The development of intention-based sociomoral judgment and distribution behavior from a third-party stance

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Abstract
The current study investigated children’s intention-based sociomoral judgments and distribution behavior from a third-party stance. An actor puppet showed either positive or negative intention toward a target puppet, which had previously performed a prosocial or antisocial action toward others (i.e., children witnessed various types of indirect reciprocity). Children (3- and 5-year-olds) were asked to make sociomoral judgments and to distribute resources to the actor puppet. Results showed that 5-year-olds were more likely than 3-year-olds to be influenced by intention when they made their judgment and distributed resources. The target’s previous actions affected only 5-year-olds’ intent-based social preference. These results suggest that children’s judgments about intent-based indirect reciprocity develop from ages 3 to 5 years.

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Introduction
The mechanism of indirect reciprocity and the ability to evaluate social behavior toward third parties are assumed to be the evolutionary and ontogenetic bases of human morality and the cooperative
networks that characterize human societies (Fehr & Fischbacher, 2004; Fry, 2006; Gintis, Henrich, Bowles, Boyd, & Fehr, 2008; Henrich et al., 2005; Nowak & Sigmund, 2005). Moral thinking is argued to be the basis of children’s interpretations of social interactions (Wainryb, Brehl, Matwin, Sokol, & Hammond, 2005). Indirect reciprocity of moral acts means acting positively toward those who are prosocial to third parties and/or negatively toward those who are antisocial to third parties (Nowak & Sigmund, 2005). Young children may engage in indirect reciprocation of moral acts; for example, 3.5- to 4.5-year-olds distribute more resources to a puppet that previously acted prosocially toward others than to a puppet that previously acted antisocially toward others (Kenward & Dahl, 2011; Olson & Spelke, 2008), 5-year-olds punish antisocial adults in an anonymous context (Kenward & Östh, 2015), and 6-year-olds even inflict costly third-party punishment toward unfair proposals (McAuliffe, Jordan, & Warneken, 2015). It appears that children’s own moral and prosocial actions are affected by the recipient’s previous (moral or immoral) behavior toward third parties.

People interact positively with helpful individuals and punish or interact negatively with harmful individuals (Fehr & Gachter, 2002). Selectively prosocial behavior based on the content of previous interactions is regarded as highly beneficial for humans and for human societies due to its effectiveness in maintaining cooperation between unrelated individuals (Dunfield & Kuhlmeier, 2010; Fehr & Fischbacher, 2004; Trivers, 1971). People are motivated to punish individuals who have been harmful in the past (Henrich, 2006). However, research on adults has found that, under some circumstances, harmful acts and antisocial individuals have not been punished but have instead been positively evaluated. Such positivity toward harmful individuals might be because this harmful behavior may be socially evaluated positively if it is directed toward those who are themselves wrongdoers (Hamlin & Wynn, 2011).

Social evaluation in humans often goes beyond analyzing the immediate and local valence of a behavior directed toward another, whereas previous evaluations of a target, which is the global valence of the action, also need to be considered (as illustrated by the common phase “the enemy of my enemy is my friend”) (Aronson & Cope, 1968; Hamlin, Wynn, Bloom, & Mahajan, 2011; Heider, 1958). Even infants (8 months old) can understand that the meaning of an act is influenced not solely by its own value but also by that of its target (Hamlin et al., 2011). Hamlin et al. (2011) found that 8-month-olds selectively preferred individuals who had acted positively toward a prosocial person and who had acted negatively toward an antisocial person. Infants (10 months old) look shorter when the fair distributor is harmed by a third party’s antisocial actions compared with when the unfair distributor is harmed, suggesting that they are able to morally distinguish individuals according to their distribution performance (Meristo & Surian, 2013; Meristo & Surian, 2014). Dahl, Schuck, and Campos (2013) found that 17- and 22-month-old infants equally helped actors who had previously acted prosocially or antisocially, whereas 24-month-old toddlers preferred to help the prosocial actor. These studies mainly focused on infants’ social preference and social behavior based on their understanding of actions.

However, as children grow up, they make mature moral judgments based not only on the outcome of actions but also on the underlying intention (Cushman, 2008; Karniol, 1978; Piaget, 1932/1997; Turiel, 2006). Although the role of outcome in the identification of good social partners is mainly emphasized in traditional models of reciprocity (Hamilton, 1964), others have argued that reciprocity is also influenced by the intention behind an individual’s previous behaviors (Dunfield & Kuhlmeier, 2010; Falk & Fischbacher, 2006; McCabe, Rigdon, & Smith, 2003). It is important for individuals to predict others’ future behaviors by tracking others’ valenced mental states. It seems reasonable to believe that individuals who currently display negative intention are more likely to lead to negative outcomes in the future than those who currently demonstrate positive intention (Hamlin, 2013).

It is argued that intent-based judgments first emerge in children’s evaluation of naughtiness and subsequent judgments of deserved punishment (Cushman, Sheketoff, Wharton, & Carey, 2013). In making moral judgments, 3-year-olds are sensitive to the intention behind an action when stimuli are carefully controlled to remove confounding factors and when the intentional information is explicit and salient (Armsby, 1971; Nelson, 1980; Nobes, Panagiotaki, & Pawson, 2009; Siegal & Peterson, 1998; Yuill & Perner, 1988). A rephrased question is also beneficial by making 4- to 8-year-olds more sensitive to intention (Nobes et al., 2009). It is argued that 3.5-year-olds make moral judgments according to any negative aspects (either negative intention or negative outcome), whereas in the neg-
ative intention/positive outcome condition 4.5-year-olds make intention-based judgments in stories where damage is directed against a person (Moran & O'brien, 1983). Vaish, Carpenter, and Tomasello (2010) found that 3-year-olds not only engaged in less helping behavior toward a harmful target than neutral and helpful targets but also engaged in less helping behavior toward a target who had intended but failed to harm others than toward a neutral target. This suggested that not only actions but also the intention behind those actions may affect an individual’s prosocial behavior.

Moreover, intention-based moral judgment continues to develop between 3 and 11 years of age (Costanzo, Coie, Grumet, & Farnill, 1973; Cushman et al., 2013; King, 1971; Margoni & Surian, 2017). It is argued that, when making moral judgments of others’ actions, children rely more heavily on intent than on outcome as they get older; specifically, compared with younger children, older children are less likely to condemn accidental harm and are more likely to condemn attempted harm despite a benign outcome (Heiphetz & Young, 2014). As stated before, even infants are able to consider the target’s previous moral action when they make social evaluations (Dahl et al., 2013; Hamlin et al., 2011; Meristo & Surian, 2013). We were interested in whether children are able to consider the target’s previous moral action when they make intention-based moral judgments and perform moral behavior as they get older.

Children’s behaviors show an agent-neutral application of moral norms through the third-party paradigm (Vaish et al., 2010). Children as young as 3 years are able to evaluate social acts against third parties by verbally identifying transgressions against social norms (Catron & Masters, 1993; Darley & Shultz, 1990; Ingram & Bering, 2010; Kenward & Dahl, 2011; Sanderson & Siegal, 1988). The capacity of intention understanding based on a third-party perspective might also be expressed in terms of heuristics of the form “If X has displayed a positive intention toward Z in the past, approach X” and “If Y has displayed a negative intention toward Z in the past, avoid Y” (Hamlin et al., 2011). In addition, observation of others’ social interaction helps individuals to escape future harm by systematically avoiding those who have demonstrated malevolent mental states and to gain future benefit by systematically approaching those who have demonstrated benevolent mental states (Hamlin, 2013). It is helpful for individuals to decide who to trust and who to avoid in future social interactions (Bull & Rice, 1991; Cushman, 2015; Noë, 1990).

In this study, these two lines of research—indirect reciprocity and intention-based judgment—were brought together to assess when and how intention behind acts from a third-party stance influences children’s moral judgment and how intention influences children’s own complex social behavior, such as social preference and distributive behavior, toward the actors. It is argued that the complexity of motivational states leads to discrepancies between everyday experience and psychological theorizing (i.e., the cognition–behavior gap) (Kuhl, 1985). For example, children do not always act fairly to others even if they understand principles of fairness by 3 years of age (Blake, McAuliffe, & Warneken, 2014). The reasoned action theory holds that attitude toward the behavior and subjective norms plays an important role in the cognition–behavior gap (Ajzen, 1985). Thus, both sociomoral judgments (here referring to social preference and moral judgment) and moral behavior (here referring to distribution behavior) were simultaneously considered in our study.

At least two studies have demonstrated a high positive correlation between intent-based moral judgment and developmental changes in the theory of mind (Chandler, Sokol, & Hallett, 2001; Killen, Mulvey, Richardson, Jampol, & Woodward, 2011). Moreover, children are able to adapt their understanding of theory of mind to interpret more complex moral situations as they grow older (Smetana, Jambon, Conry-Murray, & Sturje-Apple, 2012). It has been argued that intent-based moral judgment cannot be generated until children are able to represent others’ mental states in sufficiently rich detail (Cushman et al., 2013). Indirect reciprocity also seems to require the ability of “theory of mind” (Whiten & Byrne, 1997). In view of this evidence, 3- and 5-year-olds were recruited for the current study. The study applied a “show-not-tell” approach, in which children watched videos of the interaction between the agent and target and drew their own conclusions.

The current study aimed to investigate the development of intention-based sociomoral judgments and distribution behavior from a third-party stance in preschoolers. The actor interacted positively and negatively, based on both intention and outcome, with the target who previously performed either antisocially or prosocially to others. Children were asked to make sociomoral judgments toward the actor and to distribute resources between the actor and a bystander. Based on the empirical evi-
idence suggesting that intention-based moral judgment continues to develop between 3 and 11 years of age (Costanzo et al., 1973; Cushman et al., 2013; King, 1971; Margoni & Surian, 2017; Nobes et al., 2009), it was predicted that, compared with 3-year-olds, 5-year-olds would rely more on intention than on outcome when making sociomoral judgments and distributing resources. In addition, based on the evidence that 4.5-year-olds, but not 3-year-olds, are much more likely to act positively toward the helper when the resources are scarce (Kenward & Dahl, 2011) and 5-year-olds are able to spontaneously engage in third-party punishment toward antisocial adults (Kenward & Östh, 2015), we hypothesized that, compared with 3-year-olds, 5-year-olds would be more likely to focus on an agent’s intention and to be affected by the third party’s previous action when making sociomoral judgments and distributing resources.

**Method**

**Participants**

Participants were 50 3-year-old children (25 girls; \(M_{\text{age}} = 3.57\) years, SD = 0.16, range = 3.24–3.80) and 51 5-year-old children (25 girls; \(M_{\text{age}} = 5.52\) years, SD = 0.16; range = 5.24–5.76). Of these participants, 25 3-year-olds and 24 5-year-olds were randomly assigned to the prosocial context condition, and 25 3-year-olds and 27 5-year-olds were assigned to the antisocial context condition. Children were recruited from kindergartens in a medium-sized German city and were native German speakers. All children were tested by the same female experimenter.

**Procedure and design**

All children were tested in a quiet room in their kindergartens. They were familiar with the place. Thus, it was easy to warm up, especially for the younger children. The procedure is shown in Fig. 1.

During the warm-up phase, two practice videos were shown to teach children how to use the moral scale. In one of the practice videos, an elephant puppet hit another elephant puppet. In the other one, a penguin puppet shared flowers with another penguin puppet. The children were first introduced to one of the practice videos in order to attract their attention, and then the moral scale was shown and explained to the children. The moral scale showed a very sad face at one end of a line (defined as “completely wrong”), a very happy face at the other end (defined as “completely right”), a neutral face midway (defined as “I do not know or I am not sure”), and a sad face and a happy face between the midpoint and extremes (defined as “a little bit wrong” and “a little bit right,” respectively). The children were told that the sad faces meant that the protagonist did something wrong, and the happy faces meant that the protagonist had acted rightly. Moreover, they were told that the degree of sadness and happiness referred to the degree of wrongness/rightness. Children were told that the very happy (sad) face meant that the agent was completely right (wrong) and that the moderately happy (sad) face meant that the agent was moderately right (wrong). Then the experimenter randomly pointed to the faces and asked children to answer what the faces meant. If children were not able to answer them correctly, the experimenter would give examples involving the children themselves, including toys being snatched by friends as an example of doing wrong and helping friends as an example of doing right. After the children had learned the moral scale, the practice video was played again and they were asked to make a moral judgment about the puppet by using the moral scale. Then the other practice video was played, and the children were also asked to make a moral judgment about the puppet by using the moral scale. Only children who understood and readily used the scale moved forward to the formal test phase.

In the formal test phase, the children were first asked to watch one of the videos about moral stories in the target puppet (second party). The target puppet performed either prosocial or antisocial behavior (more details can be found in the online supplementary material videos). In the prosocial context condition, the target puppet shared candy with the other puppet. In the antisocial context condition, the target puppet hit the other puppet to get a toy. Then four scenarios of interaction between actor puppets (first party) and the target puppet were shown to children (more details can
be found in the online supplementary material videos). Four different combinations of intention and outcome were shown in these four conditions (Hamlin, 2013). First was successful helper, where the actor’s behavior toward the target had a positive intention and a positive outcome. The target wanted to open a box of toys. The actor tried three times to help the target open the box, and the box was opened after the third attempt. The second combination was failed helper, where the actor’s behavior toward the target had a positive intention and a negative outcome. The target wanted to open a box with toys. The actor tried three times to help the target open the box but failed. The third combination was successful hinderer, where the actor’s behavior toward the target had a negative intention and a negative outcome. The target wanted to open a box with toys. The actor tried three times to prevent the target from opening the box, and at the end the box was still closed. The fourth combination was failed hinderer, where the actor’s behavior toward the target had a negative intention and a positive outcome. The target wanted to open a box with toys. The actor tried three times to prevent the target from opening the box, but the box was opened after the third attempt. In these four conditions, a bystander puppet was placed to the side and just watched the interactions between the actor puppet and the target puppet. After each condition, children were asked three questions. First, “Do you think the actor puppet acted rightly or wrongly? Can you show me on the scale?” (moral judgment). Children were asked to show their judgment on the moral scale. Second, “Who do you like more [actor puppet or bystander puppet]?” (social preference). Children were asked to point their finger to the puppet they prefer more. Third, “How many stickers would you like to give to the actor puppet and bystander puppet?” (distribution behavior). Five stickers were given to children, and they were asked to allocate these stickers to the actor puppet and bystander puppet. All five stickers needed to be distributed. Children were asked to put the corresponding stickers in front of the two puppets.

A 2 (Age: 3 years old or 5 years old) * 4 (Condition—type of actor: successful helper, failed helper, successful hinderer, or failed hinderer) * 2 (Social Context—type of target: prosocial or antisocial) design was conducted, in which condition was a within-participant variable and social context was a between-participant variable. Different intentions and outcomes were involved in these four conditions, including positive intention (successful helper and failed helper), negative intention (successful hinderer and failed hinderer), positive outcome (successful helper and failed hinderer), and negative outcome (failed helper and successful hinderer).
A puppet show was used to perform the whole story because even nonviolent antisocial interactions between adult strangers might have shocked many children into inactivity (Vaish, Carpenter, & Tomasello, 2009). Interactions between puppets were recorded as short movies. The puppetry was of a dramatic standard. Drama can arouse emotional responses in children and adults comparable to those triggered by similar real-life events regardless of whether the events are perceived as real or not (Pouliot & Cowen, 2007). Moreover, short movies with puppets can also make the process of interaction more unified than live puppet performances. Rather than explicitly informing children about the status of the potential actors and recipients, a “show-not-tell” approach (Kenward & Dahl, 2011), in which children witness the behavior of potential actors and recipients and draw their own conclusions, was applied in this study.

The procedure was counterbalanced, including (a) the sequence of the four conditions (there are 24 kinds of sequence), (b) which cow puppet was the actor puppet (half of the conditions had the cow puppet with gloves as the actor puppet, and half had the cow puppet without gloves as the actor puppet), (c) the position of the actor puppet in the video (right/left of the target puppet; there are four versions of the video in each condition), and (d) the position of the actor puppet and bystander puppet when children were asked to choose (the target puppet is always in the middle of the actor puppet and the bystander puppet, and there are four versions of the video in each condition). Children were always asked to make a moral judgment toward the actor puppet first. The social evaluation (preference judgment) and resource distribution between the actor puppet and bystander puppet were balanced randomly. The study has been approved by the Max Planck Institute for Evolutionary Anthropology Child Subjects Committee. The study was carried out with the written informed consent of the participants’ parents and in accordance with all applicable laws and rules governing psychological research in Germany.

Results

Children’s moral judgment in helping and harming conditions during the practice phase was analyzed. All children recognized that helping others was right and harming others was wrong ($M_{harming} = -1.77, SD = 0.42; M_{helping} = 1.94, SD = 0.24$), $F(1, 100) = 5355.08, p = .000, \eta^2_p = .98$. There was a significant difference in moral scale of the practice phase between 3-year-olds and 5-year-olds ($M_{3-year-olds} = 0.13, SD = 0.03; M_{5-year-olds} = 0.04, SD = 0.03$), $F(1, 100) = 4.76, p = .031, \eta^2_p = .98$. However, the interaction between age and condition was also significant, $F(1, 100) = 11.39, p = .001, \eta^2_p = .10$. Post hoc simple effect analysis showed that children displayed significant differences with regard to the moral scale between 3-year-olds and 5-year-olds in the harming condition of the practice phase, $F(1, 99) = 10.70, p = .001, \eta^2_p = .10$, but not in the helping condition of the practice phase, $F(1, 98) = 2.95, p = .089, \eta^2_p = .03$.

Children’s moral judgment in different conditions and social contexts

Children’s performance in the moral scale was measured in order to examine their moral judgment about right and wrong (shown in Fig. 2).

The mixed designs of 2 (Age: 3 years old or 5 years old) * 2 (Intention: positive or negative) * 2 (Social Context: prosocial or antisocial) and 2 (Age: 3 years old or 5 years old) * 2 (Outcome: positive or negative) * 2 (Social Context: prosocial or antisocial) were analyzed by the repeated-measures analysis of variance (ANOVA).

The main effect of intention was found to be significant, and post hoc multiple comparisons showed that children were significantly more likely to approve of the actor puppet’s action in the condition of positive intention than in the condition of negative intention, $F(1, 100) = 68.39, p = .000, \eta^2_p = .41$. The interaction between intention and age was significant, $F(1, 100) = 38.46, p = .000, \eta^2_p = .28$, and post hoc simple effect analysis showed that 5-year-olds were significantly more likely to approve of the actor puppet's action in the condition of positive intention than in the condition of negative intention, $F(1, 100) = 105.57, p = .000, \eta^2_p = .52$, whereas 3-year-olds performed similarly in these two conditions, $F(1, 100) = 2.12, p = .149, \eta^2_p = .02$. Compared with 3-year-olds, 5-year-olds were significantly
more likely to approve of the actor puppet’s action in the condition of positive intention, \( F(1, 100) = 11.96, p = .001, \eta^2_p = .11 \), and to disapprove of the actor puppet’s action in the condition of negative intention, \( F(1, 100) = 25.65, p = .000, \eta^2_p = .21 \). The main effect of social context was not significant, neither was the main effect of age, and nor were other interactions.

The main effect of outcome was also found to be significant, and post hoc multiple comparisons showed that children were significantly more likely to approve of the actor puppet’s action in the condition of positive outcome than in the condition of negative outcome, \( F(1, 100) = 35.55, p = .000, \eta^2_p = .27 \). The main effect of social context was not significant, neither was the main effect of age, and nor were other interactions.

**Children’s preference for the actor puppet in different conditions and social contexts**

Children’s preference for the actor puppet is shown in Fig. 3.

A binary logistic regression was performed to examine the effect of age, social context, intention condition, and outcome condition on children’s preference for the actor puppet. Dummy coding of age, social context, intention condition, and outcome condition was done. Prosocial context, negative intention, negative outcome, and 3 years old were coded as reference categories. The model (shown in Table 1) effectively explained children’s preference behavior, \( \chi^2(12) = 35.16, p = .000 \). The interaction between age and intention was found to be significant. Further analyses showed that, compared with 3-year-olds, 5-year-olds were more likely to prefer the actor puppet in the condition of positive intention, Mann–Whitney \( U = 852.50, Z = 2.77, p = .006 \), and less likely to prefer the actor puppet in the condition of negative intention, Mann–Whitney \( U = 831.50, Z = -3.21, p = .001 \). The 5-year-olds were more likely to prefer the actor puppet in the condition of positive intention, \( \chi^2(2) = 6.28, p = .043 \), and less likely to prefer the actor puppet in the condition of negative intention, \( \chi^2(2) = 11.41, p = .003 \), whereas the 3-year-olds demonstrated similar preferences for the actor puppet in both of these conditions [positive intention: \( \chi^2(2) = 5.43, p = .066 \); negative intention: \( \chi^2(2) = 1.96, p = .375 \)].

The interaction between age and social context was also found to be significant. Further analyses showed that (a) in the antisocial context, 3-year-olds were less likely than 5-year-olds to prefer the actor puppet in the condition of positive intention, Mann–Whitney \( U = 200.00, Z = 2.31, p = .021 \), but not in the conditions of negative intention, positive outcome, and negative outcome; and (b) in
the prosocial context, 5-year-olds were less likely than 3-year-olds to prefer the actor puppet in the condition of negative intention, Mann–Whitney \( U = 162.00, Z = -2.96, p = .003 \), but not in the conditions of positive intention, positive outcome, and negative outcome. The 5-year-olds were less likely to prefer the actor puppet in the condition of negative intention in the prosocial context, \( \chi^2(2) = 12.25, p = .002 \), but demonstrated a similar preference for the actor puppet in the condition of positive intention in the prosocial context, \( \chi^2(2) = 3.25, p = .197 \), and in the antisocial context [positive intention: \( \chi^2(2) = 3.31, p = .191 \); negative intention: \( \chi^2(2) = 4.22, p = .121 \)], whereas 3-year-olds demonstrated a similar preference for the actor puppet both in the prosocial context [positive intention: \( \chi^2(2) = 5.84, p = .054 \); negative intention: \( \chi^2(2) = 2.96, p = .228 \)] and in the antisocial context [positive intention: \( \chi^2(2) = 4.00, p = .135 \); negative intention: \( \chi^2(2) = 0.08, p = .961 \)].

Fig. 3. Children’s preference for the actor puppet in different conditions and contexts. “Prosocial” refers to the social context of the prosocial target, and “Antisocial” refers to the social context of the antisocial target. The error bars refer to the standard errors.

Table 1
Regression effect of intention condition, outcome condition, and social context on children’s social preference.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>( \text{Exp}(B) )</th>
<th>( \chi^2 ) (Wald)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-1.65</td>
<td>0.19</td>
<td>9.55</td>
<td>.002</td>
</tr>
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<td>Social Context</td>
<td>-0.55</td>
<td>0.58</td>
<td>1.20</td>
<td>.273</td>
</tr>
<tr>
<td>Intention</td>
<td>-0.66</td>
<td>0.52</td>
<td>2.58</td>
<td>.108</td>
</tr>
<tr>
<td>Age * Social Context</td>
<td>1.47</td>
<td>4.34</td>
<td>3.88</td>
<td>.049</td>
</tr>
<tr>
<td>Age * Intention</td>
<td>2.25</td>
<td>9.47</td>
<td>13.89</td>
<td>.000</td>
</tr>
<tr>
<td>Social Context * Intention</td>
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<td>0.94</td>
<td>0.01</td>
<td>.922</td>
</tr>
<tr>
<td>Outcome</td>
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<td>0.85</td>
<td>0.17</td>
<td>.683</td>
</tr>
<tr>
<td>Age * Outcome</td>
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<td>1.18</td>
<td>0.08</td>
<td>.782</td>
</tr>
<tr>
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<td>0.04</td>
<td>.848</td>
</tr>
<tr>
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<td>0.80</td>
<td>.372</td>
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<tr>
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<td>0.28</td>
<td>1.86</td>
<td>.173</td>
</tr>
<tr>
<td>Age * Social Context * Intention * Outcome</td>
<td>0.85</td>
<td>2.35</td>
<td>1.05</td>
<td>.305</td>
</tr>
</tbody>
</table>
We examined whether young children distributed resources according to the moral valence of the social actions previously observed among the recipients. The difference between stickers for the actor puppet and for the bystander puppet referred to the number of stickers for the actor puppet minus the number of stickers for the bystander puppet. Children’s distribution behavior is shown in Fig. 4.

The mixed designs of 2 (Age: 3 years old or 5 years old) * 2 (Intention: positive or negative) * 2 (Social Context: prosocial or antisocial) and 2 (Age: 3 years old or 5 years old) * 2 (Outcome: positive or negative) * 2 (Social Context: prosocial or antisocial) were analyzed by the repeated-measures ANOVA.

The main effect of intention was found to be significant, and post hoc multiple comparison showed that children significantly distributed more resources to the actor puppet in the condition of positive intention than in the condition of negative intention, $F(1, 100) = 8.22, p = .005, \eta^2_p = .08$. The interaction between intention and age was significant, $F(1, 100) = 12.22, p = .001, \eta^2_p = .11$, and post hoc simple effect analysis showed that 5-year-olds significantly distributed more resources to the actor puppet in the condition of positive intention than in the condition of negative intention, $F(1, 100) = 20.41, p = .000, \eta^2_p = .17$, whereas 3-year-olds performed similarly in these two conditions, $F(1, 100) = 0.20, p = .658, \eta^2_p = .002$. Compared with 3-year-olds, 5-year-olds distributed significantly less resources to the actor puppet in the condition of negative intention, $F(1, 100) = 14.67, p = .000, \eta^2_p = .13$, whereas 5-year-olds performed similarly to 3-year-olds in the condition of positive intention, $F(1, 100) = 3.48, p = .065, \eta^2_p = .04$. The main effect of social context was not significant, neither was the main effect of age, and nor were other interactions.

The main effect of outcome was also found to be significant, and post hoc multiple comparison showed that children significantly distributed more resources to the actor puppet in the condition of negative outcome than in the condition of positive outcome, $F(1, 100) = 5.89, p = .017, \eta^2_p = .06$. Further analysis found that the effect showed only in 5-year-olds ($M_{\text{positive outcome}} = 0.62, SE = 0.22; M_{\text{negative outcome}} = 0.01, SE = 0.22), F(1, 97) = 4.46, p = .037, \eta^2_p = .04$. This might be due to the fact that 5-year-olds allocated few stickers to the actor puppet in the condition of successful helper in the antisocial context. The main effect of social context was not significant, neither was the main effect of age, and nor were other interactions.

**Fig. 4.** Difference between stickers for the actor puppet and the bystander puppet. The mean refers to the number of stickers for the actor puppet minus the number of stickers for the bystander puppet. “Prosocial” refers to the social context of the prosocial target, and “Antisocial” refers to the social context of the antisocial target. The error bars refer to the standard errors.
Discussion

Young children’s ability to identify harmful intentions and behaviors and to analyze agents’ previous behavior toward third parties might be an early step on the way to full-fledged social and moral evaluation (Vaish et al., 2010). This study investigated the development of intention-based sociomoral judgments and distribution behavior from a third-party stance in 3- and 5-year-olds. It was found that (a) preschoolers’ sociomoral judgments and distribution behavior were substantially influenced by intention, and 5-year-olds relied more heavily on intention than 3-year-olds when making sociomoral judgments and distributing resources to the actor puppet in the context of indirect reciprocity; and (b) 5-year-olds were sensitive to social context when they indicated intent-based social preferences in the context of indirect reciprocity.

Children’s development of intention-based sociomoral judgments from a third-party stance

In this study, it was found that both intention and outcome were considered when children made moral judgments. The actor puppet was judged as most wrong in the successful hinderer condition, followed by the failed hinderer, failed helper, and successful helper conditions. An individual’s action in the conditions of negative intention and negative outcome was less likely to be approved by preschoolers. The ability to distinguish good guys from bad guys has been assumed as the foundation of human morality and as being beneficial to group living (De Waal, 2009; Henrich & Henrich, 2007; Price, Cosmides, & Tooby, 2002).

Children made significantly different intent-based sociomoral judgments in the context of indirect reciprocity between 3 and 5 years of age. The 5-year-olds, but not the 3-year-olds, showed significantly intent-based moral judgment and social preferences for the actor puppet. Specifically, compared with 3-year-olds, 5-year-olds demonstrated a greater preference for the actor puppet in the successful helper condition and less preference for the actor puppet in the failed hinderer condition. It has been argued that young children focus on outcome more than older children, that they rely mostly on outcome (Helwig, Hildebrandt, & Turiel, 1995), or that they focus equally on intention and outcome (Cushman et al., 2013). Moreover, intention-based moral judgment continues to develop between 4 and 8 years of age (Cushman et al., 2013), and as they get older children display greater reliance on intent than on outcome when making moral judgments about others’ actions (Heiphetz & Young, 2014). In the cases of failed attempts to hinder and accidental hindrance, punishment of attempted but failed hindrance increases with age (Helwig et al., 1995), whereas punishment of accidental hindrance decreases with age (Cushman et al., 2013; Killen et al., 2011).

Following life history theory, the elicited intent-based moral reasoning emerges roughly at 5 or 6 years of age because children at this age are increasingly involved in social interactions with peers (Margoni & Surian, 2016). To avoid potentially dangerous conflicts, the tendency to attend to agents’ intentions rather than outcomes becomes crucial precisely at this age, when the focus of children’s social life begins to shift from interaction with their parents at home to interaction with peers in school (Marlowe, 2005). The ability to understand and evaluate others’ intentions might be systematically used by children in a variety of social interactions during the later preschool years (Margoni & Surian, 2016). Another alternative explanation is that, children are able to adapt their understanding of theory of mind to interpret more complex moral situations as they grow older (Smetana et al., 2012). Children who pass false belief theory of mind tasks are less likely to attribute negative intention to the accidental harm than children who do not pass false belief tasks (Killen et al., 2011). Moreover, the ETIC (emotional arousal, theory of mind, and inhibitory control) model of morality argues that theory of mind abilities involve the integration of the agent’s harmful or innocent intentions into moral judgment (Buon, Seara-Cardoso, & Viding, 2016). In addition, based on greater awareness of others’ experiences in the context of social interactions, children develop empathic sensitivity during their second and third years of life (Decety, 2010). The empathy network is involved in encoding outcomes (especially harmful outcomes), which makes children more outcome based (Patil, Calò, Fornasier, Cushman, & Silani, 2017). However, this reliance on outcomes declines with development of executive
function that helps children to regulate their emotional reaction and, as a result, increases the influence of intentions on moral decisions (Buon et al., 2016).

Social preference was affected by the target's previous action (prosocial or antisocial behavior toward others) only in 5-year-olds. Regression analysis found that the interaction between age and social context could significantly predict children's social preference for the actor puppet. For example, 5-year-olds were less likely to prefer the actor puppet in the condition of negative intention in the prosocial context, whereas 3-year-olds demonstrated a similar preference for the actor puppet both in the prosocial context and in the antisocial context. This suggests that the capacity for intent-based indirect reciprocity in social preference increased with age. Previous evidence shows that younger children are able to act accordingly based on the target's previous actions. It is argued that children older than 3.5 years are able to perform prosocial behavior according to the agents’ previous (moral or immoral) behavior toward third parties (Kenward & Dahl, 2011; Olson & Spelke, 2008). However, more complicated context was set in our study; specifically, the agent showed either positive or negative intention toward a target puppet that had previously performed a prosocial or antisocial action toward others (i.e., children witnessed various types of indirect reciprocity). It is argued that criteria, including the victim's and children's relationship with the transgressor (Wellman, Larkey, & Somerville, 1979) and the context of the transgression (Killen, 2007; Smetana, 2006) are involved in individuals' considerations when they make social and moral evaluations. Thus, it is reasonable to infer that a higher level of cognitive load (e.g., a higher level of theory of mind) is required in our study so that children's social preference was influenced by the target's previous action until 5 years of age.

In addition, the effect of social context was mixed in young children. For example, in the condition of positive intention, 5-year-olds showed significantly greater preference for the actor puppet than 3-year-olds in the antisocial context but not in the prosocial context. This might be because second-order theory of mind applied when children made intent-based sociomoral judgments from the third-party perspective in this study. Indirect reciprocity seems to require the ability of theory of mind (Whiten & Byrne, 1997). Judging moral actions between third parties as “good” or “bad,” distinct from judging an organism’s own moral experiences as “good” or “bad,” requires a higher degree of empathy and developed abilities of cognition (refers to sophisticated theory of mind) (Martin & Sigmund, 2005). Theory of mind may facilitate individuals in making moral judgments in the context of indirect reciprocity. In addition, a close relationship is evident between intent-based moral judgment and developmental changes in theory of mind (Chandler et al., 2001; Cushman et al., 2013; Killen et al., 2011). Although nearly half of 4.7-year-olds and all 6.0-year-olds are able to attribute second-order false beliefs (Sullivan, Zaitchik, & Tager-Flusberg, 1994), successfully passing first- or second-order false belief tasks does not mean that individuals are able to deploy the ability of theory of mind. Empirical evidence shows that many players, even adults, are restricted to adopting first-order ability to reason others’ actions, and nearly all players are restricted to making second-order reasoning (Colman, 2003; Hedden & Zhang, 2002; Verbrugge & Mol, 2008). Keysar, Lin, and Barr (2003) also argued that there was an obvious discrepancy between the ability to thoughtfully distinguish one’s own beliefs from others’ beliefs and effectively using this ability to interpret others’ action, suggesting that even adults are not able to fully deploy the sophisticated theory of mind to interpret the actions of others.

Children’s development of intention-based distribution behavior from the third-party perspective

It was found that 5-year-olds, but not 3-year-olds, distributed significantly different amounts of stickers to the actor puppet and the bystander puppet in four conditions. Specifically, 5-year-olds distributed fewer stickers to the actor puppet than 3-year-olds in the negative intention conditions. This suggested that 5-year-olds’ distribution behavior from a third-party stance was more likely to be affected by intention than that of 3-year-olds. The results were similar to previous findings. It has been argued that most 4.5-year-olds already justify their unequal distributions based on the recipients’ moral behavior (Kenward & Dahl, 2011). In addition, children of this age recognize that moral transgressors deserved punishment (Smetana, Schlagman, & Adams, 1993). These results suggest that 4.5-year-olds are able to understand that morally valenced behaviors should be indirectly reciprocated.
In addition, it was found that children distributed more resources to the actor puppet in the condition of negative outcome than in the condition of positive outcome, and further analysis showed that the effect showed only in 5-year-olds. This might be due to the fact that 5-year-olds allocated fewer stickers to the actor puppet in the condition of successful helper in the antisocial context. According to the ETIC model of morality, children's reliance on outcomes declines with age and older children rely more on intentions when they make moral judgments and perform moral behavior such as distributing resources for others in our study (Buon et al., 2016).

However, the target's previous action, here referred to as the prosocial/antisocial context, did not affect young children's distribution behavior in this study. It is difficult for children younger than 6 years to distribute resources based on explicit reasoning concerning moral principles of indirect reciprocity (Arsenio & Kramer, 1992; Kenward & Dahl, 2011). In addition, the effect of sociomoral judgments on distribution behavior might be mediated by a more complicated process as opposed to simply liking the positive action or intention. Young children may begin to understand the rule that morally valenced behavior should be indirectly reciprocated (Kenward & Dahl, 2011). It might be difficult for young children to apply such reasoned moral principles.

The main effect of social context was not significant overall in all three tasks, whereas the interaction between age and social context was found only in the social preference task but not in the moral judgment and distribution tasks. This showed that young children already perform indirect reciprocity of intent-based behaviors when making social preference, and 5-year-olds' social preference might be more sensitive to social context. This is probably due to the fact that moral judgment and resource distribution tasks are elicited response tasks. Apart from representing an actor's intention and the recipient's outcome, elicited response intention–outcome tasks also require individuals to hold competing pieces of information in mind simultaneously, select one piece of information to rely on, and inhibit a presumably dominant response based on real-world outcomes; thus, it may be difficult for young children to perform better in elicited response tasks (Hamlin, 2013). For example, in this study, children needed to represent the agent's intention and the target's previous behavior simultaneously when they made moral judgments and distributed resources. Comparatively, puppet choice in the social preference task might be relatively insensitive to the factors that hamper children's performance in elicited response tasks. Moreover, puppet choice might help to trigger an implicit form of evaluation (Hamlin, 2013).

Another alternative explanation for the above result is offered by social intuitionist models, which claim that even adults' moral judgment can be influenced by intuitive processes without reasoning and that these models are supported by a nonreasoned mechanism for indirect reciprocity of moral behaviors (Cushman, Young, & Hauser, 2006; Haidt, 2007; Krebs & Denton, 2005). According to social intuitionist models for moral cognition, adults' moral judgments are affected by intuitive processes (Cushman et al., 2006; Haidt, 2001; Krebs & Denton, 2005). Our results raise the possibility that young children's mechanism for indirect reciprocity, sociomoral judgments, and distribution behavior might be developmentally continuous with similar intuitive processes in adults.

It was found that young children were more likely to focus on negative intention and negative outcome, and the tendency increased with age. First, in the condition of negative intention, 5-year-olds showed significantly less preference for the actor puppet than 3-year-olds in a prosocial context but not in an antisocial context. Second, 5-year-olds distributed significantly fewer stickers to the actor puppet than 3-year-olds in the condition of negative intention but distributed similar amounts in the helper conditions. It has been shown that negative intentions and outcomes were very salient to 3- and 5-year-olds. This is in line with other findings suggesting that negative events are more salient to young children than positive ones (Vaish, Grossmann, & Woodward, 2008). Children as young as 3 years already perform less helping behavior toward individuals who harm or intend to harm a third party, suggesting that the ability to recognize harmful or intentionally harmful individuals and withhold help from them emerges early on during childhood (Vaish et al., 2010). Kenward and Dahl (2011) also argued that 3-year-olds are afraid of the hinderer, meaning that the negative actions are so strong that a child's memory of a hinderer's identity might be weakened.

The findings that children, or at least 5-year-olds, are able to adjust their sociomoral judgments and complex social behavior toward individuals according to the moral valence of the individuals' actions toward third parties with different moral valences suggest that similar behavior might be observed in
preschoolers' everyday social interactions with others. In other words, indirect reciprocity based on a third party's previous behavior has emerged in preschoolers. Indirect reciprocity has been shown to be important and meaningful in promoting cooperative social interactions (Nowak & Sigmund, 2005). Thus, the findings observed here might be effective in reducing moral transgressions in preschoolers’ social interactions.

There is one limitation that should be addressed. The actor helped the target to open the box together in conditions of positive intention. Collaboration is involved and mixed with help behavior in this condition. Thus, children’s positive evaluation of the actor as the helper might be partly due to the actor taking part in cooperative actions. Future work should deploy help behavior with only individual effort involved in order to discriminate help from collaboration.

Conclusion

This study examined the development of intention-based sociomoral judgments and distribution behavior from the third-party stance in 3- and 5-year-old children. It showed that preschoolers’ moral judgment and distribution behavior was substantially influenced by intention; moreover, compared with 3-year-olds, 5-year-olds relied more heavily on intention when making moral judgments and distributing resources. These results suggest that young children’s sociomoral judgments and distribution behavior are increasingly influenced by intention from 3 to 5 years of age. Although social context (here referring to the target’s previous action) did not affect young children’s intent-based moral judgment and distribution behavior, 5-year-olds already performed indirect reciprocity of intent-based behaviors when making social preference. These results suggest that children’s judgments about intent-based indirect reciprocity develop from 3 to 5 years of age.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.jecp.2017.09.021.

References


