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The development of intent-based moral judgment and moral behavior in the context of indirect reciprocity: A cross-cultural study

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Abstract

The current study aimed to investigate the cultural differences in the developmental origins of children's intent-based moral judgment and moral behavior in the context of indirect reciprocity. To this end, we compared how German and Chinese children interpret and react to antisocial and prosocial interactions between puppets. An actor puppet performed either a positive or negative act toward a prosocial or antisocial target puppet with the intention to cause harm or not; 197 three and five-year-old children participated as a third party and were asked to judge the actor puppet's behavior and to distribute stickers. Results showed that 3-year-old Chinese children were able to take intention and context into account when making moral judgments and distributing resources, whereas German children did not show sensitivity to intention until the age of 5. These findings suggest that culture may mediate children's intent-based moral judgment and moral behavior in the context of indirect reciprocity.

Keywords

Intention, indirect reciprocity, moral judgment, distribution; cultural differences; relation-oriented

Introduction

There has been a consistent research interest in how children distinguish prosocial from antisocial individuals and in how this ability becomes more complex with age and the adoption of a moral code. To survive, human infants must quickly learn to assess the actions and intentions of others to determine who can help them and who may hurt them (Hamlin & Wynn, 2011; Hamlin et al., 2007). The ability to discriminate between friend and foe serves as the foundation for cooperation (Buon et al., 2014). In social interactions, observing how a potential social partner treats others may help us determine how they would treat us (Hamlin & Wynn, 2011). This principle of social interactions is known as indirect reciprocity, the tendency to reward those who help others (Kato-Shimizu et al., 2013; Olson & Spelke, 2008). If we see a stranger help an unrelated third party, we are likely to regard the stranger as a helper and reward him or her for it. Indirect reciprocity is assumed to be one of the pillars of human morality and the cooperative networks that characterize human societies (Fehr & Fischbacher, 2004; Gintis et al., 2008; Nowak & Sigmund, 2005). Indirect reciprocity promotes selective cooperation on the basis of social norms distinguishing morally good partners from bad (Sasaki et al., 2017).

During the preschool period, children experienced a transition from making moral judgments based more on outcome—or giving equal weight to outcome and intention—to focusing on the underlying intention (Margoni & Surian, 2016; Nobes et al., 2016). Van de Vondervoort and Hamlin (2018) presented 3- and 4-year-old children a puppet show in which the actor puppets with different intentions helped or hindered the target puppets and caused positive or negative outcomes. Children were asked to make moral judgments about the actor puppets. They found that both 3- and 4-year-old children judged actor puppets with positive intentions as nicer and puppets with negative intentions as worth of punishment. However, compared with 4-year-old children, 3-year-old children's responses were less consistent when the harmful intention of the actor puppets was ambiguous. In addition, 4-year-old children preferred the successful helper to failed hinderer despite that both puppets brought about positive outcomes, whereas 3-year-old children showed no preference for either puppet. Kenward and Dahl (2011) presented children a puppet show in which a puppet grappled with achieving its goal and was helped by a second puppet but hindered by a third puppet. Results showed that 4.5-year-old children tended to distribute more resources to a helper rather than a hinderer when resources were scarce, whereas 3-year-olds allocated resources equally. Cushman et al. (2013) found that 4-year-old children had difficulty in giving more weight to caused harm when making punishment judgment compared with naughtiness judgment. Van de Vondervoort and Hamlin (2017) also found that 4- and 5-year-old children distinguished the morally good

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from the morally bad, preferring the helper and allocating more punishment to the hinderer, whereas 3-year-olds failed to do so. It is thus possible that intent-based moral judgment of harming agents emerges between 3 and 5 years.

Although we prefer prosocial individuals, we make situation-based analyses when making moral judgments and acting morally (Hamlin et al., 2011; Koenig et al., 2019). For example, when the recipient of an action is antisocial, prosocial acts toward the recipient are probably seen as inappropriate (Hamlin et al., 2011). In social evaluations, individuals not only analyze the agent's behaviors directed toward the recipient but also evaluate the recipient's previous behaviors toward a third party. Even 8-month-old infants selectively prefer agents who helped prosocial recipients and agents who acted negatively to antisocial recipients (Hamlin et al., 2011). A recent study by Li and Tomasello (2018) manipulated the intention of agents and the behavior of recipients (prosocial/antisocial) to examine how the ages of 3 and 5 German children judge the agents' behaviors. They found that German 3-year-olds prioritized outcome over intention and failed to take into consideration the recipient's previous behaviors when making moral judgments and distributing resources, while 5-year-old children tended to allocate resources consistent with intent-based moral judgment.

Morality is a distinct domain of social knowledge (Smetana, 2006; Smetana et al., 2014). Social conventions and norms that determine whether a behavior is appropriate or not are contextually relative (Smetana, 2006). Mounting evidence suggests that the development of moral cognition and moral behavior varies by culture (Cowell et al., 2017; Sachdeva et al., 2011). Cultural differences in moral judgments suggest that to understand the bases of moral evaluation, we must abandon the assumption that moral judgments are based on features of actions (whether they are good or bad) independent of the social relational contexts in which they occur (Gummerum & Keller, 2012; Rai & Fiske, 2011). This means that we must keep in mind that individuals' values, obligations, and responsibilities are shaped by the social relational contexts. For instance, Keller et al. (1998) examined social-moral reasoning of children and adolescents in Iceland and mainland China and found that Icelandic children and adolescents focused more on self-interest and contractual concerns, while Chinese participants paid more attention to altruistic and relationship concerns. Therefore, we must rethink moral psychology as embedded in social relational cognition, and thereby moral judgments and behaviors are influenced by particular types of social relationships (Rai & Fiske, 2011).

As findings of the development of intent-based moral judgment and moral behavior in the context of indirect reciprocity are mainly based on Western cultures, we were interested in whether there are cross-cultural differences in the developmental origins of intent-based moral judgments and moral behavior. Despite many cross-cultural studies on moral evaluation (Gibbs et al., 2007; McNamara et al., 2018; Purzycki et al., 2018; Robbins et al., 2017), these studies mainly focus on how people from various cultural background judge intentional actions. Little is known about when children begin to make intent-based moral judgments in the context of indirect reciprocity across cultures. In the present study, we considered whether a relation-oriented collectivistic culture, Chinese culture would mediate the development of intent-based moral judgment and moral behavior in the context of indirect reciprocity.

China is a relation-oriented society in which personal connection plays an important role in social and economic life. The Chinese character *guanxi* (personal relationship or social connection) is defined as relationships or social connections established through favor exchanges between partners, characterized by mutual benefits and interests (Zhang & Hong, 2017). *Guanxi* is deeply rooted in Confucian culture, which emphasizes interpersonal relationships (Wang & Rowley, 2017). Indirect reciprocity provides a critical channel for Chinese people to establish their social network.

Moreover, context culture may affect moral judgment and moral behavior as well. In high-context cultures, people tend to convey their messages in an implicit and indirect way. Thus, in order to understand the message, communicators have to consider the relationship, context, or nonverbal cues of the conversation (Guan et al., 2009; Hall, 1998). In low-context cultures, however, communicators usually present information clearly and explicitly. China is a high-context country in which the meaning of a message sometimes can only be inferred from the context, and a distinctive characteristic of Chinese communication is its implicitness (Fang & Faure, 2011; Gao & Tingtoomey, 1998), whereas Germany is a relatively individualistic country featuring independent self-construal (Beilmann et al., 2014) and falls at the low-context end of continuum of context cultures (Gudykunst & Nishida, 1986; Hall, 1976). The striking differences between China and Germany may provide a good opportunity to investigate the influence of culture on children's understanding of moral concepts. Given that culture guides children in how to perceive, evaluate, understand, and explain events (Wang, 2018), we hypothesized that Chinese children growing up in a relation-based and high-context culture might be able to make intent-based moral judgment and moral behavior in the context of indirect reciprocity even when they are very young.

Therefore, this study investigated cultural differences in the developmental origins of intent-based moral judgment and moral behavior in the context of indirect reciprocity between Chinese children and German children. On the basis of the German sample we examined in a previous study (Li & Tomasello, 2018), we incorporated 3- and 5-year-old Chinese children in the present study, aiming to explore how a relation-oriented culture, like Chinese culture, navigates children's moral judgment and moral behavior.

Method

Participants

Chinese participants were 48 three-year-old children (23 girls, M_{age} = 3.60 years, SD = 0.20, range = 3.00–3.88) and 48 five-year-old children (23 girls, M_{age} = 5.56 years, SD = 0.21, range = 5.14–5.88). Children were recruited from kindergartens in Baoding, a medium-sized city in Hebei province, China, and they were native speakers. The German comparison group consisted of 50 three-year-old children (25 girls, M_{age} = 3.57 years, SD = 0.16, range = 3.24–3.80) and 51 five-year-old children (25 girls, M_{age} = 5.52 years, SD = 0.16, range = 5.24–5.76; previously published in Li & Tomasello, 2018). Children were recruited from kindergartens in a medium-sized German city and were native German speakers.

Prior to testing, an experimenter informed the parent about the experimental procedure and obtained informed consent. The study has been approved by Institute of Psychology, Chinese Academy of Sciences Child Subjects Committee.

Procedure

Materials and procedures in the current study are identical to those used in Li and Tomasello (2018). During the warm-up phase, a well-trained experimenter who was blind to the purpose of the study

showed children two practice videos to ensure they knew how to use the moral scale. In the practice videos, a puppet acted prosocially or antisocially to another puppet. After showing the videos, the experimenter introduced the moral scale to children. The scale consisted of the following series of faces from left to right: a very sad face (defined as "completely wrong"), a sad face (defined as "a little bit wrong"), a neutral face (defined as "I do not know or I am not sure"), a happy face (defined as "a little bit right"), and, finally, a very happy face (defined as "completely right"). The experimenter explained the meaning of each face to children and told children that happy faces meant the actor puppet acted rightly and sad faces meant that the actor puppet acted wrongly. In addition, children were told that the degree of sadness and happiness referred to the degree of wrongness and rightness of the actor puppet's behavior. Then the experimenter pointed to one of the faces randomly and asked children what the face meant to ensure children really understand the meaning of the moral scale. Only children who gave the correct answer participated in the following experiment (e.g., if the experimenter pointed to the very happy face, the children had to say that it means the agent was completely right). If children gave the wrong answer, the experimenter would explain the meaning of faces to children a second time. After the children had given the exact meaning of the face, they were shown practice videos again and were requested to evaluate the actor puppet's behavior by using the moral scale. There were no correct answers this time and children's answers reflected their understanding of the prosocial or antisocial behaviors of the actor puppets in the practice videos.

During the test phase, children were first shown a video in which a target puppet behaved either prosocially (sharing food) or antisocially (hitting others). Then children watched four events in which an actor puppet either successfully or unsuccessfully helped or hindered the target puppet to open a box over three attempts (shown in Figure 1). A bystander puppet who served as a baseline watched the other puppets interact. Four combinations of intention and outcome led to four experimental conditions. The actor puppet played four roles: (1) a successful helper who had a positive intention and yielded a positive outcome, (2) a failed helper who had a positive intention but yielded a negative outcome, (3) a successful hinderer who had a negative intention and yielded a negative outcome, and (4) a failed hinderer who had a negative intention but yielded a positive outcome. After watching the video of each condition, children would be asked two questions by the experimenter. First, "Do you think the actor puppet acted rightly or wrongly? Can you show me on the scale?" Second, "How many stickers would you like to give to the actor puppet and bystander puppet?" Children were given five stickers and asked to distribute all five stickers to the actor puppet and the bystander puppet. To avoid the influence of the experimenter's voice and facial expression on children's responses, all children were interviewed by the same experimenter through the experiment.

The following details were counterbalanced: (1) the sequence of the four conditions, (2) the position of the actor puppet in the video (right/left of the target puppet), (3) the actor puppet was played by a cow puppet with or without gloves, and (4) the position of the actor puppet and bystander puppet when children were asked to choose.

Design

In this study, we adopted a 2 (nation: China and Germany) × 2 (context: prosocial and antisocial) × 4 (condition: successful helper, failed helper, successful hinderer, and failed hinderer) × 2 (age: 3-year-old and 5-year-old) design to examine the cross-cultural differences in intent-based moral judgment and moral behavior, with condition as a within-subject factor and context, nation and age as between-subject factors.

Results

Children's moral judgments in the helping and harming conditions during the warm-up phase were analyzed. All children recognized that helping others was right and harming others was wrong, $F(1, 198) = 7{,}655.35$, $p < .001$, $\eta^2_{\text{partial}} = .97$, confidence intervals (CIs) [.97, .98].

Moral Judgment in Chinese and German Children

Chinese and German children's performance in the moral evaluation task was measured to examine cross-cultural differences in the intent-based moral judgment about right and wrong in the context of indirect reciprocity (shown in Figure 2).

A mixed-repeated measures analysis of variance (ANOVA) was conducted. The main effect of condition was found to be significant, $F(1, 196) = 259.26$, $p < .001$, $\eta^2_{\text{partial}} = .57$, CI [.49, .63]. The interaction between condition and nation was significant, $F(1, 196) = 49.82$, $p < .001$, $\eta^2_{\text{partial}} = .20$, CI [.12, .28], as was the interaction between condition and age, $F(1, 196) = 8.65$, $p < .001$, $\eta^2_{\text{partial}} = .04$, CI [.01, .10].

All of these results must be interpreted within the context of a significant interaction among condition, age, and nation, $F(1, 196) = 20.73$, $p < .001$, $\eta^2_{\text{partial}} = .10$, CI [.04, .16]. Post hoc simple effect analysis showed that compared with 3-year-old German children, 3-year-old Chinese children tended to approve of the actor puppet's behavior more often in the conditions of successful helper and failed helper, successful helper: $F(1, 96) = 22.91$, $p < .001$, $\eta^2_{\text{partial}} = .19$, CI [.09, .30]; failed helper: $F(1, 96) = 56.67$, $p < .001$, $\eta^2_{\text{partial}} = .37$, CI [.25, .47], and to disapprove of the actor puppet's behavior more often in the conditions of successful hinderer and failed hinderer, successful hinderer: $F(1, 96) = 11.82$, $p = .001$, $\eta^2_{\text{partial}} = .11$, CI [.03, .21]; failed hinderer: $F(1, 96) = 81.81$, $p < .001$, $\eta^2_{\text{partial}} = .46$, CI [.34, .55]. Compared with 5-year-old German children, 5-year-old Chinese children tended to approve of the actor puppet's behavior more often in the condition of failed helper, $F(1, 98) = 22.91$, $p < .001$, $\eta^2_{\text{partial}} = .19$, CI [.08, .30], and to perform similarly in the other three conditions. Moreover, 5-year-old German children tended to approve of the actor puppet's behavior more often than 3-year-old German children in the conditions of successful helper and failed helper, successful helper: $F(1, 100) = 11.73$, $p = .001$, $\eta^2_{\text{partial}} = .11$, CI [.03, .20]; failed helper: $F(1, 100) = 12.23$, $p = .001$, $\eta^2_{\text{partial}} = .11$, CI [.03, .21], and to disapprove of the actor puppet's behavior more often in the conditions of successful hinderer and failed hinderer, successful hinderer: $F(1, 100) = 9.90$, $p = .002$, $\eta^2_{\text{partial}} = .09$, CI [.02, .19]; failed hinderer: $F(1, 100) = 46.71$, $p < .001$, $\eta^2_{\text{partial}} = .32$, CI [.20, .42], whereas there were no significances in approving of the actor puppet's behavior between 3-year-old and 5-year-old Chinese children in all the four conditions. These results suggest that compared with 3-year-old German children, 3-year-old Chinese children were more likely to approve of other's behavior in the conditions with positive intention (helper conditions) and to disapprove of other's behavior in the conditions with negative

Figure 1. Video Clips of the Puppet Show.

intention (hinderer conditions), while 5-year-old German and Chinese children performed similarly when making moral judgments in the context of indirect reciprocity.

There was also a significant interaction between condition and context, $F(1, 196) = 2.96$, $p = .032$, $\eta^2_{\text{partial}} = .02$, CI [.00, .05], and post hoc simple effect analysis showed that in the condition of successful helper, children may approve of the actor puppet's behavior more often in the prosocial context than in the antisocial context, $F(1, 196) = 6.90$, $p = .009$, $\eta^2_{\text{partial}} = .04$, CI [.004, .08], whereas in the other three conditions, there were no significant differences in approving of the actor puppet's behavior between the two social contexts.

To further investigate whether children tend to prioritize intention over outcome when making moral judgments, we combined the four conditions into positive (successful helper and failed helper) and negative (successful hinderer and failed hinderer) intention conditions. The main effect of intention was found to be significant, $F(1, 196) = 443.63$, $p < .001$, $\eta^2_{\text{partial}} = .70$, CI [.64, .74]. The interaction between intention and nation was significant, $F(1, 196) = 72.41$, $p < .001$, $\eta^2_{\text{partial}} = .27$, CI [.19, .35], as was the interaction between intention and age, $F(1, 196) = 12.79$, $p < .001$, $\eta^2_{\text{partial}} = .06$, CI [.02, .12].

All of these results must be interpreted within the context of a significant interaction among intention, age, and nation, $F(1, 196) =$

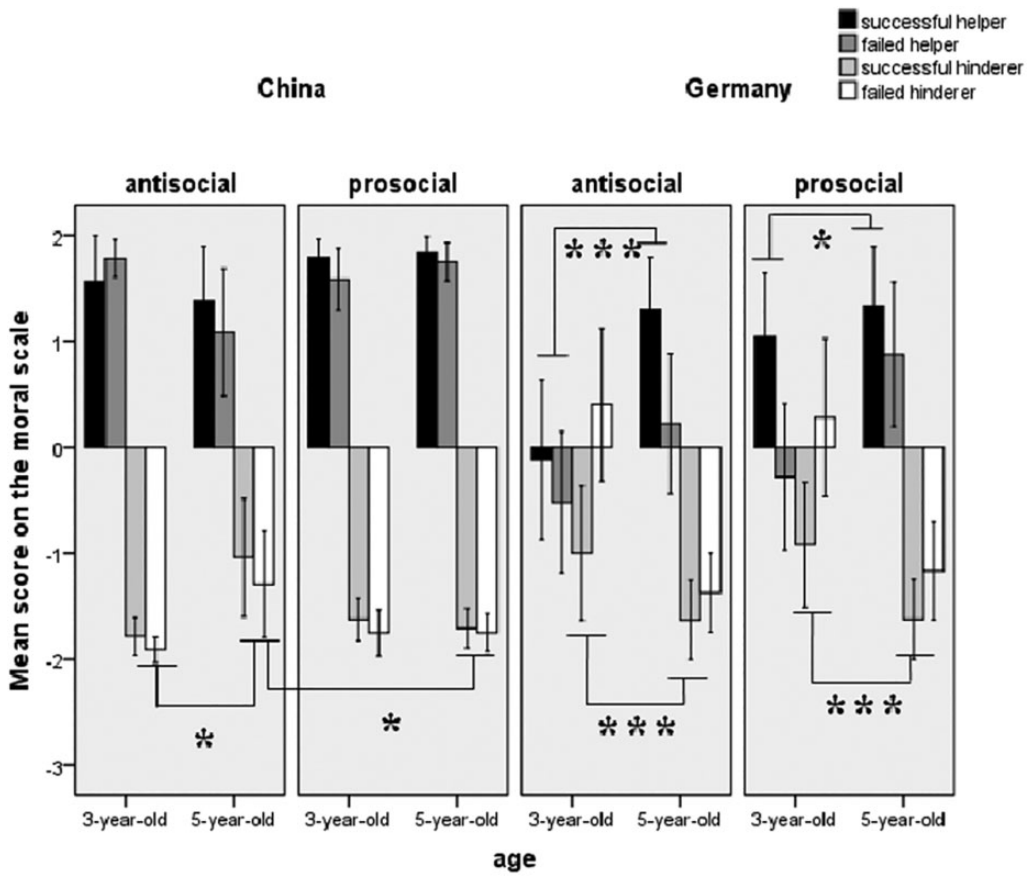

Figure 2. Chinese and German Children's Performance in the Moral Scale for Different Conditions and Contexts.
Note. There were 96 Chinese children and 101 German children. The error bars refer to the standard errors.
*$p < .05$. ***$p < .001$.

34.08, $p < .001$, $\eta^2_{\text{partial}} = .15$, CI [.08, .22]. Post hoc simple effect analysis showed that in the positive intention condition, both 3-year-old and 5-year-old Chinese children tended to approve of the actor puppet's behavior more often compared with German children, 3-year-old: $F(1, 97) = 55.17$, $p < .001$, $\eta^2_{\text{partial}} = .36$, CI [.24, .46]; 5-year-old: $F(1, 98) = 6.91$, $p = .009$, $\eta^2_{\text{partial}} = .07$, CI [.01, .16]. Moreover, 5-year-old German children tended to approve of the actor puppet's behavior more often than 3-year-old German children, $F(1, 100) = 17.13$, $p < .001$, $\eta^2_{\text{partial}} = .15$, CI [.05, .25], while there was no significant difference between 3-year-old and 5-year-old Chinese children. In the negative intention condition, 3-year-old Chinese children were more likely than 3-year-old German children to disapprove of the actor puppet's behavior, $F(1, 97) = 56.96$, $p < .001$, $\eta^2_{\text{partial}} = .37$, CI [.24, .47], whereas there was no difference between 5-year-old German and Chinese children. These results suggest that 3-year-old Chinese children were able to rely more on intention, whereas 3-year-old German children relied more on outcome when making moral judgments in the context of indirect reciprocity.

There was also a significant interaction between intention and context, $F(1, 196) = 5.00$, $p = .026$, $\eta^2_{\text{partial}} = .03$, CI [.002, .07], and post hoc simple effect analysis showed that in the condition of positive intention, children may approve of the actor puppet's behavior more often in the prosocial context than in the antisocial context, $F(1, 196) = 6.71$, $p = .010$, $\eta^2_{\text{partial}} = .03$, CI [.004, .08], whereas in the condition of negative intention, children tended to disapprove of the actor puppet's behavior regardless of the social context, $F(1, 196) = 0.34$, $p = .559$, $\eta^2_{\text{partial}} = .002$, CI [.00, .02]. To summarize, compared with the antisocial context, children would be more likely to approve of the actor puppet's behavior in the prosocial context when the actor puppet's intention was positive. However, whether the context was prosocial or antisocial, children would tend to disapprove of the actor puppet' behavior when the actor puppet's intention was negative. These results indicate that children's intent-based moral judgment may be mediated by context.

Moral Behavior in Chinese and German Children

Chinese and German children's performance in the resource distribution task was measured to examine cross-cultural differences in the intent-based moral behavior in the context of indirect reciprocity (shown in Figure 3).

A mixed repeated measures ANOVA was conducted. The main effect of condition was found to be significant, $F(1, 196) = 39.88$, $p < .001$, $\eta^2_{\text{partial}} = .17$, CI [.10, .25]. The interaction between condition and nation was significant, $F(1, 196) = 8.36$, $p < .001$, $\eta^2_{\text{partial}} = .04$, CI [.01, .09], as was the interaction between condition and age, $F(1, 196) = 4.90$, $p = .002$, $\eta^2_{\text{partial}} = .03$, CI [.001, .07].

All of these results must be interpreted within the context of a significant interaction among condition, age, and nation, $F(1, 196) = 4.71$, $p = .003$, $\eta^2_{\text{partial}} = .02$, CI [.001, .07]. Post hoc simple effect analysis showed that compared with 3-year-old German children, 3-

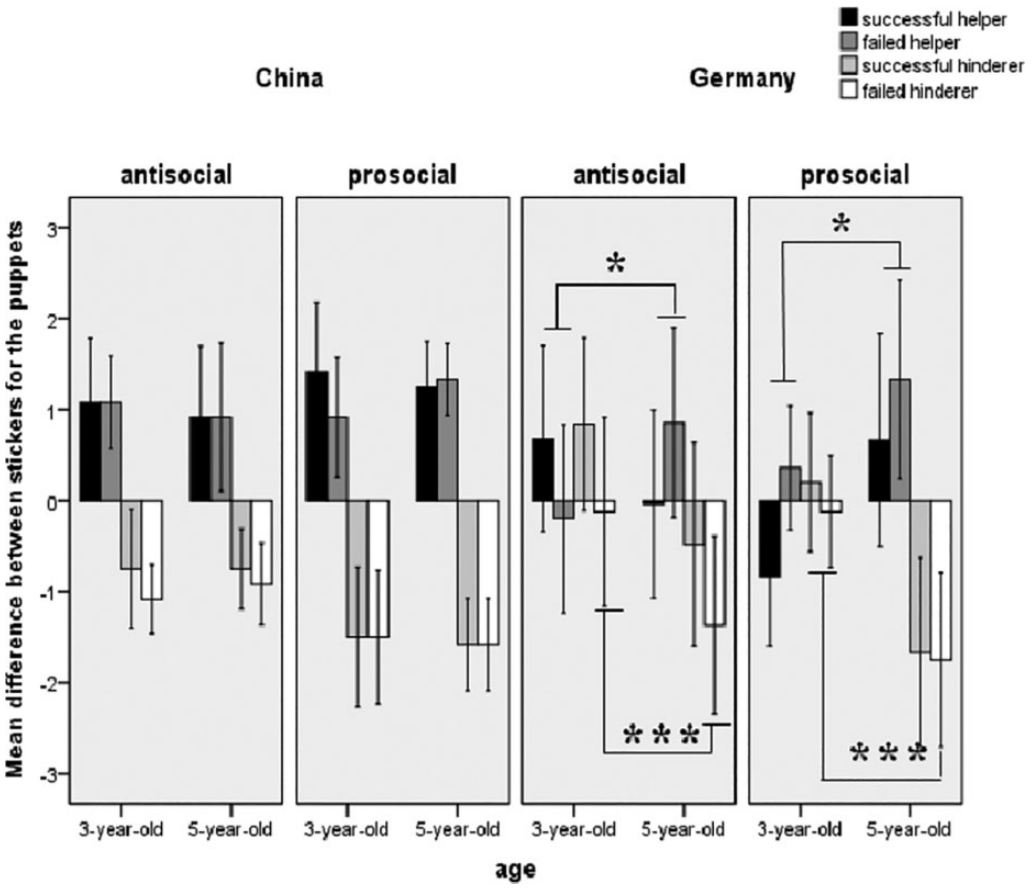

Figure 3. Chinese and German Children's Distribution of Stickers to the Actor Puppet and the Bystander Puppet.
Note. There were 96 Chinese children and 101 German children. The mean difference between stickers for the actor puppet and for the bystander puppet referred to the number of stickers for the actor puppet minus the number of stickers for the bystander puppet. The error bars refer to the standard errors. *$p < .05$. ***$p < .001$.

year-old Chinese children may distribute more resources to the actor puppet in the conditions of successful helper and failed helper, successful helper: $F(1, 97) = 9.23$, $p = .003$, $\eta^2_{\text{partial}} = .09$, CI [.02, .18]; failed helper: $F(1, 97) = 4.93$, $p = .028$, $\eta^2_{\text{partial}} = .05$, CI [.003, .13], and distributed less resources to the actor puppet in the conditions of successful hinderer and failed hinderer, successful hinderer: $F(1, 97) = 15.73$, $p < .001$, $\eta^2_{\text{partial}} = .14$, CI [.05, .24]; failed hinderer: $F(1, 97) = 9.50$, $p = .002$, $\eta^2_{\text{partial}} = .09$, CI [.02, .19], while 5-year-old Chinese children performed similarly with 5-year-old German children in the other three conditions except for the failed helper condition. Moreover, 5-year-old German children tended to distribute more resources to the actor puppet than 3-year-old German children in the condition of failed helper, $F(1, 100) = 6.14$, $p = .014$, $\eta^2_{\text{partial}} = .06$, CI [.01, .14], and to distribute less resources to the actor puppet in the conditions of successful hinderer and failed hinderer, successful hinderer: $F(1, 100) = 15.20$, $p < .001$, $\eta^2_{\text{partial}} = .13$, CI [.04, .23]; failed hinderer: $F(1, 100) = 14.76$, $p < .001$, $\eta^2_{\text{partial}} = .13$, CI [.04, .23], whereas there were no significant differences in distributing resources to the actor puppet between 3-year-old and 5-year-old Chinese children in all the four conditions. These results suggest that compared with 3-year-old German children, 3-year-old Chinese children were more likely to distribute more resources in the conditions with positive intention (helper conditions) and to distribute less resources in the conditions with negative intention (hinderer conditions), while 5-year-old German and Chinese children performed similarly when making moral behavior in the context of indirect reciprocity.

There was also a significant interaction between condition and context, $F(1, 196) = 2.77$, $p = .041$, $\eta^2_{\text{partial}} = .01$, CI [.00, .05], and post hoc simple effect analysis showed that in the condition of successful hinderer, children may tend to distribute less resources to the actor puppet in the prosocial context than in the antisocial context, $F(1, 196) = 8.48$, $p = .004$, $\eta^2_{\text{partial}} = .04$, CI [.01, .10], whereas in the other three conditions, there were no significant differences in distributing resources to the actor puppet between the two social contexts.

To further investigate whether children tend to prioritize intention over outcome when making moral behaviors (distributing resources), we combined the four conditions into positive (successful helper and failed helper) and negative (successful hinderer and failed hinderer) intention conditions. The main effect of intention was significant, $F(1, 196) = 65.16$, $p < .001$, $\eta^2_{\text{partial}} = .25$, CI [.17, .33]. The interaction between intention and nation was significant, $F(1, 196) = 12.44$, $p = .001$, $\eta^2_{\text{partial}} = .06$, CI [.02, .12], so was the interaction between intention and age, $F(1, 196) = 7.54$, $p = .007$, $\eta^2_{\text{partial}} = .04$, CI [.01, .09].

Again these results must be interpreted within the context of a significant interaction among intention, age, and nation, $F(1, 196)$

$= 7.83$, $p = .006$, $\eta^2_{partial} = .04$, CI [.01, .09]. Post hoc simple effect analysis showed that in the positive intention condition, 3-year-old Chinese children tended to distribute more resources to the actor puppet than 3-year-old German children, $F(1, 97) = 10.78$, $p = .001$, $\eta^2_{partial} = .10$, CI [.02, .20], whereas there was no significant difference between 5-year-old Chinese children and 5-year-old German children. Moreover, 5-year-old German children may be more likely to distribute more resources to the actor puppet than 3-year-old German children, $F(1, 100) = 4.34$, $p = .039$, $\eta^2_{partial} = .04$, CI [.001, .12], while there was no significant difference between 3-year-old and 5-year-old Chinese children. In the negative intention condition, 3-year-old German children tended to distribute more resources to the actor puppet than 3-year-old Chinese children, $F(1, 97) = 17.57$, $p < .001$, $\eta^2_{partial} = .15$, CI [.06, .26], whereas there was no significant difference between 5-year-old Chinese and German children. Moreover, 5-year-old German children tended to distribute less resources to the actor puppet than 3-year-old German children, $F(1, 100) = 20.98$, $p < .001$, $\eta^2_{partial} = .17$, CI [.07, .28], while there was no significant difference between 3-year-old and 5-year-old Chinese children. The results indicate that 3-year-old Chinese children's moral behaviors were guided more often by intentions compared with 3-year-old German children. However, by age 5, German children did engage in intent-based moral behavior in the context of indirect reciprocity.

Discussion

We investigated the cultural differences in the developmental origins of Chinese children and German children's intent-based moral judgment and moral behavior in the context of indirect reciprocity. Our results showed that Chinese children as young as 3 years old relied more on intention when making moral judgments and distributing resources. They tended to approve of the actor puppet's behavior more often and to allocate it more resources in the positive intention condition than in the negative intention condition. Three-year-old German children, however, relied more on outcome when making moral judgments and distributing resources. By the age of 5, both Chinese and German children were able to make intent-based moral evaluations and to allocate resources accordingly.

The results pertaining to Chinese children in the current study may seem anomalous with the results of previous studies that found that 3-year-old children relied more on outcome when making moral evaluations and allocating resources (Li & Tomasello, 2018; Van de Vondervoort & Hamlin, 2017).

A possible explanation is that cultural differences are responsible for the variation in results for 3-year-olds. Culture plays a vital role in children's cognitive development and shapes their perception, as well as their understanding of their physical and social worlds (Wang, 2018). In a relation-oriented society, it is of great importance to establish one's social network through reciprocity or indirect reciprocity. Indirect reciprocity in particular is used to grow social networks in Chinese culture which emphasizes ties to family members, friends, and acquaintances (Zhang & Hong, 2017). In addition, China is on the high end of the Hall's (1976) continuum for high- to low-context cultures (Fang & Faure, 2011). In a high-context culture, communicators tend to convey information in an implicit way, such that only limited meaning can be derived from a direct interpretation of language (Guan et al., 2009). To fully comprehend another's message, one must consider additional cues such as context and intention. German culture, on the other hand, is a relatively low-context culture, meaning that communicators usually convey information in a clear and explicit way (Gudykunst & Nishida, 1986). Compared with German children, Chinese children growing up in a relationship-based culture and high-context culture might be better at inferring the intentions of others and have a deeper understanding of indirect reciprocity.

Children's knowledge of their physical and social worlds comes not only from their increasing cognitive capacities but also from their expanding cultural experiences (Wang, 2018). Through daily interactions with people around them, such as parents, teachers, peers and friends, children get to know the world and themselves according to the social norms and conventions (Wang, 2018). Thus, it is possible that early exposure to and engagement in indirect reciprocity as well as repeated reference to intention provide opportunities for Chinese children to make intent-based moral judgments and to behave morally as a third party. Given that making situation-based moral judgments and allocating resources require children to integrate context, the puppet actor's intention, and the outcome simultaneously, we cannot rule out the possibility that some domain-general social cognitive abilities such as executive functioning might play an important role in Chinese children's outperformance in situation-based moral evaluations, as evidenced by a study that suggested Chinese children have a slight advantage in executive functioning than western children (Sabbagh et al., 2006). More direct work needs to be done, however, to test this possibility.

It is worth noting that there was a difference in the interaction between intention and context when children made moral judgments and distributed resources. Only in the condition of successful helper, children tended to approve of the actor puppet's behavior more often in the prosocial context than antisocial context. However, when it comes to allocating stickers, there was no significant difference between the stickers that children distributed to the actor puppet in the prosocial context and antisocial context when the actor puppet served as a successful helper. These results indicated that there is a gap between children's knowledge and their behavior, as some studies revealed that children struggle to allocate resources in accordance with what they think they should do (Blake et al., 2014; Smith et al., 2013). This is probably due to the effects of individual self-regulation, social distance (the degree of closeness of the relationship between children and the target of moral judgments and moral behavior), social learning, theory of mind, and moral knowledge on children's giving behavior (Blake, 2018).

Limitations and Future Directions

There are some limitations in our study. First, we did not examine children's theory of mind and executive function, which might play an important role in explaining these results. However, some studies found "East-West" contrasts that Chinese children outperformed their western counterpart on executive function but not on theory of mind (Wang et al., 2016), making it tricky to clarify the influence of theory of mind and executive function on children's moral judgment and moral behavior. Future studies would benefit from further investigating the underlying mechanisms of how theory of mind and executive function influence moral judgment and moral behavior. Second, in our study, we failed to directly measure children's relationship orientation and manipulate the level of implicitness. Future studies can examine whether relationship orientation indeed mediates cultural differences observed in this

study by directly measuring children's relationship orientation and varying the level of implicitness.

Conclusion

To conclude, our most important finding is that, Chinese children were able to make moral judgments and distribute resources based on intention in the context of indirect reciprocity at a surprisingly early age, whereas German children tended to prioritize intention when making moral judgments and allocating resources at the age of 5. It indicates that culture may mediate children's intent-based moral judgment and moral behavior in the context of indirect reciprocity.

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Jing Li and Wenwen Hou contributed equally to this work.

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Supplemental Material

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