistic prosocial partner. However, only 8- and 9-year-

olds thought the recipient of the prosocial behavior would experience more negative emotions and themselves utilized the intention information to make predictions about the prosocial partners' future prosocial behavior. Interestingly, all children understood that intentions were associated with social relationships, such that 4- to 9-year-olds believed that the recipient had a stronger desire to affiliate with and closer relationship with the altruistic prosocial partner. It seems that children, from a young age, can understand the nuanced social information associated with an individual's intentions. While older children use it to inform their evaluations, expected emotional reactions, and behavioral predictions, young children still appear to understand that the intentions behind prosocial actions provide vital social information. These results suggest that young children discriminate altruistic intentions from egoistic intentions and use this information to draw conclusions and make predictions about others.

As discussed above, cooperation is risky but building new cooperative relationships carries greater risk because less is known about the individual. Intentions can provide important information about *novel* cooperative partners and increase the accuracy of an individual's predictions about cooperative partners (Cushman, 2008; Falk & Fischbacher, 2006). Individuals may not form a new cooperative relationship if it is too risky but accurate predictions reduce the perceived risk and motivate cooperation (Lopes, 1994; Ng & Au, 2016). Children seem to be using altruistic and egoistic intentions to make predictions about others' future behavior. Still, less is known about how these predictions influence their trust and how children use this information to guide their own cooperative behavior.

Trust is thought to develop in infancy, and once established, trust affects an individual's thoughts and behavior across the lifespan (Armsden & Greenberg, 1987; Erikson, 1964). Trust also plays a vital role in children's social relationships and with whom they choose to affiliate (Bernath & Feshbach, 1995; Bornstein et al., 2003; Harris, 2007). Trust requires that one party decides to take a risk and predicts that the other individual will provide a positive result (i.e., trusting behavior). The other individual then elects to produce the positive outcome one has been entrusted to make (i.e., trustworthy behavior). Beginning at four years of age, children exhibit trusting behaviors by investing more in others when reciprocation is possible. As they age, children invest more in trustworthy partners that divide the resources evenly than in untrustworthy partners that keep the resources for themselves (Rosati et al., 2019). Young children also consistently display trustworthy behavior. For example, 5- to 8-year-old children share more resources when their allotment was contingent on another's investment than when it was not (Amir et al., 2021). Children's trust is sensitive to many characteristics of the other individual and their actions, such that children track an individual's past behavior and rely on those who were consistently reliable in the past (Harris, 2007; Harris & Corriveau, 2011; Kinzler et al., 2011). These results suggest that children understand and engage in trusting and trustworthy behavior from an early age, and this understanding becomes more sophisticated with age.

While we know that children readily trust others and demonstrate trustworthy behavior, less is known about whether children use others' intentions when deciding to trust. Children, from a young age, can understand the nuanced social information associated with an individual's intentions. It remains unclear how children use these

intentions to guide their own behavior and whether children's trust in the individual's future prosocial behavior is impacted. Thus, the present study aims to understand whether children incorporate others' intentions into their trust and trustworthy behaviors, as well as into their predictions of a potential partner's future prosocial behavior.

In this within-subjects study, 4- to 9-year-old children played a Trust Game with two prosocial partners, one of whom acted with altruistic intentions and the other with egoistic intentions. In the Trust Game, a player (Trustor) is given several resources, which they can choose to transfer to a second player. The number of resources transferred is thought to measure the player's trust in or prediction of the second player's prosocial behavior. The transferred resources are then increased such that the second player (Trustee) has a larger allotment, and the second player then can decide whether and how much of the allotment to transfer back to the first player. The number of resources transferred back is thought to measure the player's trustworthy behavior and desire to reciprocate the initial prosocial behavior.

To assess how altruistic and egoistic intentions impacted children's trust and trustworthy behaviors, children played two Trust Games with each agent, one as the Trustor and the other as the Trustee. While playing the Trust Games, children answered questions about their emotional responses and evaluations of the prosocial partners' actions. Once the children played two Trust Games with both prosocial partners, they answered a series of forced-choice questions to assess their predictions and evaluations of the prosocial partners. Since trust incorporates children's willingness to take a cooperative risk as well as their prediction of another's prosocial behavior, children provided an additional prediction of prosocial partners' cooperative behavior that was not

contingent on the child's behavior; this allowed us to tease the risk and prediction components apart.

We hypothesize that, children's sensitivity to the intentions underlying an individual's prosocial actions will increase with age. Children will consistently distinguish altruistic and egoistic intentions by six years old and incorporate intentions into their emotions and evaluations of prosocial partners. Moreover, children's trustworthy behavior most likely will be driven by positive reciprocity causing them to reward the Altruistic prosocial agent, but a sense of indebtedness may also motivate them to share more resources with the Egoistic prosocial agent. We hypothesize that as children age, they will also use these intentions to guide their trusting behaviors, such that they may share more with the Altruistic prosocial partner in the second Trust Game. With age, these intentions will influence children's desire to affiliate and their predictions of the prosocial partners' future cooperative behavior, such that they predict the Altruistic prosocial partner will be more cooperative in the future.

## **Methods**

### **Participants**

The study was within-subjects with two counterbalanced Protagonists: Altruistic or Selfish. Our planned sample size was based on a power analysis using R, with an effect size of 0.41, a power of 0.8, and an alpha of 0.05 (based on Beeler-Duden & Vaish, 2020); based on this analysis, we determined the planned sample size to be 60: 20 children in each age group. Participants were in the following age groups: 4- and 5-year-olds ( $n = 20$ ; 12 girls) between 48 months and 71 months ( $M = 62$  months, 2 days;  $SD = 196.24$  days), 6- and 7-year-olds ( $n = 20$ ; 10 girls) between 72 months and 95 months ( $M$



= 81 months, 27 days;  $SD = 213.67$  days), and 8- to 9-year-olds ( $n = 20$ ; 10 girls) between 96 months and 119 months ( $M = 108$  months, 25 days;  $SD = 215.13$  days). The sample was mostly highly educated and White (White = 58.4%, Asian = 18.3%, African American = 3.3%, Hispanic = 3.3%, more than one race = 16.7%). Thirteen additional participants were excluded from the analysis: three due to connectivity issues, two withdrew or did not complete the study, two failed the comprehension checks about the prosocial partner's intentions, two failed the "other player" comprehension checks, two due to a distracting environment, one due to experimenter error, and one due to the participant's parents interfering in the study procedure.

### **Setting**

The study was conducted synchronously online via Zoom. Children were primarily in their homes on either a computer or tablet. The experimenter requested that parents not use cell phones. The study used a computer game in which the child interacted with two computerized confederates (represented via animal avatars) described as other "little boys/girls" playing the game remotely. The experimenter used Zoom to record and transcribe verbal utterances. Children's behavioral responses were recorded by Python and verified with the videos.

## **Procedure**

### ***“Other Children” Comprehension Question***

After a brief introduction and warm-up with the child via Zoom, the researcher shared her computer screen so the child could view and participate in the game. The child was then informed that “today you will be playing a computer game with little boys/girls whom you don’t know” (gender-matched to the participant). The child was then asked two comprehension questions: “Do the other little boys/girls know who you are?” and “Do you know who the other little boys/girls are?”. If the child failed to provide an answer or answered the questions incorrectly, the above statement and question were repeated. If the child still did not answer or answered incorrectly, they were removed from the analyses.

### ***Trust Game Introduction***

Following the comprehension question, the child was introduced to components of the Trust Game. The child watched a visual representation, and the experimenter explained the steps of the Trust Game practice round between two players: a tiger and an elephant. The child was told that the trustor (tiger) went first and could decide to either keep or give the initial allotment (one token) to the other player (elephant). Children then saw both options visually represented. When the token was given to the other player, the experimenter told the child that the tiger could no longer decide what happened to the allotment. Once the initial allotment was given to the elephant, the allotment of one token “became more tokens.” The experimenter drew the child’s attention to the visual as the allotment became three tokens. Next, the experimenter told the child it was the elephant’s turn to decide what to do with “all the tokens,” emphasizing that the elephant could keep

them all or give some of the tokens to the tiger. Finally, the experimenter informed the child that once the elephant decided what to do with the allotment, that game ended, and the elephant would go first in the next round with the tiger.

### ***Token Machine Introduction***

After being familiarized with the steps of the Trust Game, E showed the child a virtual “token machine.” The token machine produced rewarding stimuli (e.g., images of attractive objects appear and move about on the screen) when tokens from the game were “inserted” into the machine. There were two types of tokens, stars and circles, which produced two types of rewarding stimuli, fireworks or raining cartoon objects (e.g., hotdogs, candy, etc.). The child watched an example of each type of token being used in the machine to produce a rewarding stimulus. The token machine served to make the Trust Game tokens more attractive and valuable for children.

### ***Animal Avatars***

Once the child viewed both examples of rewarding stimuli, they were shown four animal characters (a raccoon, penguin, rabbit, and bear; presented at the bottom of the screen in random order) and asked to choose the avatar that they would like to represent themselves for the remainder of the game. After the child had selected their avatar, an hourglass appeared as the first confederate child “chose” their avatar, either a giraffe or a zebra. In reality, there were no other players and the “other children’s” actions were pre-programmed.

### ***First Trust Game***

The child was introduced to the first prosocial partner in the Trust Game and then played two Trust Games with that agent. The procedure for the Trust Game was similar

regardless of the agent and their intentions. For the first Trust Game, the prosocial partner received the initial allotment of three tokens. After the experimenter had counted the number of tokens the prosocial partner had in the initial allotment, the prosocial partner sent a message to the child via a blue message bubble, which the experimenter read to the child. The messages for each prosocial partner were as follows:

*Egoistic intention message:* “I help others because I really want them to give me things. I am giving you these tokens because I want you to give me things later when I want them.”

*Altruistic intention message:* “I help others because I really care about them and want to help them. I am giving you these tokens because I care about you and want to help you.”

The experimenter then asked the child a comprehension question to verify the child understood the prosocial partner’s intentions. If the child failed to provide an answer or answered the questions incorrectly, the intention statement and comprehension question were repeated. If the child still did not answer or answered incorrectly, they were removed from the analyses. The prosocial partner then gave two of the three tokens to the child.

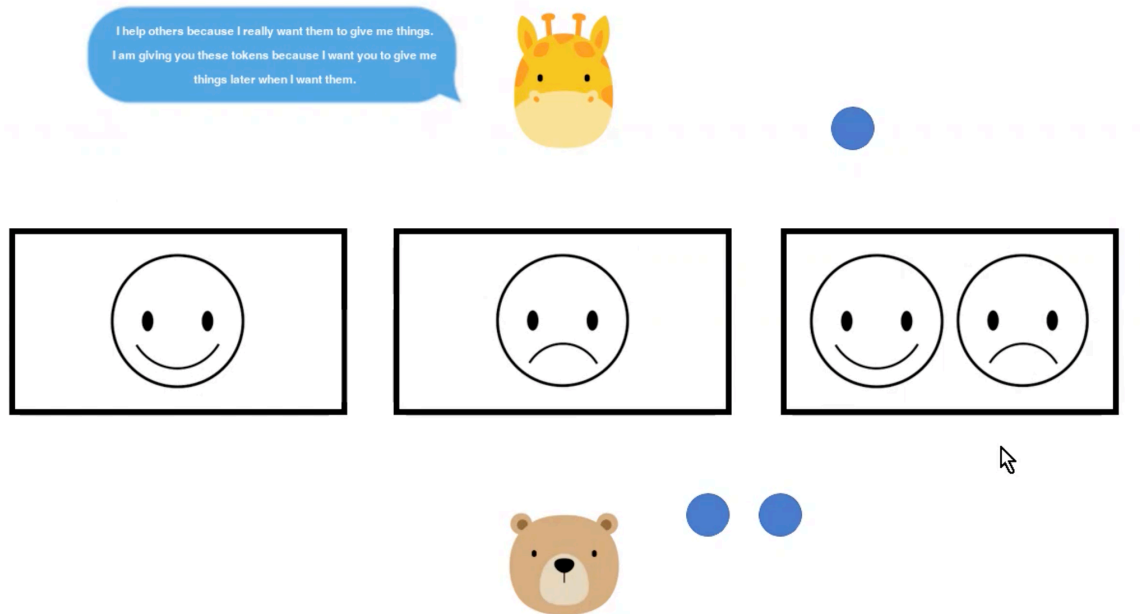
### ***Emotional Response***

After the prosocial partner distributed the initial allotment, the experimenter asked the child how Kylie felt the about prosocial partner after he/she shared. For example, “How do you feel right now? Do you feel just happy, just unhappy, or both happy and unhappy?” The child selected from three predetermined choices with corresponding pictural representations: “Just happy,” “Just unhappy,” or “Both happy and unhappy” (see Figure 25). After selecting a response, the child was asked to provide a justification for the chosen emotional state (e.g., “Why do you feel just happy?”). If the child did not

respond, the experimenter prompted the child by saying, “There is no right or wrong answer,” and repeated the question. If the child did not provide a justification, the experimenter proceeded with the study.

### Figure 25

*The Visuals used to Represent children’s Emotion Response Choices. Children Selected Between “Just happy,” “Just unhappy,” or “Both happy and unhappy”*



### *Trustee Role in Trust Game*

Next, the tokens the prosocial partner shared with the child increased from two to five, and it was the child’s turn to distribute their allotment. The experimenter told the child that they could keep all the tokens if they wanted, or they could give any of the tokens to the other little boy/girl by saying the name of the other little boy/girl’s animal avatar (i.e., zebra or giraffe). The experimenter also conveyed to the child that the prosocial partner could not see their decision, and the prosocial partner’s avatar closed its eyes to represent this physically. As a check of comprehension, the experimenter then

asked the child if the prosocial partner could see their distribution. If the child failed to provide an answer or answered the questions incorrectly, the experimenter repeated the statement, and the comprehension question was repeated. If the child still did not answer or answered incorrectly, they were removed from the analyses.

The experimenter told the child it was their decision and that they would make the tokens go wherever the child decided. The experimenter then asked the child to whom they would like to give the first token. The child then used the animal names to choose who should receive the token. After the first token, the experimenter asked the child how they would like to distribute each token by prompting the child with, “What about this token?”. Once the child had distributed all the tokens, the tokens they kept for themselves were used in the token machine.

### ***Token Machine***

The tokens the child kept for themselves appeared to the left of their avatar, and the token machine appeared in the center of the screen. The experimenter asked the child which token they would like to use in the token machine. Once the child selected a token, the token was sent into the machine, causing a rewarding stimulus to appear, such as fireworks or cascading 8-bit images. The presentation order of the rewarding stimuli was randomized for each child, and the rewarding stimuli did not repeat within the study. The child continued to select the next token to send into the token machine until all their own tokens had been used.

### ***Trustor Role in Trust Game***

The child then played another Trust Game with the same prosocial partner. In this Trust Game, the child was the Trustor and thus had the first turn. The child received the

initial allotment of three tokens and was told they could distribute the tokens however they would like, and the experimenter would give the token to whomever they chose. The experimenter distributed the tokens individually, according to the child's direction. The tokens the child shared with the prosocial partner increased to an odd amount proportional to the amount the child shared (i.e., one became 3, 2 became 5, and 3 became 7).

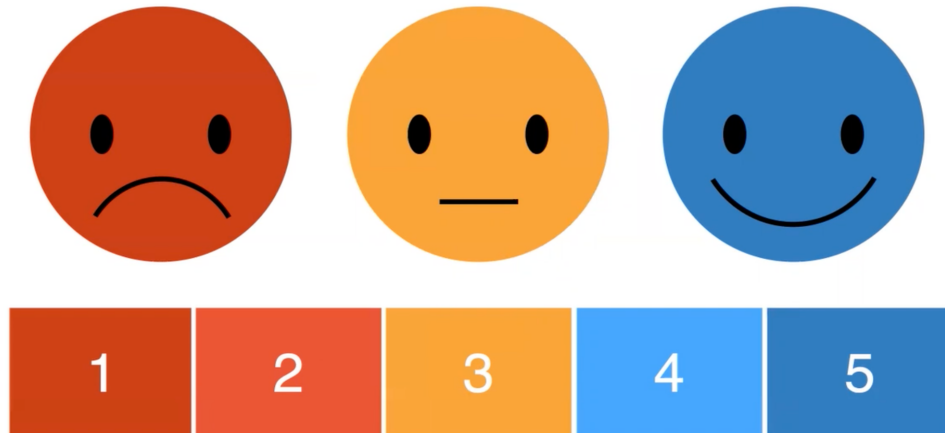
The experimenter then told the child it was the prosocial partner's turn to decide what to do with their tokens. A white screen hid the Trust Game, and a timer appeared. Once the prosocial partner "made her/his decision," the child and prosocial partner's avatars reappeared. The experimenter reminded the child how many tokens they had kept. Then, a box appeared, which the experimenter told the child held the tokens the prosocial partner had given them. The experimenter told the child that the box would be opened at the end of the game.

### ***Character Evaluation***

After both Trust Games with the first prosocial partner, the experimenter introduced the child to the 5-point character evaluation scale, which consisted of a series of smiling and frowning faces (see Figure 26). The scale ranged from 1 to 5 and was accompanied by verbal character evaluations (really bad, a little bad, just okay, a little good, really good). The experimenter asked the child to evaluate the prosocial partner using the character evaluation scale (e.g., "How bad or good is the zebra?"). The experimenter read all the answer choices to the child. The child then rated the agent on the 5-point Likert scale and gave the experimenter a verbal response.

**Figure 26**

*The Series of Smiling and Frowning Faces used to Evaluate the Prosocial Partner*



After the child provided a rating, the experimenter asked the child an open-ended justification question (e.g., “Why do you think the zebra is really good?”). If the child did not provide a response, the experimenter prompted the child by saying, “There is no right or wrong answer. What do you think?” If the child still did not provide a justification, the study proceeded. If the child provided a justification, the experimenter did not provide any feedback on the content of their responses. After providing the character evaluation for the first prosocial partner, the child then played two Trust Games with the second prosocial partner, where the child again acted as both the trustor and the trustee.

### ***Forced-choice Test Questions***

After the child played all four Trust Games, selected their emotional reactions, and provided character evaluations for both prosocial partners, the experimenter told the child that she had some questions for them about the two agents. First, the experimenter reread the prosocial partners’ messages to remind the child of the agents’ motivations for



their actions. Children were then asked the following test questions (adapted from Vaish et al., 2011):

1. If you played a different game, whom would you rather play with, the zebra or the giraffe?
  - a. “Why would you rather play a different game with \_\_\_\_?”
2. “Who do you think is nicer, the zebra or the giraffe?”
  - a. “Why do you think the \_\_\_\_ is nicer?”
3. “If you fell over, who do you think would NOT help you, the zebra or the giraffe?”
  - a. “Why would he/she not help you?”
4. “If you needed someone to help, would you ask the zebra or the giraffe?”
  - a. “Why would you ask him/her for help?”
5. “Who cares more about himself/herself, the zebra or the giraffe?”
  - a. “Why does he/she care more about himself/herself?”

Questions 1-5 were forced-choice questions designed to assess whether children incorporated intentions, their understanding of the characters, and predictions of future behavior when presented with the choice. Question 1 estimated how children used intention information when thinking about whom they would like to affiliate with. Question 2 was meant to further provide a further assessment of children’s character evaluations. Question 3 investigated how children might use intention information to predict future prosocial behavior. Question 4 probed how children might use intention information to guide their own behavior. Question 5 assessed whether children indeed interpreted the prosocial partner’s desire for reciprocity as a selfish motivation.

In answering the forced-choice questions, children were expected to name and point to one of the prosocial partners. If a child responded with “Both” or “Neither,” the experimenter encouraged the child to choose one. If a child did not respond, the

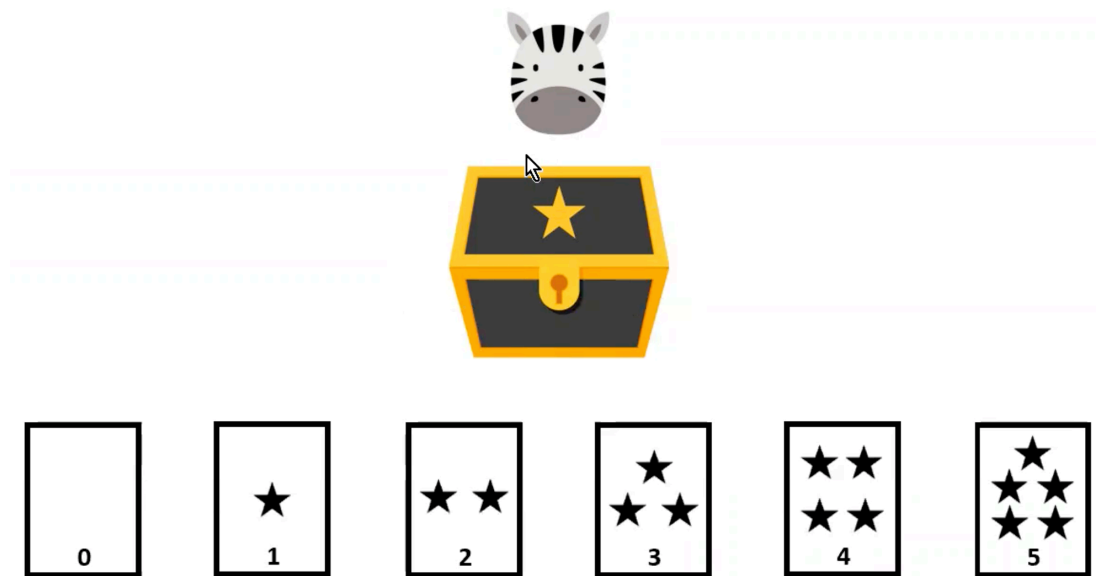
experimenter repeated the question, but if the child did not respond, the experimenter moved on to the next question. Questions 1.1–5.1 were open-ended questions meant to elicit justifications for children’s responses to the forced-choice questions. If the child did not respond, the experimenter prompted the child by saying, “There is no right or wrong answer. What do you think?” If the child did not provide a justification, the experimenter proceeded with the study. When the child provided a justification, the experimenter did not provide any feedback on the content of their response.

### ***Prosocial Partner Prediction***

After answering the forced-choice questions and providing their justifications, the first prosocial partner that children played the Trust Game with reappeared at the center top of the screen. The box with the tokens given by this prosocial partner in the second Trust Game then also appeared on the screen (below the prosocial partner). The experimenter reminded the child that the box contained the tokens the prosocial partner gave them in the second Trust Game. The experimenter then asked the child how many tokens they thought were in the box; this assessed their prediction of the agent’s generosity or cooperativeness. Visual representations appeared on the screen representing the number of tokens in the box, ranging from zero to five (see Figure 27). The experimenter then read the potential options to the child while gesturing at the options with the mouse cursor, and the child was asked to select one of the options. If the child did not provide a response, the experimenter prompted the child by saying, “There is no right or wrong answer. What do you think?” and then repeated the numerical options and gestures. If the child still did not answer or answered incorrectly, they were removed from the analyses. This process was repeated for the other prosocial partner.

**Figure 27**

*The Box and Choice Options for Children's Predictions of the Prosocial Partner's Sharing*



### ***Counterbalancing and Randomization***

Children in each age group were randomly assigned to one of 4 presentation orders, which counterbalanced the following: which prosocial partner appeared first and which avatar represented the Altruistic prosocial partner or Egoistic prosocial partner. The order of the test questions and the location of the prosocial partners' avatars (left or right) was pre-programmed to be randomized across children.

### ***Coding and Reliability***

The primary coder (the author) used the video recording of the participants to code whether children responded correctly to the comprehension questions and responded as hypothesized to the forced-choice test questions. Forced-choice responses were scored 1 if they were consistent with the hypotheses that children should (a) prefer to play a new

game with the Altruistic prosocial partner, (b) think the Altruistic prosocial partner is nicer than the Egoistic prosocial partner, (c) think the Egoistic prosocial partner is less likely to help in the future, (d) prefer to ask the Altruistic prosocial partner for help, (e) and think the Egoistic prosocial partner cares more about themselves; responses not consistent with these hypotheses were scored 0. A second coder (unaware of condition and hypotheses) coded a randomly selected 50% of the sample from the videos for comprehension questions and forced-choice test questions. Reliability was perfect for all measures (all  $\kappa$ s = 1.00).

Additionally, the primary coder used transcripts and video recordings to code the children's justifications for emotional responses, character evaluations, and forced-choice questions. Each justification was assigned a score of 0, 1, or 2 (see Table 6 for details of the coding scheme). Justifications were assigned a score of 1 if they referenced the prosocial partner's actions or outcome. Justifications were assigned a score of 2 if they indicated relevant and sophisticated reasoning about the prosocial partner and their intentions, including justifications that referred to their motivations or involved the prosocial partner's moral character (e.g., "Because she does things for other people, but she still always wants things in return" or "she is good and nice because she helps people"). All other justifications were assigned a 0, including children's own preference for a given animal, unintelligible, irrelevant justifications, or not providing a justification. A second coder (unaware of the hypotheses) coded justifications of a random 25% of children for each question type. Reliability was perfect (all  $\kappa$ s = 1.00).

**Table 6**  
*Coding Scheme for Justifications*

Score	Category	Content
2	Motivations	References the prosocial partner's motives for their actions; for example, "he wants things for himself"
	Moral character or norms	Prosocial partner is a good (or bad) person or prosocial partner broke (or did not break) a moral norm; for example, "because you are not supposed to ask for things when you do something nice." or "she is kind because she wants to help me"
1	Action	Prosocial partner helped or shared; for example, "Because I have two tokens"
	Outcome	Consequences of the prosocial partner's actions; for example, "Because she gave me tokens"
0	Other, irrelevant, or uncodable	Response could not be put into any of the above categories, was irrelevant, or could not be coded

## Results

As preliminary analyses revealed no gender effects, gender was not included in further analyses. Nonparametric analyses were required as the data were not normally distributed. All reported  $p$ -values are two-tailed. A series of analyses were conducted to investigate how intentions influenced children's behaviors and responses toward the prosocial agents. When available, children's justifications for their responses and behaviors were compared within and across age groups.

The general structure for the analyses were as follows. First, a series of Wilcoxon Signed-Rank tests were used to compare whether the number of tokens shared with each prosocial partner differed within each age group. Next, Wilcoxon Signed-Rank analyses were conducted between age groups to evaluate whether children had different emotional responses to the prosocial behavior based on the partners' intentions. Following these analyses, Wilcoxon Signed-Rank tests were conducted to compare whether intentions

influenced children's trust in their prosocial partners as measured by the number of tokens shared in the second Trust Game. After, analyses were conducted to compare whether children answered the forced-choice questions in the hypothesized direction and whether these responses differed across age groups. Children's evaluations of the prosocial partners were compared with a series of Wilcoxon Signed-Rank analyses. As a final measure of the children's predictions of the partners' prosociality, Wilcoxon Signed-Rank tests were used to assess whether the number of tokens children believed the prosocial partners put in the box differed based on the intentions of the prosocial agent.

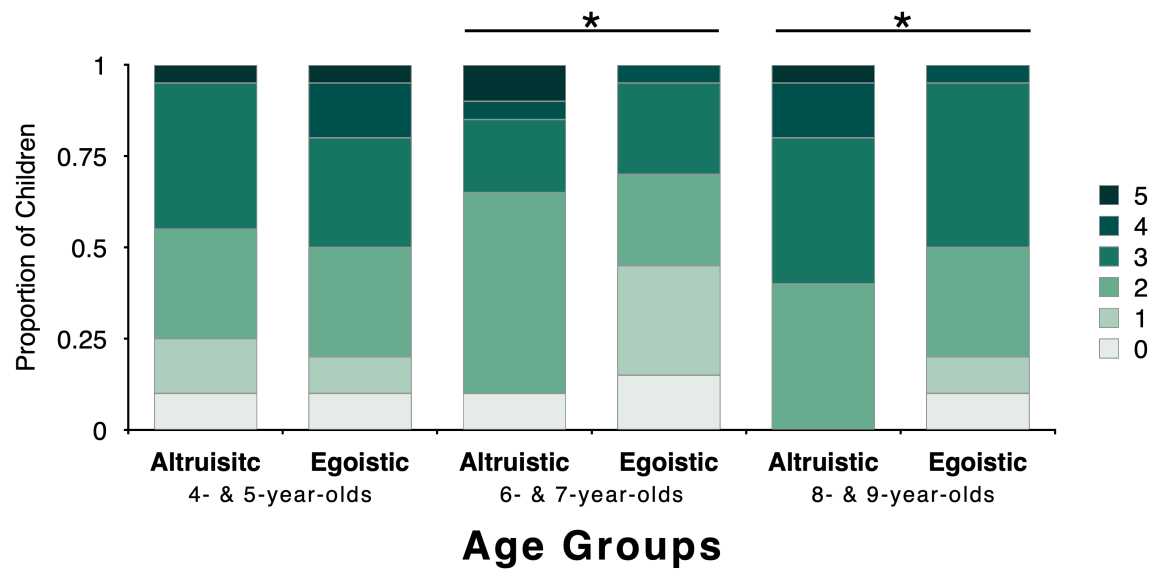
### **Trustee Role and Distribution of Resources**

In the first Trust Game, after the prosocial partner shared 2 of their initial allotment of 3 tokens, children were then in the trustee role and could give up to 5 tokens to the agent. These data were not normally distributed; therefore, a nonparametric test was used. The proportion of children in each age group that shared a given number of tokens with the Egoistic and Altruistic prosocial partners is represented in Figure 28. A series of Wilcoxon Signed-Rank tests were conducted to assess whether children in each age group differed in the number of tokens shared with the Egoistic versus Altruistic agent. The 4- and 5-year-olds' token distributions to the Altruistic prosocial partner ( $M = 2.45$ ,  $SD = 1.32$ ) and Egoistic prosocial partner ( $M = 2.2$ ,  $SD = 1.2$ ) were not significantly different ( $z = .00$ ,  $p = 1$ ). However, the 6- and 7-year-olds' token distributions demonstrated a significant difference in the tokens shared with the Egoistic versus the Altruistic agent. On average, children shared more resources with the Altruistic prosocial partner ( $M = 2.4$ ,  $SD = 1.27$ ) compared to the prosocial partner ( $M = 1.75$ ,  $SD = 1.16$ ;  $z = -2.11$ ,  $p = .035$ ). Likewise, 8- and 9-year-olds' distributed more

tokens to the Altruistic prosocial partner ( $M = 2.85, SD = .88$ ) compared to the Egoistic prosocial partner ( $M = 2.25, SD = 1.07$ ) when they were the trustees in the first Trust Game, ( $z = -2.29, p = .022$ ).

### Figure 28

*The Proportion of Children in each Age Group who Chose to Share a Given Number of Tokens with each Prosocial Partner in Trustee Role (total  $N=60$ )*



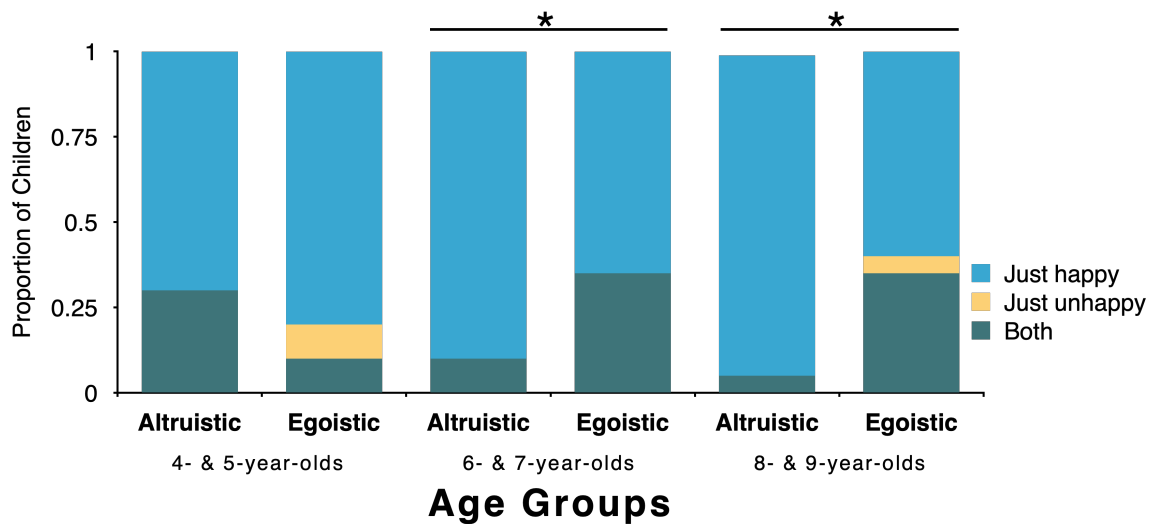
### Emotional Responses

Since the data of children's emotional responses were not normally distributed and within-subject, we conducted a series of Wilcoxon Signed-Rank tests to assess how children's emotional reactions differed after the Egoistic versus Altruistic prosocial partners shared resources with them in the first Trust Game. The proportion of children in each age group that chose a given emotional state is represented in Figure 29. The Wilcoxon Signed-Rank test indicated no difference in the 4- and 5-year-olds' emotional reactions to the Egoistic and Altruistic prosocial partners ( $z = -.787, p = .431$ ): most 4-5-year-old children reported feeling "just happy" in both cases. In contrast, 6- and 7-year-

olds were significantly more likely to feel “just happy” after the Altruistic prosocial partner shared tokens (90%, 18 of 20 children), whereas when the Egoistic prosocial partner shared the same number of tokens fewer children felt “just happy” (65%, 13 of 20 children) and some children felt “both happy and unhappy” (35%, 7 of 20 children;  $z = -2.24, p = .025$ ). Similarly, 8- and 9-year-old children were also more likely to feel “just happy” after receiving tokens from the Altruistic prosocial partner (95%, 19 of 20 children) than the Egoistic prosocial partner (60%, 12 of 20 children), with some children reporting feeling “both happy and unhappy” (35%, 7 of 20 children) after the Egoistic prosocial partner shared ( $z = -2.31, p = .021$ ).

### Figure 29

*The Proportion of Children in each Age Group who chose a Given Emotional Response to the Prosocial Partner’s Sharing (total N=60)*



### *Emotional Response Justifications*

Children’s justifications for their emotional responses after the prosocial partner shared in the first Trust Game were compared between the age groups. For all age groups, Wilcoxon Signed Rank test analyses comparing the type of justification given for



Altruistic or Egoistic prosocial partners revealed no statistical difference (all  $ps > .414$ ). Most children who provided a justification in these age groups referenced the actions or outcomes of a given prosocial partner's behavior (range 60% to 75%; see Table 7). Kruskal-Wallis analyses revealed no significant differences across age groups in the type of justifications for the emotional responses to the prosocial partners (all  $ps > .414$ ). All age groups primarily relied on the prosocial partners' actions when justifying their emotional responses.

**Table 7**

*Children's Justifications for Recipient Emotional Response*

Justification	4- and 5-year-olds		6- and 7-year-olds		8- and 9-year-olds	
	Altruistic	Egoistic	Altruistic	Egoistic	Altruistic	Egoistic
0	20% (4)	15% (3)	10% (2)	15% (3)	0% (0)	10% (2)
1	70% (14)	70% (14)	75% (15)	75% (15)	75% (15)	60% (12)
2	10% (2)	15% (3)	15% (3)	10% (2)	25% (5)	30% (6)

Note. The values represent the percentage of children (raw numbers in parentheses)

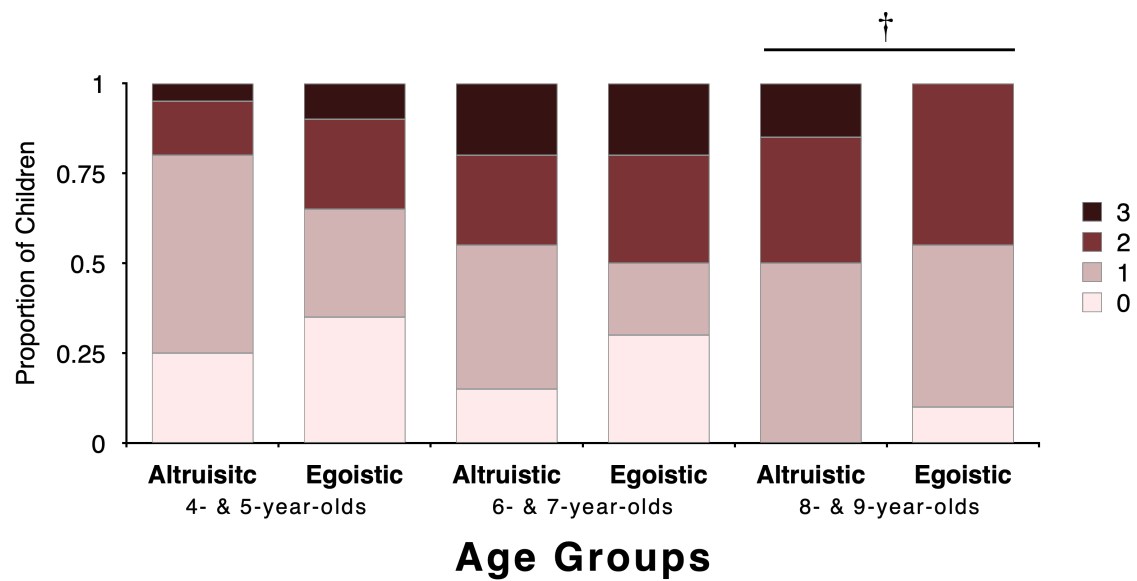
**Trustor Role and Distribution of Resources**

When the children were the trustors in the second Trust Game, they received the initial allotment and could share up to three tokens. Figure 29 represents the proportion of children that chose to share a given number of stickers with the Egoistic and Altruistic prosocial partners. These data were also within-subject and not normally distributed, so a nonparametric test was used. A series of Wilcoxon Signed-Rank tests were conducted to assess how the age groups differed in the number of tokens shared with the Altruistic and Egoistic prosocial partners. The Wilcoxon Signed-Rank test found no difference in the amount of tokens the 4- and 5-year-olds shared with the Altruistic prosocial partner ( $M = 1.0$ ,  $SD = .79$ ) or Egoistic prosocial partner ( $M = 1.1$ ,  $SD = 1.02$ ;  $z = .00$ ,  $p = 1$ ).

Similarly, there was no difference 6- and 7-year-olds' sharing with the Egoistic prosocial partner ( $M = 1.5, SD = 1.00$ ) or the Altruistic prosocial partner ( $M = 1.4, SD = 1.14; z = -.432, p = .666$ ). There was marginally significant difference for the oldest age group, such that 8- and 9-year-olds shared marginally more tokens with the Altruistic prosocial partner ( $M = 1.65, SD = .75$ ) than with the Egoistic prosocial partner ( $M = 1.35, SD = .67; z = -1.90, p = .058$ ).

### Figure 30

*The Proportion of Children in each age Group who Chose to Share a Given Number of Tokens with Each Prosocial Partner in the Trustor Role (total N=60)*



### Character Evaluations

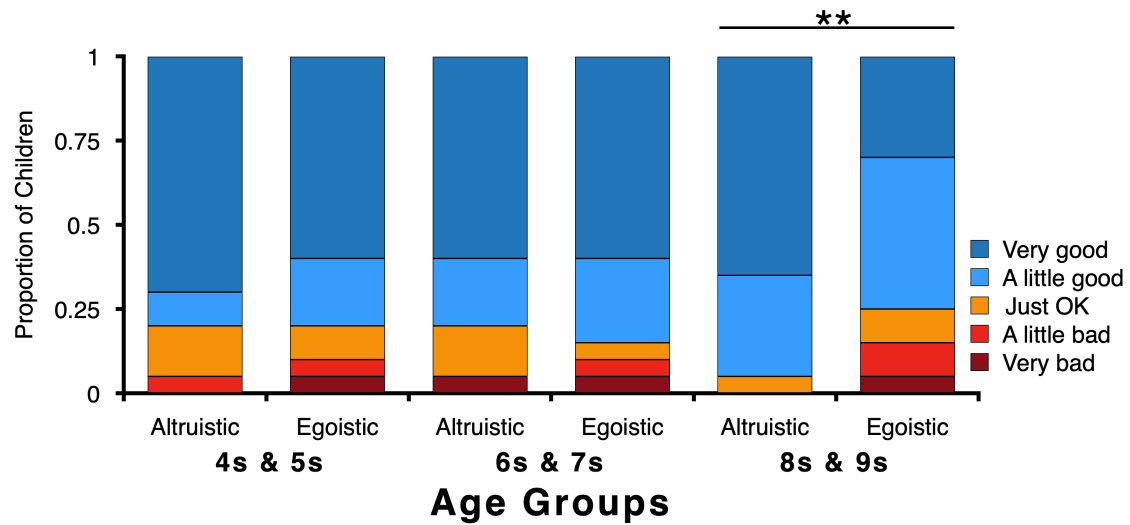
As with the children's emotional reactions, the data for the character evaluations were not normally distributed and required a nonparametric test. The distribution of children's character evaluation in each age group is represented in Figure 31. The Wilcoxon Signed-Rank test conducted to compare the 4- and 5-year-old's character evaluations of the Egoistic prosocial partner ( $M = 4.25, SD = 1.16$ ) and the Altruistic

prosocial partner ( $M = 4.4$   $SD = 1.1$ ) indicated that there was no significant difference in children's character evaluations of either prosocial partner ( $z = -.41, p = .684$ ). In contrast to the emotional response findings, a Wilcoxon Signed Rank test revealed that 6- and 7-year-olds evaluated the Egoistic prosocial partner ( $M = 4.3, SD = 1.13$ ) equally as good as the Altruistic prosocial partner ( $M = 4.35$   $SD = .93$ ) ( $z = -.06, p = .951$ ). In contrast, the Wilcoxon Signed-Rank test of 8- and 9-year-olds' character evaluations demonstrated a significant difference, such that this oldest age group evaluated the Egoistic prosocial partner ( $M = 3.85, SD = 1.14$ ) as less good than the Altruistic prosocial partner ( $M = 4.6, SD = .6$ ) ( $z = -2.19, p = .004$ ).

### Figure 31

*The Proportion of Children in Each Age Group who Chose a Given Character*

*Evaluation for Each Prosocial Partner (total  $N=60$ )*



### ***Character Evaluations Justifications***

Wilcoxon Signed-Rank test analyses revealed no statistical difference for any age group in the type of justification provided (all  $ps > .414$ ). In each age group, most children who provided a justification referenced the actions or outcomes of a given prosocial partner's behavior (range 35% to 60%; see Table 8). Kruskal-Wallis analyses revealed no significant differences across age groups in the type of justifications provided for the evaluation of the prosocial partners (all  $ps > .414$ ).

**Table 8**

#### *Children's Justifications for Character Evaluations*

Justification	4- and 5-year-olds		6- and 7-year-olds		8- and 9-year-olds	
	Altruistic	Egoistic	Altruistic	Egoistic	Altruistic	Egoistic
0	30% (6)	30% (6)	35% (7)	45% (9)	25% (5)	30% (6)
1	50% (10)	60% (12)	45% (9)	35% (7)	55% (11)	50% (10)
2	20% (4)	10% (2)	20% (4)	20% (4)	20% (4)	20% (4)

Note. The values represent the percentage of children (raw numbers in parentheses)

### **Forced-choice Questions**

A series of Kruskal-Wallis tests were conducted to assess differences between age groups in children's responses to the forced-choice questions. The proportion of children who answered the forced-choice questions in the hypothesized directions is represented in Figure 32. The Kruskal-Wallis analyses revealed significant age effects for three of the five forced-choice test questions. The three questions that did reveal a significant age group difference were the questions concerning whom the child would like to play a new game with ( $H(2) = 6.07, p = .048$ ), which prosocial partner would not help in the future ( $H(2) = 8.98, p = .011$ ), and which character cared more about themselves ( $H(2) =$

11.23,  $p = .004$ ). Follow-up Chi-square tests were conducted to explore, pairwise, how the age groups may differ in the responses to these forced-choice questions.

The Chi-square tests demonstrated that the 8- and 9-year-olds' (85%, 17 of 20 children) were more likely to prefer to play a new game with the Altruistic prosocial partner than 4- and 5-year-olds (50%, 10 of 20 children;  $\chi^2(1, N = 40) = 5.58, p = .018, V = .374$ ) and the 6- and 7-year-olds (55%, 11 of 20 children;  $\chi^2(1, N = 40) = 4.29, p = .038, V = .327$ ). There was no difference between 4- and 5-year-old and the 6- and 7-year-olds' responses ( $p = .752$ ). Likewise, the Chi-square tests demonstrated that the 8- and 9-year-olds' (100%, 20 of 20 children) were more likely to think the Egoistic prosocial partner cared more about himself/herself than 4- and 5-year-olds (55%, 11 of 20 children;  $\chi^2(1, N = 40) = 11.61, p < .001, V = .539$ ) and the 6- and 7-year-olds (65%, 13 of 20 children;  $\chi^2(1, N = 40) = 8.49, p = .004, V = .461$ ). There was no difference between 4- and 5-year-old and the 6- and 7-year-olds' responses ( $p = .519$ ). Finally, the Chi-square tests demonstrated that the 8- and 9-year-olds' (100%, 20 of 20 children) were more likely to think the Egoistic prosocial partner would not help them in the future 4- and 5-year-olds (65%, 13 of 20 children;  $\chi^2(1, N = 40) = 8.49, p = .004, V = .461$ ) and the 6- and 7-year-olds (65%, 13 of 20 children;  $\chi^2(1, N = 40) = 8.49, p = .004, V = .461$ ). There was no difference between 4- and 5-year-old and the 6- and 7-year-olds' responses ( $p = 1.00$ ). Overall, it appears that 8- and 9-year-olds were more likely to answer the forced-choice questions in the hypothesized ways than the other age groups.

A series of binomial probability analyses were conducted to see whether the children in each age group answered the forced-choice questions in the hypothesized ways.

**4- and 5-year-olds**

Binomial probability analyses indicated that the youngest age group, 4- and 5-year-olds, drew the hypothesized inferences for only one of the five questions. More 4- and 5-year-olds thought the Altruistic prosocial partner was nicer (75%, 15 of 20 children) than the Egoistic prosocial partner (binomial probability, using a test proportion of .50,  $p = .015$ ). The percentage of children who responded in the hypothesized way on each of the remaining questions ranged from 50% to 65%; binomial probabilities, all  $ps > .07$ .

**6- and 7-year-olds**

Binomial probability analyses indicated that 6- and 7-year-olds drew the hypothesized inferences for two of the six questions. Like the youngest age group, 6- and 7-year-olds thought the Altruistic prosocial partner was nicer (75%, 15 of 20 children) than the Egoistic prosocial partner (binomial probability,  $p = .015$ ). Additionally, this age group was more likely to say they would ask the Altruistic prosocial partner for help (81.25%, 26 of 32 children) rather than the Egoistic prosocial partner (binomial probability,  $p = .005$ ). The percentage of 6- and 7-year-olds who responded in the hypothesized way on each of the remaining questions ranged from 50% to 65%; binomial probabilities, all  $ps > .07$ .

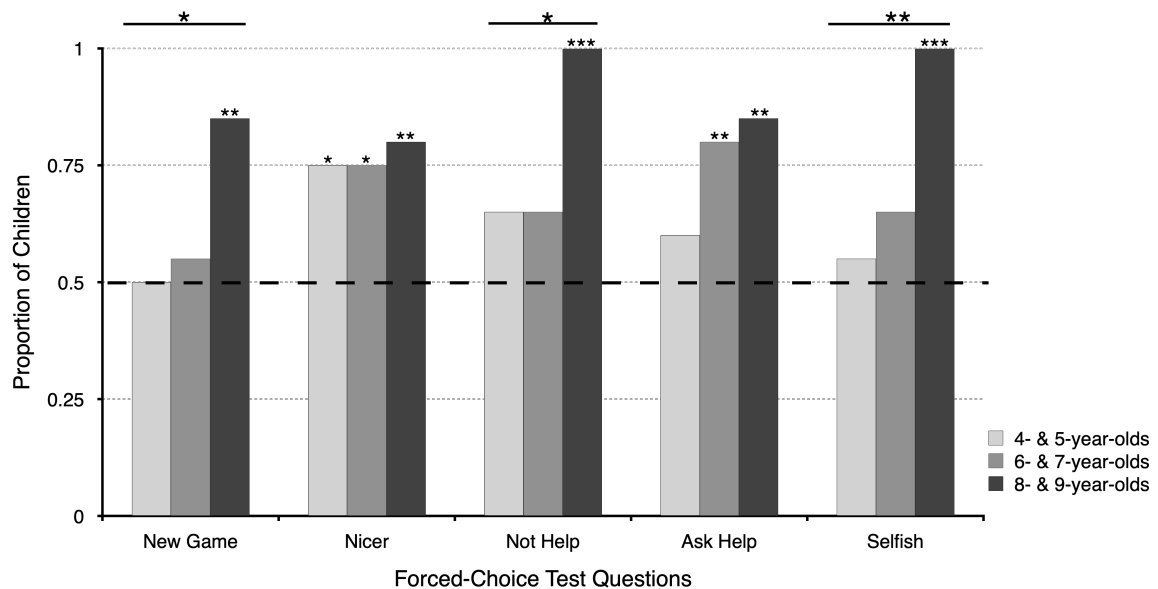
**8- and 9-year-olds**

Binomial probability analyses indicated that 8- and 9-year-olds drew all the hypothesized inferences. Like both younger age groups, 8- and 9-year-olds were more likely to think that the Altruistic prosocial partner was nicer (80%, 16 of 20 children) than the Egoistic prosocial partner (binomial probability,  $p = .005$ ). Like the 6- and 7-year-

olds, this age group said they would ask the Altruistic prosocial partner for help (85 %, 17 of 20 children) rather than the Egoistic prosocial partner (binomial probability,  $p = .001$ ). Additionally, the 8- and 9-year-olds were more likely to want to play a different game with the Altruistic prosocial partner (85%, 17 of 20 children; binomial probability,  $p = .001$ ), think the Egoistic prosocial partner would not help them in the future (100%, 20 of 20 children; binomial probability,  $p < .001$ ), and that the Egoistic prosocial partner cared more about themselves (100%, 20 of 20 children; binomial probability,  $p < .001$ ).

**Figure 32**

*The Proportion of Children in Each Age Group who Answered Each Test Question in the Hypothesized Way (total N=60)*



Note. The dashed line indicates chance level. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### ***Forced-choice Questions Justifications***

Children's justifications were compared across the age groups. Justifications were only included in analyses if children had answered the corresponding forced-choice question in the hypothesized direction (e.g., children who thought the Altruistic agent

was nicer than the Egoistic agent). Kruskal-Wallis analyses revealed a significant age group difference in the type of justification provided for one of the five forced-choice questions: the question about which prosocial partners cared more about themselves ( $H(2) = 6.26, p = .044$ ). Follow-up Mann-Whitney U tests were conducted to explore, pairwise, how the age groups may differ. The Mann-Whitney U tests demonstrated that the 8- and 9-year-olds' (70%, 14 of 20 children; *see Table 9*) justifications were more likely to reference the Egoistic prosocial partner's intentions than 6- and 7-year-olds (30.8%, 4 of 13 children;  $U = 70, p = .027$ ). No differences were found between 4- and 5-year-olds and 6- and 7-year-olds' justifications ( $U = 54.5, p = .331$ ) or 4- and 5-year-olds and 8- and 9-year-olds' justifications for their choice of the Egoistic prosocial partner ( $U = 88, p = .381$ ).

**Table 9**

*Children's Justifications for "Who cares more about himself/herself?" Forced-choice Question*

Justification	4- and 5-year-olds	6- and 7-year-olds	8- and 9-year-olds
0	45.5% (5)	69.2% (9)	20% (4)
1	0% (0)	0% (0)	10% (2)
2	54.5% (11)	30.8% (4)	70% (14)

Note. The values represent the percentage of children (raw numbers in parentheses). Only children who answered the question in the hypothesized direction are described in the table.

Kruskal-Wallis analyses revealed a marginally significant age group difference in the type of justification provided for the question "If you played a different game, whom would you rather play with [...]?" ( $H(2) = 5.96, p = .051$ ). Follow-up Mann-Whitney U tests were conducted to explore these differences pairwise.



The Mann-Whitney  $U$  tests demonstrated that the 8- and 9-year-olds' (58.8%, 10 of 16 children; *see Table 10*) justifications were more likely to reference the Altruistic prosocial partner's intentions than 4- and 5-year-olds (10%, 1 of 10 children;  $U = 42.5, p = .031$ ). No differences were found between 4- and 5-year-olds and 6- and 7-year-olds' justifications ( $U = 44, p = .468$ ) or 6- and 7-year-olds and 8- and 9-year-olds' justifications for their choice of the Altruistic prosocial partner ( $U = 69, p = .264$ ).

**Table 10**

*Children's Justifications for "If you played a different game, whom would you rather play with?" Forced-choice Question*

Justification	4- and 5-year-olds	6- and 7-year-olds	8- and 9-year-olds
0	80% (8)	63.6% (7)	35.3% (6)
1	10% (1)	0% (0)	5.9% (1)
2	10% (1)	36.4% (4)	58.8% (10)

Note. The values represent the percentage of children (raw numbers in parentheses). Only children who answered the corresponding forced-choice question in the hypothesized direction are included in the table.

All other Kruskal-Wallis analyses revealed no significant age group difference in the type of justification provided for the forced-choice questions ( $ps > .087$ )

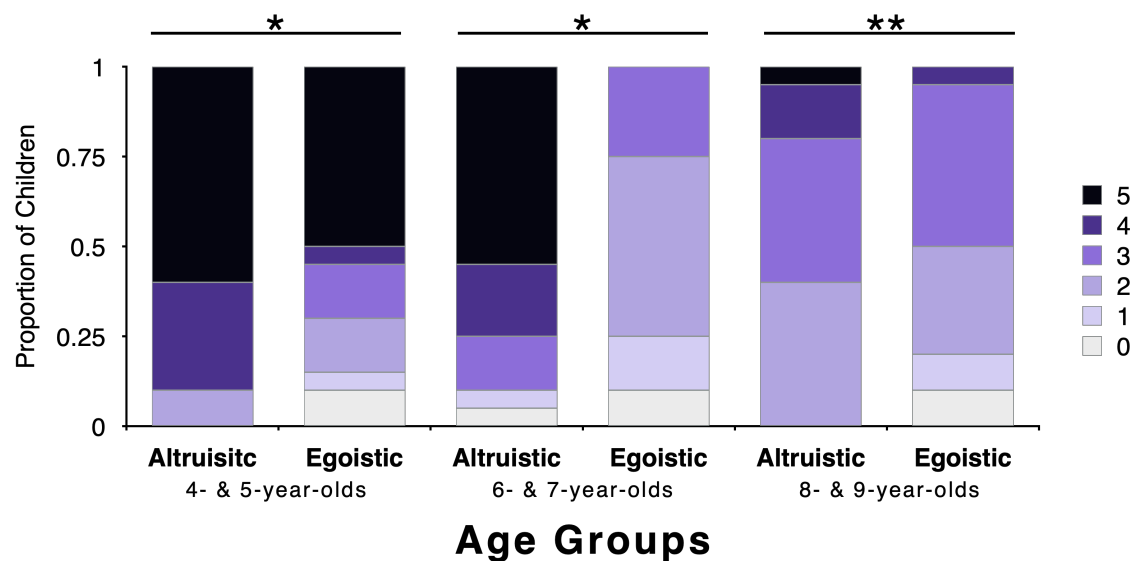
### **Prosocial Partner Box Prediction**

At the end of the game, children were asked to predict the number of tokens each prosocial partner had shared as the trustee in the second Trust Game. As with the previous data, these data were within-subject and not normally distributed; thus, a series of nonparametric Wilcoxon Signed-Rank tests were conducted to assess whether, in each age group, the predicted number of tokens differed between the Altruistic and Egoistic prosocial partners.

A series of Wilcoxon Signed-Rank tests were conducted to assess how the age groups differed in the number of tokens they predicted the Altruistic and Egoistic prosocial partners shared. These tests revealed a significant difference for all age groups such that at each age, children predicted that the Altruistic prosocial partner had given them more tokens than the Egoistic prosocial partner (see Figure 33). The Wilcoxon Signed-Rank test found that 4- and 5-year-olds' thought the Altruistic prosocial partner ( $M = 4.5, SD = .69$ ) shared more tokens with them than the Egoistic prosocial partner ( $M = 3.5, SD = 1.79; z = -2.0, p = .039$ ). Six- and seven-year-olds predicted that the Altruistic prosocial partner ( $M = 4.05, SD = 1.43$ ) placed more tokens in the box than the Egoistic prosocial partner ( $M = 3.15, SD = 1.79; z = -1.97, p = .048$ ). Similarly, 8- and 9-year-old thought the Altruistic prosocial partner ( $M = 3.8, SD = 1.47$ ) shared more tokens with them than the Egoistic prosocial partner ( $M = 2.75, SD = 1.37; z = -2.72, p = .007$ )

**Figure 33**

*The Proportion of Children in Each Age Group who Predicted a Given Number of Tokens were Placed in the Box by Each Prosocial Partner (total N=60)*



### **Developmental Changes in Trust and Trustworthy Behaviors**

To assess whether children displayed more trusting or trustworthy behaviors with age, children's trustor and trustee sharing behaviors with both prosocial partners were averaged together and compared across age groups. There were no significant differences between the number of tokens shared when the children were the trustors ( $H(2) = 2.77, p = .25$ ) or the trustees ( $H(2) = 2.86, p = .24$ ). Most 4- and 5-year-old children shared tokens and displayed both trusting behaviors ( $M = 1.21, SD = 1.6$ ) and trustworthy behaviors ( $M = 3.5, SD = 1.7$ ). Likewise, 6- and 7-year-olds displayed both trusting behaviors ( $M = 2.15, SD = 1.5$ ) and trustworthy behaviors ( $M = 2.95, SD = 1.55$ ). 8- and 9-year-olds also showed trusting behaviors ( $M = 2.22, SD = 1.03$ ) and trustworthy behaviors ( $M = 3.7, SD = 1.32$ ).

### **Discussion**

In this study, we examined whether 4- to 9-year-old children can distinguish between the motivations of an altruistic prosocial partner, who acts out of concern for their welfare, and an egoistic prosocial partner, who acts out of a desire for reciprocity. More specifically, the study used a series of iterative Trust Games to investigate when and how children incorporate these intentions into their evaluations, emotional responses, and predictions, as well as trustworthy and trusting behaviors. Supporting our hypotheses, this study found that children are more likely to incorporate intentions into their understanding of another's prosocial actions. Beginning at six years old, children incorporate intentions into their emotional reactions to someone's prosocial behavior but do not integrate intentions into their evaluations of the prosocial partners until 8-years-old. Regardless of age, children believed that the altruistic prosocial partner was nicer

and predicted they would share more tokens in the Trust Game. However, only 8- and 9-year-olds used prosocial intentions to predict future behavior and guide their own behavior. Thus, it seems that starting as early as four years old, but increasingly with age, children used the agents' intentions to guide their evaluations, predictions, and cooperative behaviors.

Regardless of age, children displayed trustworthy behaviors towards both prosocial partners and shared some resources when the allotment they received was contingent on the other players' sharing. Importantly, however, the older age groups' trustworthy behaviors were sensitive to the intentions of the prosocial partners, such that 6- and 7-year-olds as well as 8- and 9-year-olds shared more with the Altruistic prosocial partner when acting as the trustee in the Trust Games. Like adults, it seems that children's trustworthy behaviors may be a form of positive reciprocity, where an individual rewards their Trust Game partner based on both the gains from exchange and the intentions motivating the action (McCabe et al., 2003).

These results align with other research that demonstrates that children frequently share more resources with partners to reward their positive, cooperative behavior (Fehr et al., 2008; Oostenbroek & Vaish, 2019; Vaish et al., 2011). Moreover, sharing resources can be representative of a relationship or a desire to build a new one (Klapwijk & Van Lange, 2009; Liberman & Shaw, 2017; Olson & Spelke, 2008). Children's positive reciprocity may suggest that they may want to invest in the relationship with the Altruistic prosocial partner and reward the intentions behind their Altruistic prosocial partner's actions (McCabe et al., 2003). Thus, at least in the population we studied,

children incorporate intentions into their trustworthy behaviors and desire to reciprocate by six years of age.

Trust in this Trust Game requires that the child choose to take a risk and holds a prediction that the prosocial partner will reciprocate during their turn when the allotment increases. The study found that children across our age range displayed trust behaviors toward both prosocial partners, such that they shared some resources with both prosocial partners when given the initial allotment. The 8- and 9-year-olds demonstrated a marginal difference in how many resources they distributed to the Altruistic prosocial partner compared to the Egoistic prosocial partner when they were given the initial allotment and acted as the trustor in the second Trust Game. The current study extends the previous work that indicates that, as children age, their trust behaviors increasingly incorporate whether the other player is a trustworthy or untrustworthy partner (Rosati et al., 2019). The present results suggest that 8- and 9-year-old children somewhat differentiated altruistic from egoistic prosocial intentions when choosing to trust another player in a Trust Game. When 8- and 9-year-olds acted as the trustor in the first round of the Trust Game, they *marginally* shared more resources with the Altruistic prosocial partner than with the Egoistic prosocial partner.

While most younger children demonstrated trust and shared when they were the trustor, their behavior did not differ based on the prosocial partners' intentions in the previous game. In contrast, all children predicted that the Altruistic prosocial partner had shared more resources than the Egoistic prosocial partner, as indicated by how many tokens the children thought the prosocial partners placed in the box. As defined, trust is not only the prediction of others' reciprocity but also an individual's desire to take a risk

(Borum, 2010). Given that all children predicted that the Altruistic prosocial partner would share more resources, children's sharing as the trustor suggests that the 8- and 9-year-old children may have viewed the Egoistic as too risky of an investment.

Moreover, children's trust behaviors may also be conflated with developmental differences in risk-taking behaviors. Studies investigating children's risk-seeking and risk-taking behaviors indicate that children become more risk-averse as they age (Amir et al., 2021; Harbaugh et al., 2007; Paulsen et al., 2011, 2012; Rakow & Rahim, 2010). Thus, the trust behaviors in the study may be a measurement of children's cooperative risk-taking behaviors rather than only their predictions of prosocial partners' future behavior. Since forming new cooperative relationships where connections may be less established can be risky, risk-taking can be adaptive when building trust and developing relationships (Bjørnskov & Méon, 2015; Cook et al., 2016; Lupfer et al., 1971). Further research should be conducted to understand how risk-taking influences cooperative relationships and how children's inclination towards risk may be adaptive.

This study contributes to the growing literature related to children's trustworthy behaviors. It has been proposed that trustworthiness may be considered a social norm, where individuals will punish someone who fails to reciprocate another party's trust (Bicchieri et al., 2011) (Bicchieri et al., 2011). Even children as young as five to six consider reciprocity a norm and actively enforce it (Wörle & Paulus, 2019). Most children in these age groups reciprocated the trust of the Egoistic and Altruistic prosocial partner, such that most children shared some stickers regardless of intentions. 6- and 7-year-olds and 8- and 9-year-olds demonstrated increased trustworthy behaviors by reciprocating more with the Altruistic prosocial partner when the children's allotment

was based on the agent's prosocial behavior. These results help support intention-based theories of trustworthy behavior, which propose that the children reward the prosocial partner based on both the gains from the exchange and the children's beliefs about the intentions motivating the action of the first mover (McCabe et al., 2003). In this way, children engage in positive reciprocity and reward the Altruistic prosocial partner for having the right motives for their actions (Falk & Fischbacher, 2006; Lacour, 2012; McCabe et al., 2003). These results support the results in Chapter 3 of this dissertation, where older children thought the recipient should provide the Altruistic prosocial partner with a resource even though the Egoistic prosocial partner was motivated by a desire for reciprocity. Moreover, the results of this study extend previous research that demonstrates that young children understand intentions and share more with those who are intentionally rather than accidentally prosocial (Vaish et al., 2018; Woo et al., 2017). This study suggests that children engage in trustworthy behaviors motivated by more than just a desire to reciprocate. Instead, this behavior may serve as a reward for the partner's positive intentions.

Our results complement previous work demonstrating that children use complex information-laden prosocial intentions and that children can distinguish between more than just accidental and intentional prosocial behavior. Surprisingly, this study did not find the "outcome-to-intention" shift in children's moral judgments that prior work has demonstrated and that we saw in Chapter 3, wherein children six years of age and older increasingly utilize intentions when evaluating others' behavior (Cushman et al., 2013; Margoni & Surian, 2017). Instead, only 8- and 9-year-old children's evaluations of goodness or badness were sensitive to the nuanced intentions of an individual's prosocial

behavior, such that only this age group evaluated the Altruistic prosocial partner more positively than the Egoistic prosocial partner and wanted to affiliate with them in the future. While only 8- and 9-year-olds' goodness and badness evaluations were sensitive to intentions, all age groups thought that the Altruistic prosocial partner was "nicer" than the Egoistic prosocial partner when answering the forced-choice questions. So, it seems that potentially even from a young age, children's evaluations may be sensitive to these intentions. Children used a scale to provide their goodness evaluations, while children's evaluations of niceness were based on a forced-choice response, possibly a simpler method for young children. It is also possible that children may distinguish between "niceness" and "goodness" and their meaning. Many studies of children's moral judgments use these words interchangeably, but these words are subject to cultural influence and can be interpreted in a non-moral way. Further work should be conducted to understand what children think these words mean and how this can influence their application to moral concepts.

Fiske's relation model may provide another possible explanation for this discrepancy in this measure, as well as the differences between Chapter 3 and the current study. Given that the other players in the Trust Game were strangers, children in the present study may have applied an Equality matching relation model, where those in the relationship work to ensure balance through one-for-one correspondence, such as reciprocity, turn-taking, and tit-for-tat retaliation. Moreover, adults use social roles and relationships to form and update what is considered morally acceptable (Crockett & Everett, 2021). Similarly, children may have viewed the Egoistic prosocial partner's intentions and behavior as morally acceptable since they have weak ties with no previous



relationship. Therefore, an Equality matching relation model may apply where a desire for reciprocity is a good motivation (Earp et al., 2021a; Simpson et al., 2016; Zickfeld et al., 2017). Further research should explore how children use their relationships to guide the behavior they think is acceptable or praiseworthy and what they expect from their relationship partners.

The present study was also the first to show that both 6- and 7-year-old and 8- and 9-year-old children may experience different emotions in response to whether an individual acted out of altruistic from egoistic intentions. These age groups were more likely to indicate that they would feel “both happy and unhappy” when an individual shares with them based on a desire for reciprocity. These results extend the work in Chapter 3 and the adult work that suggests that recipients of prosocial behavior motivated by concern were more likely to feel positive emotions. In contrast, the recipients of prosocial behavior motivated by a desire for reciprocity were more likely to experience negative emotions (Peng et al., 2017; J. A. Tsang, 2006). Unlike the previous chapter, however, children’s justifications for their emotional experience were based on the outcome of the prosocial partner’s behavior. They did not differ across age groups or between prosocial partners. Further work needs to be conducted to clarify the mechanism underlying the difference in children’s emotional reactions when an individual is prosocial out of altruistic versus egoistic intentions.

As in the previous chapter, children did not endorse a negatively valenced emotional state like “just unhappy”; instead, 6- and 7-year-old and 8- and 9-year-old children indicated that they felt more mixed emotional states. This challenges previous adult research that argues that when individuals act out of a desire for reciprocity, the

recipient experiences primarily negative emotional states like indebtedness (Peng et al., 2017; Tsang 2006, 2007). Interestingly, 6- and 7-year-olds reported experiencing mixed emotions at an earlier age than seen in the emotional predictions of the children in Chapter 3. The results of Chapter 3 paralleled the previous work on mixed emotions in children, which suggests that only around eight years old do children understand and employ mixed emotional states (Larsen et al., 2007; Pons et al., 2004). The mixed state of “happy and unhappy” is a more straightforward concept as the only distinction is the valence of the emotional states, rather than emotions that may be more conceptually rich like anger, sadness, etc. It is possible that children could endorse mixed emotional states due to these labels.

On the other hand, it is also possible that these methods may have tapped into children’s emotional experiences more effectively than other measures, which rely on children’s reactions to emotion eliciting videos or describing others’ emotional states. It is important to note that the experimenter directly asked the child whether they were experiencing positive, negative, or mixed emotional states, rather than the children spontaneously generating these states themselves. It is also possible that trichotomous variables of “just happy,” “just unhappy,” or “both happy and unhappy,” as well as the ability to reflect on their response, may have provided some assistance. Future studies would benefit from a more nuanced emotion measure. For example, researchers may ask the child to indicate the amount of a given emotion on a five-point scale (see Beeler-Duden & Vaish, 2020). Suppose the experimenter asked the child to provide the level of emotion for both the emotional valences (happy and unhappy). In that case, even young children might be better able to provide mixed emotional state responses. Moreover, this

would allow children to indicate their level of happiness rather than assessing only the valence of the response, which may better detect differences in children's emotional reactions based on the prosocial partner's intentions.

A critical limitation of this study is that we measured children's understanding and use of intentions in one specific context, a Trust Game. While the Trust Game investigates both trust and trustworthy behaviors, and trust is an essential component of cooperative relationships, the Trust Game has inherent expectations for the players' behavior, specifically that an individual will reciprocate (McCabe et al., 2013). Moreover, using an iterative Trust Game may have encouraged different strategies and concerns than a single-shot Trust Game or another economic game, such as the Dictator Game. For example, repeated Trust Games in adults can lead to reputation-based concerns and increased focus on the relationship's future (Engle-Warnick & Slonim, 2004). A possible explanation for the lack of difference in children's trusting behaviors is that reciprocity is inherent in the Trust Game, which motivated token sharing with the prosocial partners regardless of intentions. In this study, as well as others, most children are willing to invest in new relationships, as evidenced by children's propensity to display trusting behaviors (Rosati et al., 2019). Future studies should be conducted to see how children apply and use altruistic and egoistic intentions in other contexts to understand better what information these intentions hold for children. For example, children's generosity, as measured by the Dictator Game, may be more sensitive to altruistic and egoistic intentions, as this game has less expectation of reciprocity. Moreover, children's behavior in a Trust Game is thought to be distinct from the generosity seen in a Dictator Game, such that children share more resources as both the trustor and trustee than in a

Dictator game (Amir et al., 2022; Rosati et al., 2019). This proposed study would provide a better understanding of how altruistic and egoistic intentions may influence children's cooperative behaviors.

A further significant limitation of our study concerns the study sample. The current study examined primarily tested children whose parents are highly educated, affluent, and from a large-scale industrialized society. There is substantial cross-cultural variation in the importance placed on intentions, and the role intentions play in moral judgments may not be universal (Barrett et al., 2016b; Barrett & Saxe, 2021; Henrich et al., 2010; Saxe, 2016). Notably, the prior work indicating this cultural variation has primarily been conducted with adults. Given this variation and our results in both this study and the study in Chapter 3, it would be interesting to test the generalizability of the present results to other societies. Moreover, studies should explore how and when children learn about the culture-based value of intentions.

The final limitation is that the current study discusses altruistic and egoistic motives as mutually exclusive within cooperative relationships. It is possible to be motivated by concern for another's welfare while also wanting that individual to return your kindness. Care-based cooperative relationships can be one-sided, such as the relationship between a parent and an infant. Still, within care-based relationships like friendships or romantic partnerships, each member is (expected to be) invested in the well-being of the other. Asymmetries in these relationships can impact the partner's perceived commitment to the relationship, an individual's trust in the partner, and the relationship's longevity (Agnew et al., 1998; Stanley et al., 2016; Wieselquist et al., 1999). The purpose of the current study was a first step in exploring how children

comprehend and employ these intentions in their social relationships. Future research should investigate how children reconcile care-based relationships with a desire for mutual investment and reciprocity in the relationship.

Overall, the present study suggests that children from early in development in the population sampled can understand and utilize the intentions that motivate an individual's prosocial behavior. Furthermore, children incorporate nuanced prosocial intentions like a desire for reciprocity or concern for another's welfare, not just whether an action was accidental or intentional. The use of these intentions becomes more sophisticated with age. As young as four years old, children already may perceive an individual who acts out of concern as nicer and as more likely to be prosocial. Children's trust and trustworthy behaviors seem to be also impacted by these information-laden intentions. Thus, children comprehend and utilize an individual's intentions from an early age, which are crucial for helping humans understand and navigate their social world. This essential skill allows individuals to choose reliable and trustworthy future partners and identify which relationships to invest their resources into, facilitating positive, cooperative relationships. Working together and interacting with other skills, the ability to distinguish and make use of intentions likely helped foster novel cooperative relationships. It contributed vitally to cooperation and the evolutionary success of humanity.

### **Conclusion**

Cooperative relationships allowed early humans to accomplish tasks that were vital for their survival and formed the foundation our social and societal structures (Tomasello et al., 2012). Now, modern humans benefit from similar cooperative partnerships by helping with child-rearing, attending to threats, and working together to

obtain food (Ainsworth, 1989; Caporael & Brewer, 1995; Waal & Aureli, 1996). Importantly, large-scale cooperative societies necessitate that humans establish new cooperative partnerships with unknown others, such as strangers, with whom one has no established relationships (Boyd & Richerson, 1989; van den Berghe & Alexander, 1988). Thus, the ability to identify good cooperative partners becomes vitally important for humans' survival and flourishing. Intentions help individuals navigate this difficult challenge, as they allow individuals to generate more accurate prediction about their potential partners and future cooperation (Cushman, 2008; Falk & Fischbacher, 2006; Lopes, 1994). This dissertation aimed to examine how we identify trustworthy and dependable cooperative partners. Specifically, this dissertation sought to explore when humans develop the ability to understand and make use of others' prosocial intentions and how altruistic and egoistic prosocial intentions shape children's predictions of others' behavior, evaluations of the prosocial individuals, and guide their own cooperative behavior.

In the first study (Chapter 2), we aimed to investigate children's lay theories of others' prosocial intentions. The results indicate that 4- to 9-year-old children in the sample we tested primarily believe that people act out of other-oriented altruistic motives rather than egoistic and self-serving motives. Similar to work that argues that children's *own* prosocial behavior is primarily motivated by care-based motivations (e.g., empathy, sympathy, etc.), children also believe that one of the primary motivators of others' prosocial behavior is their concern for an individual's welfare or desire to fulfill that individual's need (Eisenberg et al., 2006; Hao & Du, 2021; Hepach et al., 2012, 2017; Padilla-Walker & Carlo, 2014). Children in the study also described the prosocial

behavior as motivated by the prosocial agent's positive disposition and good character. Further, regardless of age, children evaluated an individual as less good when their prosocial behavior resulted from a parental request. This study also found that parental values and socialization were associated with children's prosocial intention assumptions: Parents who valued caring for others and community loyalty were more likely to have children who thought the prosocial behavior was motivated by care-based motivations.

This study is one of the first to show how children interpret someone's ambiguous prosocial motives and provide context for how these preconceptions can shape children's perceptions and responses to their social world. For example, these findings may provide insight into the "negativity bias," where adults and children are biased toward negative cues (for a review, see Vaish et al., 2008). Since young children seem to assume others act out of good intentions, negative social information and behavior may be given greater weight because this is not consistent with their predictions that others act out of concern for others and positive dispositions. Children's predisposition to assume positive sociomoral character traits as motivators for prosocial behavior imply that children may already believe and prefer that prosocial behavior is intrinsically motivated and may also assume that a prosocial individual will continue to be prosocial. Thus, this study provides context and a greater understanding of how children's assumptions may shape children's perceptions and responses to their social world.

The second study (Chapter 3) expanded upon this work and examined experimentally how 4- to 8-year-old children react to others' prosocial intentions and use them to navigate their social world. Intentions provide vital information about potential cooperative partners, such as whether they are likely to be prosocial in the future and if

they are invested in the cooperative relationship. This study aimed to explore when children develop the ability to understand and incorporate prosocial intentions into their predictions, evaluations, and responses to prosocial individuals. Given that children assume prosocial individuals are acting with care-based intentions and concern for others' welfare, the study investigated when children distinguish between prosocial behavior motivated by egoistic self-serving compared to altruistic care-based intentions and how these intentions inform children's moral judgments and predictions of future behavior.

The study found that children as young as 6 years old incorporate intentions into their evaluations of someone's prosocial behavior (i.e., goodness or badness) and whom they would solicit help from. These results extend other research on children's moral judgments of accidental and intentional behaviors, which finds an "outcome-to-intention" shift in these judgments, such that young children's moral judgments are primarily based on the outcomes of the action, but children's moral judgments begin to rely on the intentions behind the actions consistently at six years old (Cushman et al., 2013; Margoni & Surian, 2017). Consistent with these studies, children's justifications in our study indicated that whereas the 4- and 5-year-olds' referenced the outcomes of the action when making their decisions, the older groups relied on the intentions behind those actions more often. This study is the first to find that children distinguish more than just whether an action was accidental or intentional but rather nuanced and information-laden prosocial intentions can inform children's moral judgments to and guide their behavior from an early age.



Eight and nine-year-olds were the only age group in this study to think that the recipient of prosocial behavior should reward the Altruistic prosocial agent and that the Altruistic prosocial agent will be more prosocial in the future. Additionally, when predicting how the recipient of the prosocial action would feel, 8- and 9-year-olds were the only age group that thought the recipient would feel mixed emotions (i.e., “both happy and unhappy”) after the Egoistic prosocial agent acted prosocially. These results may suggest a potential mechanism and support Cushman and colleagues' developmental constraint model of intent-based moral judgment (Cushman et al., 2013), which argues that intent-based judgments develop first, then this new understanding causes a reorganization of concepts within the moral domain, thereby impacting children's moral behaviors. Under this account, our findings suggest that 6- and 7-year-olds in the study incorporated intentions into their evaluations. Only after this reorganization of moral concepts could 8- and 9-year-olds utilize these intentions to inform their predictions of the prosocial agents and whether they deserve to be rewarded.

Interestingly, regardless of age, children used intentions to make predictions about the relationship between the prosocial agents and the recipient, such that children at all ages thought the recipient would have a closer relationship and desire to affiliate more with someone whose prosocial behavior was motivated by concern for another's welfare. Taken together, the results described in Chapter 3 find that children can distinguish between and incorporate altruistic and egoistic prosocial intentions into their understanding of the social world. Importantly, children's evaluations, predictions, and behavior are differentially impacted by these intentions across development, and the role intentions play becomes more sophisticated with age.

The aim of the third study (Chapter 4) was to examine how children use altruistic and egoistic intentions to inform their *own* cooperative behaviors and predictions of their prosocial partners' behavior. Using a repeated Trust Game, the study measured how the prosocial partners' intentions impacted children's desire to reciprocate and invest in the relationship (trustworthy behavior) as well as their willingness to take a risk, based on their prediction of the partner's future cooperative behavior (trusting behaviors) (Amir et al., 2022; McCabe et al., 2013). In the first Trust Game, 6- and 7-year-olds as well as 8- and 9-year-olds showed more trustworthy behavior towards the Altruistic prosocial partner by sharing more resources when their allotment was contingent on the prosocial partners' behavior. As with children's moral judgments, children showed an outcome-to-intention shift in their trustworthy behavior, where only after age six do children incorporate intentions into their trustworthy behavior (Cushman et al., 2013; Margoni & Surian, 2017). Moreover, children frequently share more resources with partners to reward their cooperative behavior or represent their affiliation (Fehr et al., 2008; Liberman & Shaw, 2017; Olson & Spelke, 2008; Vaish & Oostenbroek, 2018, Vaish et al., 2011). Thus, older children's *positive reciprocity* suggests that they may want to invest in the relationship with the Altruistic prosocial partner and reward the intentions behind their Altruistic prosocial partner's actions (McCabe et al., 2003).

As discussed in Chapter 4, trusting behaviors include a desire to take a cooperative risk, which is based on the prediction of a partner's cooperative behavior (Amir et al., 2022; McCabe et al., 2013). The study in Chapter 4 finds that all children were willing to take risks and display trusting behaviors toward both prosocial partners, and 8- and 9-year-olds were the only age group to incorporate intentions into their

trusting behaviors somewhat. Yet only 8- and 9-year-olds anticipated the Egoistic prosocial partner would be less likely to be prosocial should the child need help in the future. Remarkably, all age groups predicted that the Altruistic prosocial partner would show more trustworthy behavior, such that children expected that the Altruistic prosocial partner had shared more tokens than the Egoistic prosocial partner in the second Trust Game. These results suggest that even young children use intentions to predict who will be generous in the future. Still, only around eight to nine years of age did intentions inform their cooperative risk-taking and generalization of others' prosocial actions.

Unlike the moral evaluations in Chapter 3, children's evaluations of goodness in Chapter 4 did not show the outcome-to-intention shift around age 6, as 8- and 9-year-olds were the only age group to evaluate the Egoistic prosocial partner as less good than the Altruistic prosocial partner. Interestingly all children, regardless of age, thought that the Altruistic prosocial partner was "nicer" than the Egoistic prosocial partner in the forced-choice questions. This suggests that even young children are utilizing intentions to evaluate their prosocial partners. Studies investigating children's moral judgments frequently ask children to judge how "good," "bad," "wrong," "nice," etc. an individual may be. Nonetheless, all these words are subject to cultural influence and can also be interpreted in a non-moral way. Children evaluated "niceness" with a forced-choice question, which might be easier to comprehend than the evaluation scale. It is also possible that children may make a distinction between the two words and these words may carry different meanings. For adults, a "nice" person, meaning agreeable, polite, or kind person, is related to but distinct from a "good" person, which is thought to mean virtuous, right, or commendable person (Merriam Webster, 1828). Future studies need to

explore how children comprehend and apply these particular words to the situation in question, as it may greatly influence the interpretation of the study results.

Also, contrary to the results in Chapter 3, 6- and 7-year-old as well as 8- and 9-year-old children in Chapter 4 indicated that they felt more mixed emotional states upon receiving tokens from a prosocial partner who is motivated by a desire for reciprocity. Interestingly, children reported experiencing mixed emotions at an earlier age (6 and 7 years) than seen in children's emotional predictions for the recipient in Chapter 3. What is more, these results appear to occur developmentally earlier than other research investigating children's emotional states, which suggests that only around eight years old do children recognize and use mixed emotional states (Pons and Harris; Larsen, To, & Fireman, 2007). These results begin to address how intentions may influence children's emotional responses in cooperative interactions. In adults, intentions greatly affect whether individuals feel the potentially negative emotion of indebtedness or the positive emotion of gratitude (Peng et al., 2018; Tsang, 2006, 2007). Gratitude is the positive emotion one experiences when another person has given one something of value and is theorized to be a compound emotion that arose from the admiration of a praiseworthy action and the joy experienced in response to some benefit (Ortony et al., 1988 (Wood, Maltby, Stewart, Linley, & Joseph, 2008). In contrast, one is thought to experience a sense of indebtedness when one receives a benefit from someone, but that individual is motivated by the desire for reciprocity (de Cooke, 1992; Peng, Nelissen, & Zeelenberg, 2018). In children, previous research found that gratitude may underly some cooperative behaviors in children as early as three years old (Beeler-Duden & Vaish, 2020; Vaish et

al., 2018). Less is known about children's sense of indebtedness and its role in cooperation.

Given that 6- and 7-year-old as well as 8- and 9-year-old children in the study endorsed mixed emotions, it is possible that children at these ages may have experienced a sense of indebtedness when the prosocial partner was motivated by a desire for reciprocity. Further work is necessary to understand the role altruistic and egoistic intentions play in children's emotions and the relation to their cooperative behavior. For example, future research could investigate how altruistic and egoistic intentions impact children's emotions and generosity behaviors. Reciprocity is inherent to the Trust Game. Most children are willing to invest in new relationships, as evidenced by the propensity of children displaying trusting behaviors in this study and others. The suggested follow-up may help distinguish children's feelings of indebtedness from gratitude and allow us to understand the role of intentions in the development of this phenomenon.

The results in Chapter 3 find that children's evaluations of third-party scenarios were sensitive to the intentions of the prosocial individuals starting at six years old. Still, in Chapter 4, only 8- and 9-year-olds' evaluations incorporated the intentions of the prosocial individuals. One potential explanation is that intentions differentially influence children's evaluations when witnessing others' prosocial behaviors compared to when they are the recipient of prosocial behavior. Another alternative is that children are applying different relational models to what is expected and acceptable in those relationships. Children as young as three readily use behavioral cues such as proximity and time spent between individuals, loyalty, and partiality in resource sharing to infer the relationship between individuals (Lieberman & Shaw, 2017, 2019). In Chapter 3, children

may have inferred a stronger connection between the two characters than they felt with the children they “didn’t know” in the Trust Games.

In adults, the relationship between two individuals, whether it be strangers, friends, or authority figures, greatly influences what is anticipated and acceptable in social interactions (Earp et al., 2021; Fiske, 1992; Shakti & Fiske, 2011; Simpson et al., 2016). For example, inequality is considered less of a violation in a close relationship than withholding empathy or care (Rai & Fiske, 2011; Simpson et al., 2016). Moreover, relationships with strangers and acquaintances are hypothesized to be motivated by equality and reciprocity, while relationships like friendships or romantic relationships are thought to be motivated by unity and care (Fiske, 1992; Shakti & Fiske, 2011; Simpson et al., 2016). Given that the relationship was not explicitly stated in the study in Chapter 3, it is difficult to know what type of relationship children inferred. Importantly, work in moral development frequently investigates judgments and behaviors concerning strangers. Further work is necessary to assess whether and how children change their moral judgments and subsequent expectations based on the relationship between individuals. For example, explicit labeling of the relationships (friends or strangers) between the prosocial agents and recipient could be added to the study in Chapter 3 to see how these relationships might inform children’s evaluations of the individuals’ motivations and their predictions of their behavior. This would begin to uncover the flexibility of children’s moral judgments and provide a new depth to our understanding of moral development.

One substantial limitation of the studies conducted in this dissertation concerns the study sample. While conducting the studies online increased the diversity of our

sample, the samples for all three studies were predominately from WEIRD (Western, educated, industrialized, rich, and democratic) populations. Most parents in our study samples were from the United States, highly educated, and affluent. The study in Chapter 2 explored how parents' values relate to children's assumptions of others' prosocial intentions. Previous studies suggest that culture and parental values can influence the prosocial behavior children engage in, as well as their judgments and evaluations of others' prosocial behavior (Fonseca et al., 2018; Lavelli et al., 2013, Dôgo Resende et al., 2016; Kärtner, 2018). Importantly, while intentions do play a role in most cultures' moral judgments, the culture shapes how much influence intentions have on individuals' judgments and behaviors. Recent cross-cultural research finds notable variation in the importance placed on intentions, and the role intentions play in moral judgments (Clark Barrett et al., 2016, Henrich et al., 2010). For example, smaller-scale, non-western societies such as Hadza, Himba, and Yasawa place less value on intentions, and intentions exert less influence on their moral judgments (Clark Barrett et al., 2016). These studies are an essential first step in exploring children's assumptions about prosocial intentions and how children utilize others' prosocial intentions. However, further research should be conducted in various cultural contexts to better understand the development of children's prosocial intention understanding.

A further limitation is that children's responses may vary based on their early life experiences, even in the regions sampled for the current studies. An individual's predictions about others and their environment are based on past experiences (Seligman et al., 2016). What is more, early life experiences can bias children's social information processing (Dodge, 1980; Nasby et al., 1980). For example, early exposure to hostile

socialization experiences, such as peer rejection and or harsh parenting behavior, lead children to interpret others' ambiguous or benign behaviors as having hostile intent (Dodge, 1980; Orobio De Castro et al., 2002). Children with these past experiences or biases in social information processing may also not assume positive, altruistic intentions behind prosocial behavior. Given that samples in the current studies were from highly educated and affluent backgrounds, they may not represent a "universal" positive bias. Rather children may be interpreting these prosocial situations as a result of their specific developmental experiences and other children with different backgrounds may not interpret these situations in the same way. Further research should explore how early life experiences may guide and shape children's predictions of others' prosocial intentions.

The present dissertation explored how we identify trustworthy and dependable cooperative partners and how intentions may facilitate this critical task. Across three studies, I found that children (at least in our samples) assume that others' prosocial behavior is motivated by concern- and care-based intentions. Moreover, children from quite early in development can distinguish between prosocial individuals who act with egoistic self-serving versus altruistic other-oriented motives. As children age, their use of these intentions becomes more sophisticated. It begins to inform what is considered morally good, predictions of others' behavior, and whom they desire to affiliate with. This crucial skill allows individuals to choose reliable and trustworthy future partners, actively expanding their cooperative networks and allowing individuals to establish new positive, cooperative relationships. Thus, humans could extend cooperation beyond kin and previously established cooperative partners and thereby contributing to the emergence and success of our large-scale cooperative societies.



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## Appendix

### Appendix A

#### *Prosocial Socialization Questionnaire*

When someone does something nice for your child, such as helping your child with a task, how often do you...?	Abbreviation
I tell my child to show appreciation.	Appreciation
I tell my child they should return the favor.	Reciprocity
I ask my child whether they earned the favor.	Earned
I talk to my child about their emotions after they receive the favor.	Emotion
I talk to my child about how nice/kind the person is.	Characteristics
I highlight the effort made by the person who did the favor.	Effort
I highlight who is responsible for the favor.	Responsibility
I highlight the person's intention in doing the favor.	Intention

## Appendix B

### *Modified Kärtner Socialization Goals Questionnaire*

How important do you think children should learn the each of the followings?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Children should learn to take care of others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to do what the teachers say.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to know the difference between good and bad.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to feel affiliated to a larger group.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to help other children.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to share things with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Children should learn to comfort children when they cry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to be fair.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to take responsibility for certain things in the group.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn not to hurt other children (physically).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to be fair when playing with other children.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children should learn to respect other children.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix C

### *Children Prosocial Stories*

The study contains eight stories that counterbalance each prosocial agent's behavior and match the characters with the child's gender.

#### *Green - Book - Male*

This is Green. And this is Louis. One day after school, Green saw Louis carrying lots of heavy books. While Louis was carrying the books, he dropped all his books on the ground. Green saw that Louis dropped all his books. Green stopped and helped Louis pick up his books.

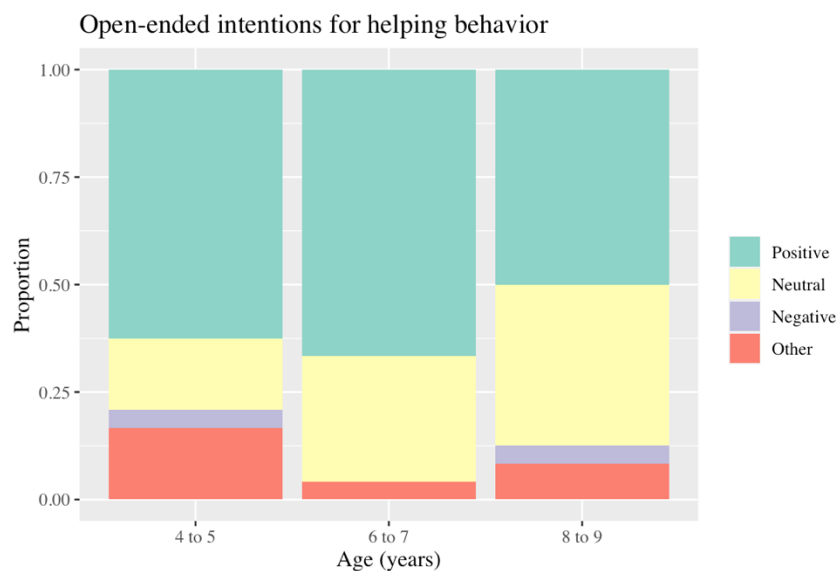
#### *Yellow - Sticker - Female*

This is Yellow. And this is Louisa. One day, Yellow had two stickers, and Louisa did not have any stickers. Yellow gave Louisa one of her stickers.

## Appendix D

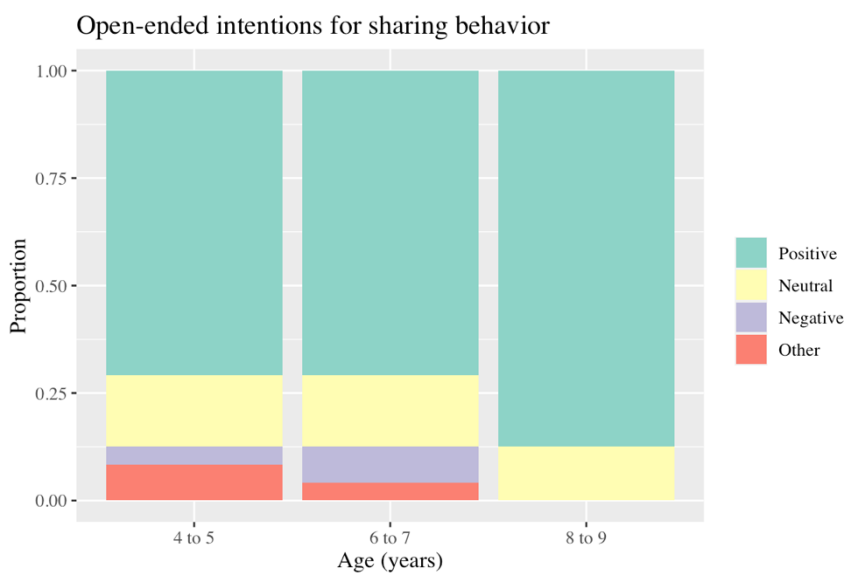
### *The Proportion of Children's Responses During the Open-ended Prosocial Motivation*

#### *Question in Valence Categories Following the Helping Prosocial Story*



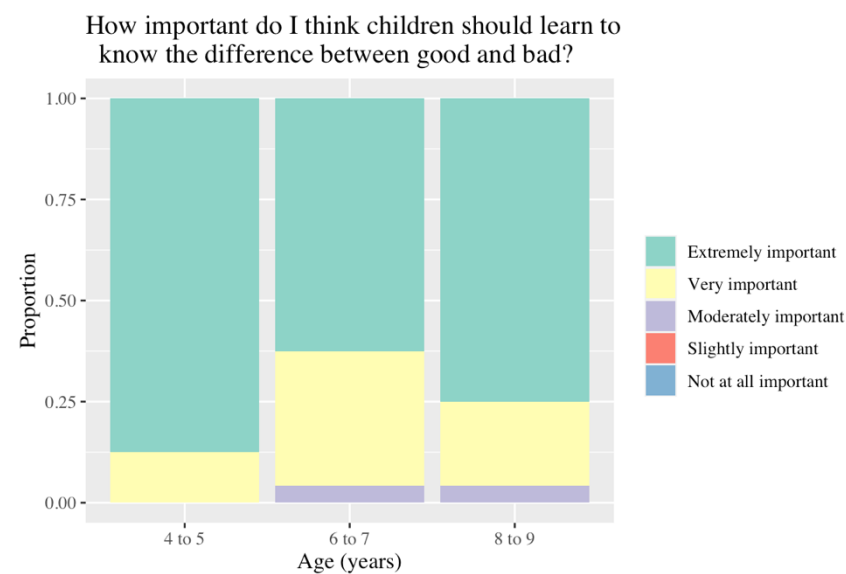
## Appendix E

*The Proportion of Children's Responses During the Open-ended Prosocial Motivation Question in Valence Categories Following the Sharing Prosocial Story.*



## Appendix F

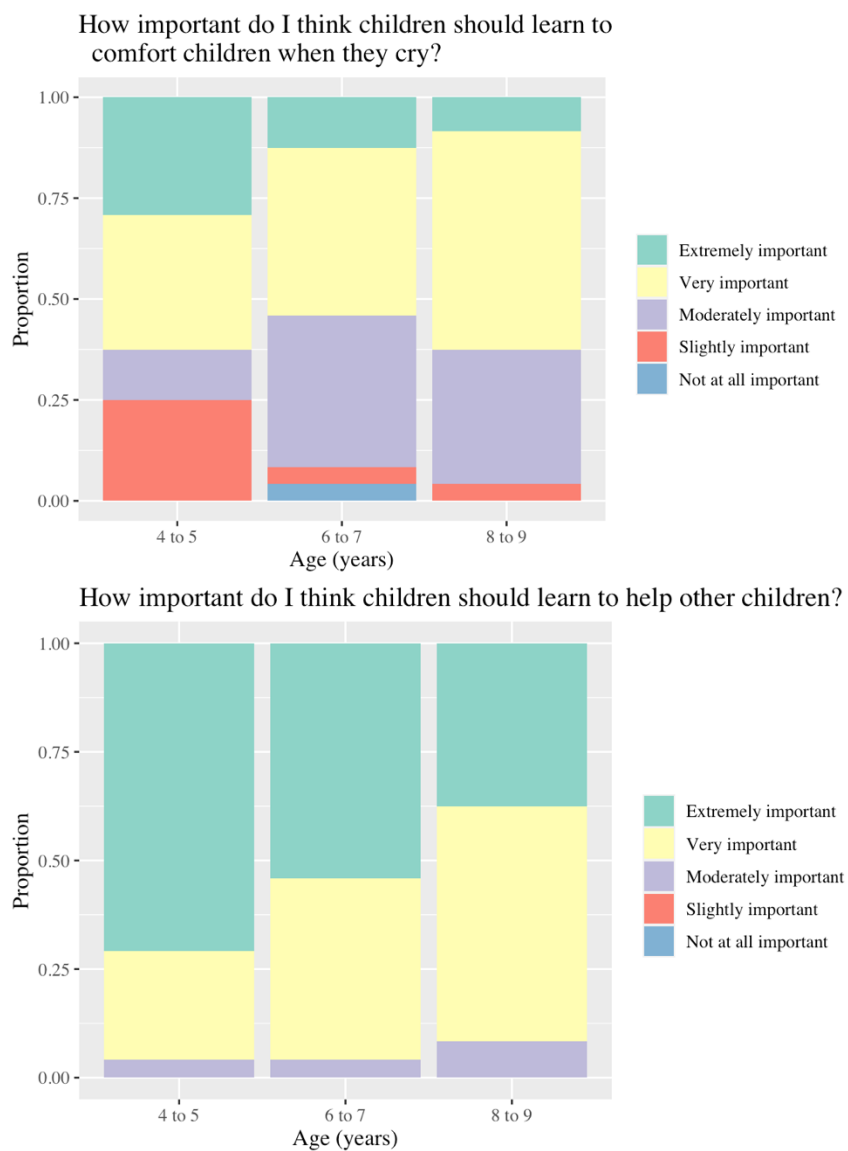
*The Proportion of Parent's Responses in the Kärtner Socialization Goals Moral Evaluation Subscale*



## Appendix G

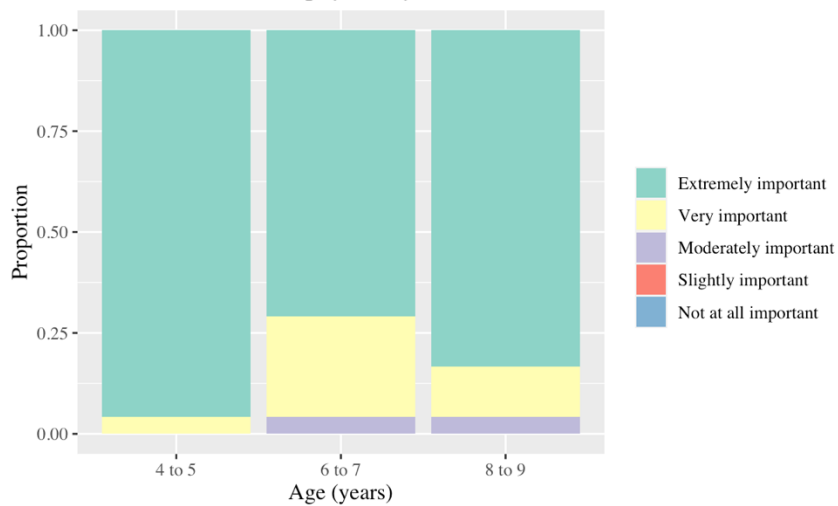
### *The Proportion of Parent's Responses in the Kärtner Socialization Goals Autonomy Care*

#### *Subscale*

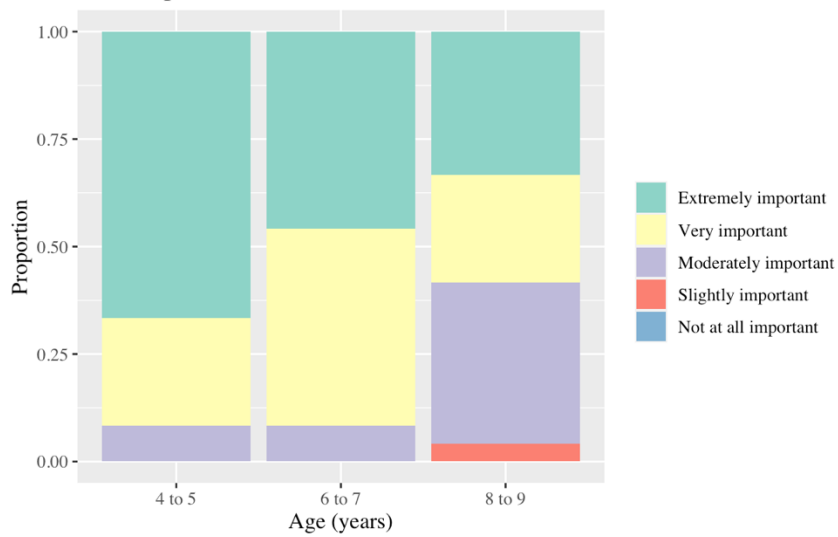




How important do I think children should not to hurt other children (physically)?



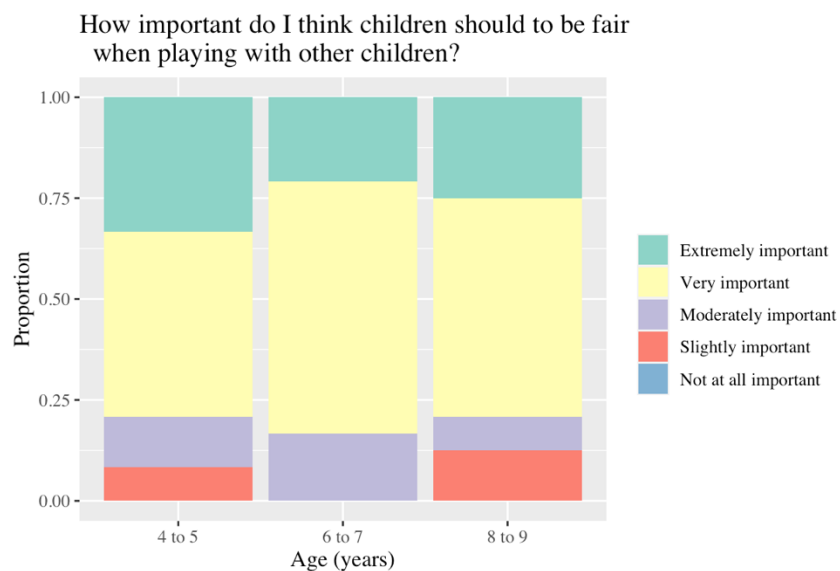
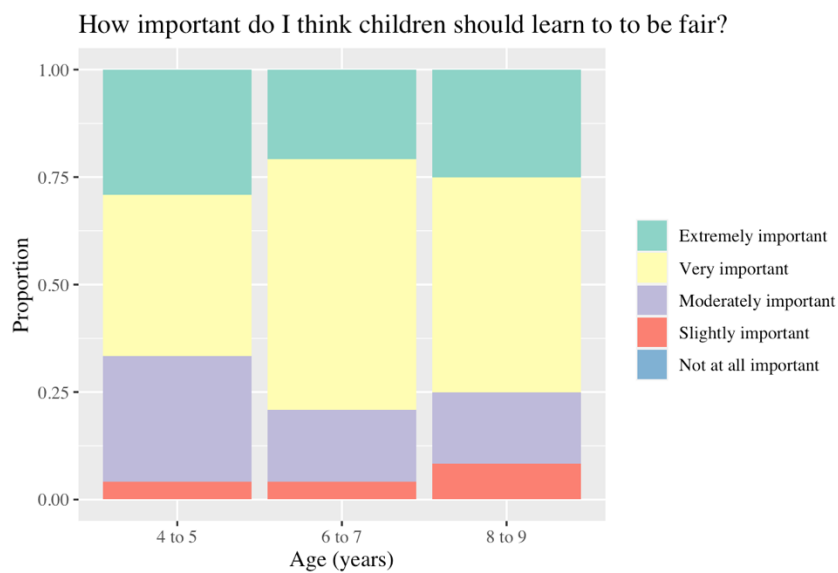
How important do I think children should learn to take care of others?



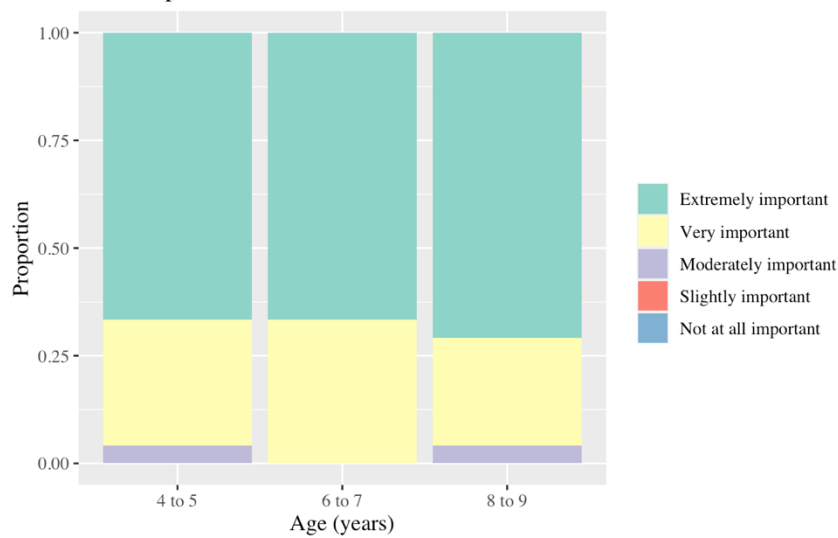
## Appendix H

### *The Proportion of Parent's Responses in the Kärtner Socialization Goals Autonomy*

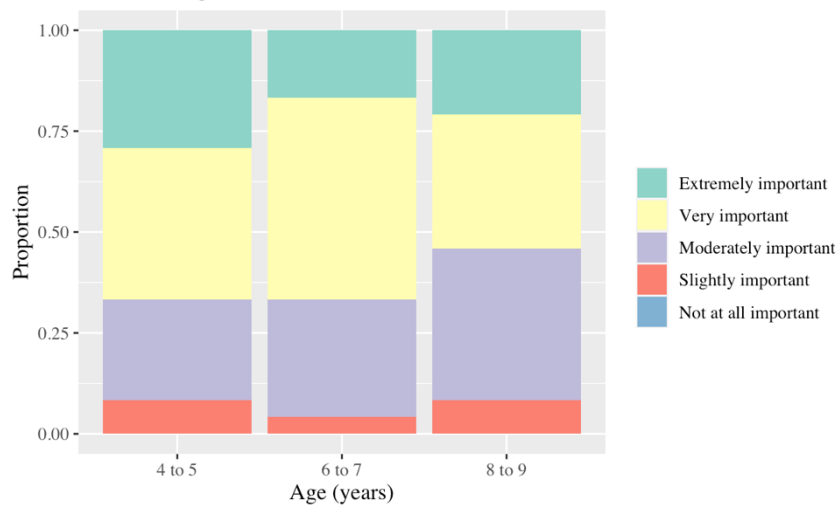
#### *Fairness Subscale*



How important do I think children should learn to be honest?



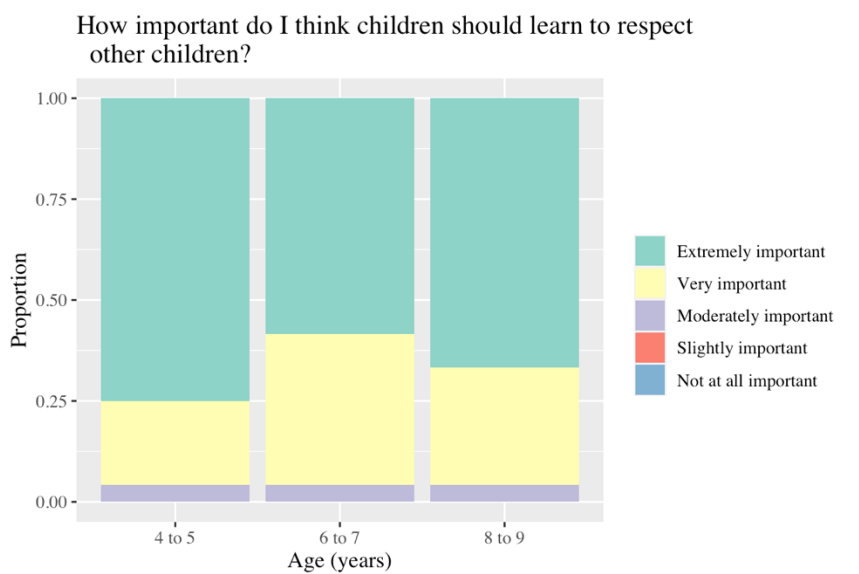
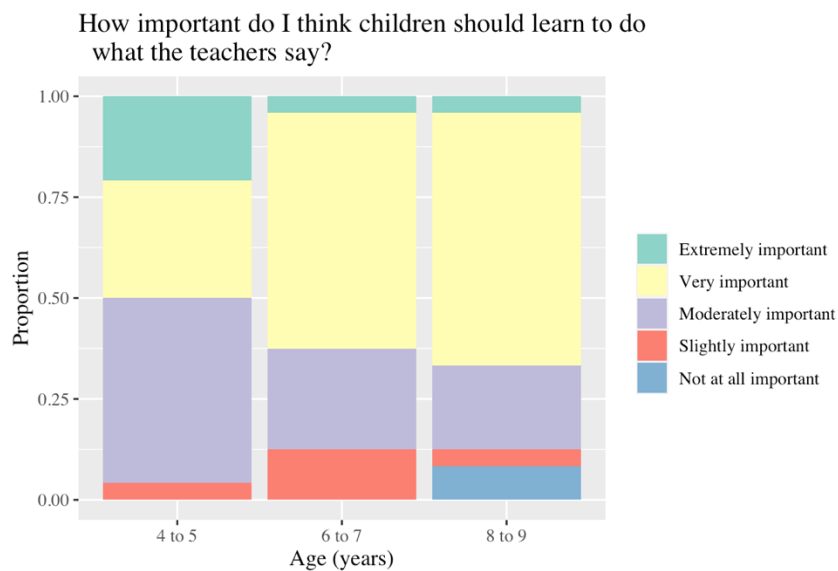
How important do I think children should learn to share things with others?



## Appendix I

### *The Proportion of Parent's Responses in the Kärtner Socialization Goals Community*

#### *Respect Subscale*



## Appendix J

### *The Proportion of Parent's Responses in the Kärtner Socialization Goals Community*

#### *Loyalty Subscale*

