

## The Relationship between Theory of Mind and Moral Development in Preschool Children<sup>1</sup>

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**Abstract:** The aim of the present study was to investigate the relationship between theory of mind and moral judgment (based on intention and based on motive) in a sample of Brazilian preschool children. Twenty-four 4- and 5-year olds were assessed in theory of mind and moral reasoning tasks. Although the correlation between performances in the two types of task was not significant, some important effects were found: participants were better at judging intentional behaviors than accidental ones and 5-year-olds performed better than 4-year-olds in the moral reasoning task based on motive. These results suggest that more sophisticated moral reasoning is associated with the capacity to differentiate intentional and non-intentional actions as well as to identify the underlying motives of human action.

**Keywords:** theory of mind, moral development, preschool students

## A Relação entre Teoria da Mente e Desenvolvimento Moral em Crianças Pré-Escolares

**Resumo:** O objetivo deste estudo foi investigar a relação entre teoria da mente e julgamento moral (com base na intenção e com base no motivo) em uma amostra de crianças brasileiras de idade pré-escolar. Vinte e quatro crianças de 4 e 5 anos foram avaliadas por tarefas de teoria da mente e de julgamento moral. Embora a correlação entre os desempenhos nos dois tipos de tarefa não tenha se mostrado significativa, alguns efeitos importantes foram encontrados: os participantes tiveram mais facilidade para julgar os comportamentos propositais do que os acidentais; e as crianças de 5 anos tiveram um desempenho melhor do que as de 4 anos na tarefa de julgamento moral com base no motivo. Esses resultados sugerem que um julgamento moral mais sofisticado está associado a uma capacidade de diferenciar ações intencionais e não intencionais, bem como de identificar os motivos subjacentes à ação humana.

**Palavras-chave:** teoria da mente, desenvolvimento moral, pré-escolares

## La Relación entre la Teoría de la Mente y el Desarrollo Moral en Niños Pre-Escolares

**Resumen:** La finalidad en el presente estudio fue investigar la relación entre la teoría de la mente y el raciocinio moral (basado en la intención y en el motivo) en una muestra de niños brasileños en edad pre-escolar. Veinticuatro niños de 4 y 5 años fueron evaluados en tareas de la teoría de la mente y de raciocinio moral. Aun que la correlación entre los resultados de los dos tipos de tarea no fue significativa, algunos efectos importantes fueron encontrados: los participantes eran mejores en juzgar las conductas intencionales que las accidentales; y los niños de 5 años alcanzaron mejor desempeño que aquellos de 4 años en la tarea de raciocinio moral basado en el motivo. Estos resultados sugieren que un raciocinio moral más sofisticado se asocia a la capacidad de distinguir entre acciones intencionales y no intencionales, así como de identificar los motivos subyacentes de la acción humana.

**Palabras clave:** teoría de la mente, desarrollo moral, pre escolares

Theory of mind is conventionally defined as the ability to attribute mental states (e.g., beliefs, desires, intentions or emotions) to oneself or to other people (Wimmer & Perner, 1983). According to Astington (2003), mental state understanding is a fundamental cognitive achievement for children as it allows them to notice two important facts: that the world is represented by the mind and that the way in

which a person represents the world around them determines what this person says or does.

The number of studies investigating possible relations between theory of mind and other developmental processes is still limited (Hughes, 2011). A promising line of investigation, for example, is the relation between theory of mind and moral judgment (Baird & Astington, 2004; Chee & Murachver, 2012; Killen, Mulvey, Richardson, Jampol, & Woodward, 2011; Knobe, 2005; Smetana, Jambon, Conry-Murray, & Sturge-Apple, 2012). Although the theory of mind and moral development study fields have parallel trajectories, both, in fact, have the same study objective: to understand how children reason about beliefs and intentions, mainly when the interpretation and assessment of human

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behavior are at stake. The difference is that the field of moral development is more directed towards the distinction between what is considered to be right and wrong, whereas the field of theory of mind is more concerned with the ability to distinguish between true and false (Astington, 2004).

In fact, it is not difficult to imagine how theory of mind and morality can influence each other. For example, when one reasons about whether a person has done right or wrong, it is important to be able to assess the intention or motive that led this person to act in such a way. In the same manner, possible punishment cannot be predicted if one does not assess the intentionality of such agents. When we know a person's desires and beliefs, it is possible to infer the intentions and motives behind his/her behavior.

More than simple conjectures, there is empirical evidence that children's theory of mind development is positively correlated with their moral development. For example, in an innovative study, Dunn, Cutting and Demetriou (2000) assessed 128 4-year-old children (64 pairs of friends) in a battery of theory of mind tasks, a test of emotion comprehension and language tests. The main goal of the study, however, was the assessment of the participants' level of permissibility of different transgressions among friends. More specifically, children were asked about three types of transgression: name-calling, taking a toy from a friend and excluding a friend from a game. The roles of victim and transgressor were counterbalanced. Next, children were interviewed about how permissible the transgressions were. For example, in a story during which the target child was the victim, the researcher asked the following questions: "If your friend will not let you play with him, is that okay or not okay?"; "Why is that okay/not okay?". Children's theory of mind skills were positively correlated with two measures of morality (assessment of permissibility and moral justification). More specifically, children with higher scores in theory of mind were also more likely to justify transgressions among friends using the argument of one's need to take into consideration the other person's feelings or point of view.

Conversely, Baird and Astington's results (2004) suggest that 5- and 7-year-old children are capable of detecting the motive that leads someone to act and, based on this piece of information, they can say whether an action is moral or not. In this study, participants heard six stories which always involved two characters performing the same action, but with two very different motives. For example, in one story, two girls decided to turn on the hose: whereas one wanted to take care of her mother's garden, the other wanted to destroy the sand castle her brother had built. Next, participants were asked to evaluate each character's action using a five-point scale which varied from a "very good" action to a "very bad" action. In addition, the children were always asked about possible punishment: "Do you think X (character) can get in trouble?"

Data analysis revealed a positive correlation between the participants' performance in the moral reasoning task

and in the false belief tasks. Furthermore, these researchers found that a group of 7-year-old children with aggressive behavior had lower scores in the moral reasoning tasks and in the second-order false-belief tasks, when compared to a group of children of the same age but with no history of aggressive behavior. Therefore, these data suggest that children with a more advanced theory of mind are capable of taking into consideration a person's motives or intentions when judging an action as morally good or bad.

The entrance into the world of rules and the understanding of why they are necessary (e.g., when a child is taught not to hit a friend because he can become sad) are also important steps in the process of moral development and can also aid in the acquisition of a theory of mind. For example, some studies suggest that moral reasoning interferes with the assessment of intentionality under some specific circumstances, which is true both for children and adults (Knobe, 2003; Leslie, Knobe, & Cohen, 2006; Pellizzoni, Siegal, & Surian, 2009).

More specifically, Knobe (2003) demonstrated that, when judging a situation during which an action may lead to foreseen side effects, albeit neglected, adults claim that the side effects were produced on purpose when the effects were morally bad, but not when they were morally good. For example, participants were asked to evaluate the following situation: the CEO of a company started a new policy which will give him more profit; however, it will also damage the environment. He knows that, but does not care about the side effects (i.e., environmental damage). Given this context, participants claimed that he intentionally caused damage to the environment. But if, on the contrary, this same CEO starts a new profitable policy that also helps the environment (foreseen consequence, but in which he has no interest), adults claim that his help was not intentional. Consequently, there seems to be a bias in moral judgments when the indirect consequences of behavior are negative, but not when they are positive. Knobe called this phenomenon the "side-effect effect". A similar study, conducted by Pellizzoni et al. (2009) with 4- and 5-year-old children, showed that children present the side-effect effect even when the agent did not know what the effects of his action would be. For the stories during which the agent had previous knowledge, but did not care about the consequences, children's judgment depended on the outcome: they judged the actions with a negative outcome as purposeful, but those with a positive outcome as being accidental.

Based on this evidence, one can argue that these two domains - social cognition and morality - are intrinsically related. However, more studies investigating the exact nature and direction of this relation need to be conducted. Moreover, close attention should be paid to the chronology of moral development and theory of mind. When children make significant progress in one domain (e.g., understanding of false belief), do they also show progress in the other (e.g., moral reasoning)?

The literature review conducted by Turiel (2006) suggests that sophisticated moral reasoning only emerges

during middle childhood and that younger children have heteronomous moral reasoning, controlled by another person's rules, generally an authority figure. For a long time, however, preschoolers' moral judgment was considered to be well below the complexity level that they are currently credited with.

Kohlberg (1954/1992), for example, suggested that preschoolers present moral judgment that is strictly contingent to obedience to rules. Kohlberg's argument, however, is based on studies using stories with moral dilemmas which were too complex to be fully understood and evaluated by children (Turiel, 2006). Smetana's findings (2006), contradicting such conclusions, show that at around 2 ½ years of age, children are already capable of judging moral transgressions (e.g., hitting a school mate) with more severity than transgressions of social norms (e.g., not putting an object where an adult said it should be), suggesting that the existence of the rule is not the only factor to be considered in their judgments. In the same manner, Turiel highlights a series of other studies showing that some moral judgments made by preschool children are not based on rules or sanctions.

Piaget (1932/1994), in turn, suggested that preschool aged children, when confronted with situations that demand moral judgment, judge behaviors that caused the greatest amount of damage more severely and do not take into consideration the intention underlying the behavior. His method consisted of telling children two stories and asking them to decide which character did wrong. For example, a boy who broke fifteen cups when walking into the dining room, without knowing that there was a chair behind the door, or another boy who broke only one cup accidentally when trying to reach a pot of jam when his mother was not home. This finding led Piaget to argue that children are not yet capable of judgments based on intentionality at this age.

This conclusion, however, has been questioned by other researchers given that Piaget (1932/1994) varied consequence and intentionality concomitantly (Baird & Astington, 2004). Furthermore, the damage caused in both situations was accidental and not intentional (Karniol, 1978). Although one can argue that the boy who broke one cup by trying to get the jam sneakily would be guiltier than the one who simply walked into a room and broke all the cups on the tray, the example is still controversial, given that, in both cases, the consequence (broken cups) was unintended (Karniol, 1978). When other researchers used intended consequences and kept the damage constant or even emphasized the characters' intentions, they found that 4-year-olds are already capable of making moral judgments based on intention (Nelson-Le Gall, 1985).

All these findings seem to indicate once more that the relation between moral development and theory of mind is very solid, however, all the studies reported in this paper were conducted with U.S. or European children. In Brazil, Ângela Biaggio's work between 1970 and 2000 (Camino, 2003) and,

more recently, that of Yves de La Taille (La Taille, 2007) on moral development provided invaluable contributions for the advancement of this line of research in the country. Nonetheless, there are only a few researchers interested in investigating the relation between moral development and social cognition. The sociomoral development research group coordinated by Cleonice Camino, however, may be an exception.

Camino, Camino and Moraes (2003), for example, in an innovative study, investigated the relation between maternal practices of social control and children's moral judgment in 5- to 10-year-old children. This study also included the validation of an instrument to evaluate maternal practices of social control. More recently, Andrade, Camino, and Dias (2008) asked children and adolescents from 5 to 14 years of age to provide definitions for four different values: obedience, cooperation, responsibility and creativity. Whereas the adolescents showed greater concern for respect to other's perspectives and for the importance of social relationships, the younger children referred more to personal experiences. The results of this study seem to converge with the international literature which suggests that the development of moral reasoning is related to gains in social understanding.

Considering the limited number of national studies investigating the topic, the present work aimed to explore the relation between theory of mind and moral judgment (based on intention and based on motive) in a sample of Brazilian preschool aged children.

## Method

### Participants

Twenty-four children (11 boys and 13 girls), from an elementary public school located in a city of the state of São Paulo, participated in the study. Considering that previous studies investigating the relation between theory of mind and moral development were conducted with children between the ages of 4 and 6 years (Baird & Astington, 2004), participants were divided in two age groups: a group of 12 children between 4 and 5 years of age ( $M = 4$  years and 9 months,  $DP = 1.92$  months) and another group of 12 children between the ages 5 and 6 ( $M = 5$  years and 11 months,  $DP = 5.84$  months).

### Instruments

The following instruments were used: (1) four theory of mind tasks that assessed four components: diverse desires, diverse beliefs, contents false belief and explicit false belief; (2) a moral judgment task based on motive; and (3) a moral judgment task based on intention.

The theory of mind tasks used in this study are part of the scale designed by Wellman & Liu (2004) and were translated into Brazilian Portuguese by Domingues, Valério, Panciera and Maluf (2007). At first, we intended to use the

full scale, but a revision of the project's goals and the seven tasks led us to eliminate three of them: the knowledge access task, given that the understanding required in this task was already being measured in the contents false belief task and two tasks that assessed emotion understanding but which were too difficult for our participants (only 6-year-old children or older present success). In all the tasks used in the study, children heard a short story and the researcher would ask questions related to the desires, beliefs and state of knowledge of the characters.

We present below a description of the tasks:

*Diverse desires task:* the researcher presented to the child a puppet and two pictures: one with a drawing of a carrot and another with the drawing of a cookie. Next, she asked the child to name the food items in the pictures and to choose the snack he/she would like to eat most, the carrot or the cookie (question about child's own desire). The researcher then asked the puppet which was its favorite snack, and the answer was always the food item the child did not choose. The target question was: "It is lunch time and the puppet is only allowed to eat a little snack. Which snack will he choose: the carrot or the cookie?"

*Diverse beliefs task:* the goal was to evaluate whether the child understood that another person could think something different from what he/she thought and act according to that diverse belief. The researcher presented the child with a puppet and two pictures, one with the drawing of a garage and another with the drawing of a tree, and then told a story about a kitten who was missing and who could be hidden in one of these two places. Next, she would ask the child where she thought the kitten was hiding (question about child's own belief). Then, the researcher would say that the puppet thought that the kitten was hidden in the opposite place to the one suggested by the child and the target question was made: "Where will the puppet look for the kitten?"

*Contents false belief task:* the researcher showed the child a closed box of cereal and asked what was inside the box. Next, she would open the box and show the child that the box did not have cereal, but rocks. The box was then closed again and a puppet called Zé was introduced. The researcher said that Zé had not looked inside the box and asked two questions: "What does Zé think is inside the box?" (Target question) and "Has he ever looked inside the box?" (Memory question).

*Explicit false belief task:* in this task, the child needed to understand that a person acts according to his/her belief, even when the child knows that this person's belief is false. The researcher presented the participant with a puppet and two drawings, one of a backpack and another of an umbrella. Next, the child was told that the puppet had lost his gloves and that they were in the closet, but the puppet did not know that and thought they were in its back-pack. The target question was: "Where will the puppet look for his gloves? In the back-pack or in the closet?"

*Moral judgment based on motive:* in order to assess the participants' ability to make moral judgments of actions

based on motive, an adapted version of the task created by Baird and Astington (2004) was used. Ten stories were told with the help of two stuffed animals which were always engaged in the same neutral behavior (for example, turning on the radio). Nonetheless, one did it for a good reason (e.g., turning on the radio to liven up his brother's birthday party) and the other did it for a bad reason (e.g., turning on the radio to distract his brother from studying).

For each story, control questions were made to ensure that the child recognized that the character's actions were identical and also to remind the child of the specific desire of each character. Next, the researcher asked whether the story's characters were doing something right, something wrong or something that was neither right nor wrong.

*Moral judgment based on intention:* the participants' ability to make moral judgments of behavior based on intention was assessed by a procedure adapted from Nelson-Le Gall (1985). With the help of pictures, four stories were told: two with a negative outcome and two with a positive outcome. The outcomes of the negative stories and those of the positive stories were identical, except for the presence or absence of intention from the character to provoke that outcome. The stories were told in a random order by the researcher. After checking the child's understanding of the story, three questions were asked: (a) whether the character had the intention to perform the action that led to that outcome; (b) whether he/she expected the outcome of the story to happen; and, (c) whether he/she wanted that outcome to happen. Questions a, b, and c composed the judgment of intentionality.

## Procedure

**Data collection.** Each child participated in an individual session with the researcher, during which the six tasks (four theory of mind tasks and two to assess moral judgment) were administered. The researcher explained to each participant that she would tell some stories and ask some questions. Sessions were conducted in a room previously assigned by the school principal. The order of task presentation was always the same: diverse desires, diverse beliefs, contents false belief, explicit false belief, moral judgment based on motive, moral judgment based on intention.

**Data analysis.** With regards to the theory of mind tasks, each story had only one target question that was scored dichotomically: 0 if the answer was incorrect and 1 if the answer was correct. The total score was obtained by the sum of scores for the stories, varying therefore, from 0 to 4 points. In the diverse desires task, the child's answer was scored as correct (1 point) if the child said that the puppet would choose the snack that was different from the one he/she chose. In the second task (diverse beliefs), in order to score, the child had to say that the puppet would look for the kitten in the place opposite to his/her own choice. In the third task (contents false belief), the child's answer had to be consistent with the apparent content of the box (cereal) and he/she had to say "no" to the memory question, when

this was the case, the child scored (1 point). In the final task (explicit false belief), for the answer to be considered correct (1 point), the child had to answer “back-pack” to the target question and “closet” to the reality question.

For the moral judgment based on motive task, three scores were possible: score for the right motive, score for the wrong motive and total score. The right motive score and the wrong motive score varied from 0 to 10 points and were calculated by verifying whether the participant judged the action carried out for a good reason as right and the action carried out for a bad reason as wrong. The total score was obtained by summing the score for the right motive and that for the wrong motive, and varied from 0 to 20 points.

With regards to the moral judgment based on intention task, the answers were coded; 0 was attributed to each wrong answer and 1 to each right answer. Consequently, each story had a score of 0 to 3 for intentionality, totaling a maximum of 12 points.

During the second part of the task, the researcher asked the participant to judge the character’s behavior, more specifically, to judge whether his/her behavior was right, wrong or neither right nor wrong. If the child said the behavior was either right or wrong, the researcher would then show a scale of seven facial expressions which represented different levels of appropriateness of behavior, as evaluated by the participant; (1) very wrong; (2) wrong; (3) slightly wrong; (4) neither right nor wrong; (5) slightly right; (6) right; and, (7) very right. The facial expressions with a frown (actions judged as wrong), as well as the smiley facial expressions (actions judged as right) were identical, except for their size, which was designed to help participants understand the change in intensity.

### Ethical Considerations

The study was approved by the Human Research Ethics Committee of the Universidade Federal de São Carlos (nº069/2009) and only children whose parents signed the terms of consent participated in the study.

## Results

### Theory of Mind

A repeated measures ANOVA revealed a significant effect of task on participants’ performance,  $F_{(3,66)} = 4.29$ ,  $p = 0.008$ . Pairwise comparisons revealed a significant difference between the contents false belief task ( $M = 0.37$ ) and both the diverse desires task ( $M = 0.79$ ) and the explicit false belief task ( $M = 0.75$ ), ( $ps = 0.01$  and  $0.04$ , respectively). No significant effects of age or gender were found.

### Moral Judgment Based on Motive

A K-S test was conducted to verify whether the distribution of scores was normal in the moral judgment task based on motive. The distribution was normal for the

4-year-old group ( $D_{(12)} = 0.17$ ,  $p = n.s.$ ), but not for the 5-year-old group ( $D_{(12)} = 0.28$ ,  $p < 0.05$ ), which suggested that it was not possible to run parametric tests with the sample of older children.

Therefore, in order to verify the existence of possible age effects for the moral judgment based on motive scores, the Mann-Whitney test was conducted and a significant effect of age was found only for the score for the wrong motive ( $U = 44.00$ ,  $p = 0.05$ ,  $r = -0.39$ ), with the 5-year-old children performing better than the 4-year-olds. A Mann-Whitney test was also conducted to verify possible effects of gender, but no significant effect was found.

Additionally, a D prime ( $d'$ ) analysis was conducted in order to examine whether participants were capable of correctly detecting the right motive and the wrong motive when they appeared or whether their answers were product of chance. The intention was also to verify a possible bias in the participants’ answers when they make mistakes, that is, to test whether it was more likely that they would judge the motive as right in the wrong motive stories or whether it was more likely that they would judge the motive as wrong in the right motive stories. Hit rates, false alarms (FA) and  $d'$  values were calculated for each age group, for both types of motive (right and wrong). The results are presented in Table 1.

Table 1  
*Hit Rates, False Alarm Rates (FA) and  $d'$  Values for Each Type of Motive according to Age*

Motive		Hit	FA	$d'$
Right	4 years	0.925	0.200	2.24
	5 years	0.908	0.025	3.36
Wrong	4 years	0.800	0.075	2.28
	5 years	0.975	0.092	3.29

Four-year-old children have higher false alarm rates for the right motive than 5-year-old children ( $FA = 0.2$  e  $FA = 0.025$ , respectively), that is, they are more likely to claim that the motive is right when in fact it should be considered wrong. Furthermore, the  $d'$  values suggest that 5-year-old children are better than the 4-year-olds at correctly detecting the motive for both right motive stories ( $d' = 3.36$  and  $d' = 2.24$ ) and wrong motive stories ( $d' = 3.29$  and  $d' = 2.28$ ).

### Moral Judgment Based on Intention

The participants’ total score in the moral judgment based on intention tasks was composed of 4 scores: the score for the accidental positive story, the score for the intentional positive story, the score for the accidental negative story and the score for the intentional negative story. The participants’ mean scores for each type of story can be seen in Figure 1.

A repeated measures ANOVA did not reveal significant effects of age ( $p = 0.966$ ) or gender ( $p = 0.793$ ), nor did it reveal a significant effect of outcome (positive or negative),  $F_{(1,16)} = 0.43$ ,  $p > 0.05$ . However, a significant effect of

intention (accidental or intentional) was found,  $F_{(1,16)} = 6.45$ ,  $p = 0.022$ . Pairwise comparisons revealed that the children performed better in the intentional stories ( $M = 2.05$ ) than in the accidental stories ( $M = 1.40$ ).

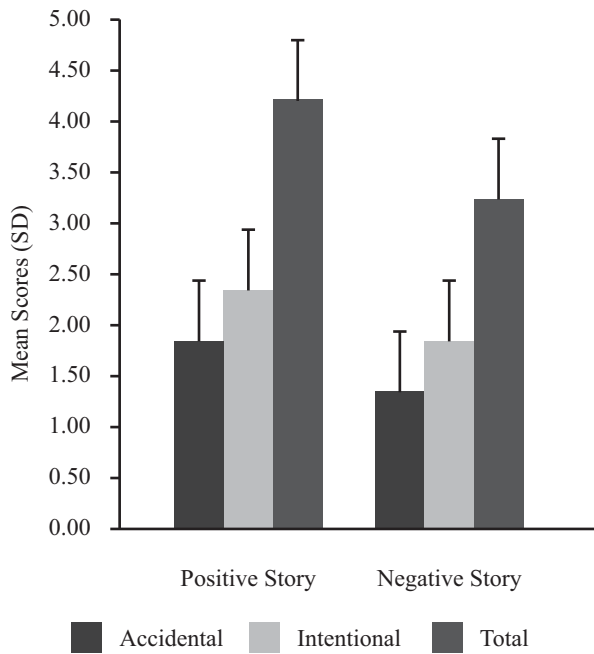


Figure 1. Mean scores for positive stories, negative stories and total scores.

**Theory of Mind and Moral Judgment Based on Motive**

Spearman correlations were not significant for both age groups. Additionally, correlations between motive scores and theory of mind tasks were conducted for each age group. Again, no correlation was found. Results are presented in Table 2.

Table 2  
Correlations (*r*) between Theory of Mind Tasks and Moral Judgment Based on Motive Scores for Each Age Group

		Right Motive	Wrong Motive	Total Motive
Diverse Desires	4 years	0.067	-0.119	0.058
	5 years	0.341	0.448	0.340
Diverse Beliefs	4 years	-0.061	-0.274	-0.133
	5 years	-0.034	-0.315	-0.067
Contents FB	4 years	-0.029	0.387	0.402
	5 years	-0.073	0.257	-0.037
Explicit FB	4 years	0.067	-0.119	0.058
	5 years	-0.330	-0.257	-0.329

Note. FB = false belief. *ps* = n.s

**Theory of Mind and Moral Judgment Based on Intention**

Given that a difference in participants’ performance between the accidental and the intentional stories was found, independent of the positive or negative aspect of the story,

Spearman correlation tests were conducted to test relations between theory of mind and total scores for the intentional and accidental stories, as well as relations between theory of mind and the moral judgment based on intention total score. The tests did not reveal, however, significant correlations between these variables (Table 3).

Table 3  
Correlations (*r*) between Theory of Mind Scores and Moral Judgment Based on Intention Scores

	Accidental	Intentional	Total Score
Diverse Desires	0.147	0.216	0.385
Diverse Beliefs	0.074	0.061	0.144
Contents FB	-0.019	0.259	0.251
Explicit FB	0.063	-0.216	-0.158
Total Score on ToM	0.116	0.150	0.281

Note. FB = false belief; ToM = theory of mind. *ps* = n.s

**Discussion**

Firstly, the analysis of the results regarding moral judgment based on motive revealed an age effect for the identification of wrong motives. More specifically, children from both age groups were equally efficient in detecting actions with good motives and in judging them as correct. However, the 5-year-olds were more competent than the 4-year-olds in detecting and judging actions with bad or wrong motives. The *d* prime analysis (*d*’) also revealed an interesting difference between the two groups: when the younger children made mistakes, they were more likely to judge as correct an action with a bad motive than to judge as wrong an action with a good motive. These results seem to corroborate Baird and Astington’s findings (2004) given that in their study, 5- and 7-year-old children had a significantly better performance than 4-year-olds in the task. More specifically, 5- and 7-year-old children appeared to be more competent than 4-year-olds in detecting the two types of motive. As heteronomous moral reasoning seems to emerge at the end of the preschool years (Turiel, 2006), it is possible that 5-year-old participants have superior moral reasoning than their 4-year-old peers and, therefore, present a more developed ability to identify transgressions to rules. Nonetheless, it is important to investigate why the 4-year-old children in the present study have a specific difficulty in correctly judging actions with wrong or bad motives.

A possible explanation is related to the fact that the behaviors with wrong motives used in this moral judgment task were invariably moral transgressions or transgressions of conduct norms (like kicking a ball on the wall to make it dirty, running to escape from the teacher, asking permission to drink water in order to get out of the classroom), whereas the behaviors with correct motives were only routine actions, without any clear association to moral values (like kicking a ball when playing with friends, running in a hide-and-seek game or asking permission to drink water due to being

thirsty). Four-year-old children's difficulty in the task could be, therefore, directly related to a limitation in reasoning about moral transgressions. An interesting future direction for research on moral judgment based on motive would be to use a modified version of the task that includes actions with good motives that are considered desirable or morally honorable (e.g., kicking the ball so an elderly grandmother does not trip or running to tell a friend that the physical education class will be in the soccer field) in contrast to the actions with wrong or bad motives used in the present study.

With regards to the participants' performance in the moral judgment based on intention task, no differences were found between the two age groups. One important finding, however, was the significant effect of intentionality on the participants' judgments. The analysis of the results revealed that the children found it easier to identify when a consequence occurred intentionally than when a consequence occurred accidentally, independent of the story outcome being positive or negative.

This finding seems to be corroborated by Imamoglu's data (1975) with 5- to 11-year old children. This study investigated the influence of different factors on moral judgments, including intentionality. The author demonstrated that the mean response time for the children's evaluations of accidental actions was significantly higher than the mean response time for the evaluation of intentional actions. These results suggest that the children hesitated when deciding which judgment was the correct one for this type of action, or may reflect a difficulty children face in evaluating accidental actions.

Surprisingly, however, correlations between theory of mind and scores in the moral development tasks were not significant, although there are studies which found such a relationship (Baird & Astington, 2004; Chee & Murachver, 2012; Killen et al., 2011; Knobe, 2005; Smetana et al., 2012). A plausible explanation for this finding is the fact that, our study, thoroughly based on Baird and Astington's work (2004), was not a reliable replication of the aforementioned research. Although we tried to contact the authors, requesting the original instrument used for the assessment of moral development based on motive, we received no reply which, in turn, led to the need to elaborate items for the instrument, having only a few examples made available by the authors of the published work as a model. This condition may have contributed to the lack of agreement between our findings and theirs.

No associations between theory of mind scores and moral judgment based on intention were found. This can be explained by an important aspect raised by Killen et al. (2011): traditionally, studies that search for relations between theory of mind and moral development use false belief tasks that do not require the child to consider the social relationships and social information present in a given situation, in contrast to intentionality judgments made in his/her daily interactions.

From the authors' point of view, therefore, assessing each ability separately (one or more tests to assess theory of mind and one or more tests to assess moral development) is a risky strategy, particularly when the intent is to test correlations. In a recent study, Killen et al. designed a false belief task they believe is "morally relevant" (morally-relevant theory of mind task – MoTom). Children who passed the MoTom task were more competent in judging whether a character should be punished or not based on his intentions (rather than prioritizing the damage caused) than when passing a traditional false belief task and should make the same decisions in a different moral development test. Such result may indicate the existence of a stage during which both abilities start to relate efficiently and moral reasoning undergoes a qualitative leap, with theory of mind becoming an important component of its functioning.

We conclude, therefore, that children can be making moral judgments even before they fully understand how beliefs, desires and intentions are capable of influencing the thoughts and behaviors of other children and vice-versa, that is, without yet reasoning in terms of mental states (Peterson & Siegal, 2002). Consequently, it is possible that preschool children's own moral development stage, which stands out for its adherence to rules established by an authority figure more than by their own reasoning per se (Turiel, 2005), is too incipient for them to make use of mental state inference and this qualitative leap, found in other studies, may not have yet occurred in the small sample of children who participated in the present study.

## Conclusions

The present study is innovative as it is the first to explore the relation between moral development and theory of mind in Brazilian children. Although our results do not suggest an association between participants' performance in theory of mind tasks and both types of moral judgment (based on motive and based on intention), it is important to note that participants were more competent to judge intentional actions than accidental ones. This effect suggests that a more sophisticated moral judgment depends on cognitive advancements in the theory of mind domain (i.e., distinguishing intentional and non intentional actions). Furthermore, the data presented here suggest an interesting developmental pattern with regards to the distinction between actions with right motives and actions with wrong motives. Future studies need to investigate why 5-year-old children are better at judging the behaviors motivated by bad reasons than 4-year-olds. We suggest that future studies should include a larger sample of participants, as well as a group of older children (or even adults) in order to obtain a better understanding of how social cognition and moral reasoning relate in the different stages of development.

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