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Toddlers' preference for prosocial versus antisocial agents: No associations with empathy or attachment security

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Abstract

Research has indicated that the majority of infants and toddlers prefer prosocial to antisocial agents, but little research has examined interindividual differences in children's preference. This study examined whether 24-month-olds' ($n = 107$) sociomoral preference was associated with attachment security or empathy, assessed with the Attachment Q-Sort and the Empathy Questionnaire. Toddlers were presented with a puppet play, in which a protagonist tried to open a box and was helped by a prosocial agent and hindered by an antisocial agent. Then, toddlers were asked to pick up either the prosocial or the antisocial agent (manual choice), as a measure of their sociomoral preference. Of the 107 toddlers included in this study, 60.7% chose the prosocial over the antisocial agent. Neither empathy nor parent-child attachment was associated with children's preference. Our findings indicate a slight overall preference for the prosocial agent, but with notable interindividual differences not explained by empathy or attachment.

KEYWORDS

attachment, empathy, moral cognition, moral development, parenting, social cognition, social evaluation

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1 | INTRODUCTION

Evaluating other people's actions and motives is essential for successfully navigating our social world and for choosing appropriate helping, prosocial partners while avoiding antisocial ones. But when do these abilities to evaluate others emerge? And how are individual differences associated with sociomoral abilities?

Hamlin et al. (2007) found evidence that an overall preference for a prosocial, helping character over a hindering, antisocial character is already present in 6- and 10-month-old infants. The researchers uncovered this by presenting infants with a scenario, in which a character, a wooden circle with large googly eyes, repeatedly and unsuccessfully tries to climb a hill (Hamlin et al., 2007). This character is then either pushed up the hill by a prosocial "helper" or is pushed down the hill by an antisocial "hinderer". When infants were presented with both the helper and the hinderer afterwards, more infants (87.5% of the 10 month olds, 100% of the 6 month olds) reached for the helper than for the hinderer. Hamlin et al. (2007) interpreted this as an indication that infants evaluate individuals based on their social interactions from a very early age on and may thus possess a universal, unlearned "innate moral core".

1.1 | Further evidence for infant's sociomoral preference

Hamlin et al.'s (2007) seminal work was followed by more than 25 studies (Margoni & Surian, 2018) on infants' early sociomoral evaluations. Multiple successful replications of Hamlin et al.'s (2007) original design provided further evidence for an overall preference for prosocial over antisocial agents in infants (Hamlin, 2015; Hamlin et al., 2010). Further studies expanded the social scenarios in which infants witnessed prosocial and antisocial agents, to examine whether infants' preference for prosocial agents can be found across a range of social scenarios (Hamlin & Wynn, 2011). Indeed, a meta-analysis by Margoni and Surian (2018) concluded that infants show a preference for a prosocial over an antisocial character across different social scenarios, with 64% (CI [60% to 69%]; adjusted effect size to account for publication bias) choosing the prosocial character across studies, thus indicating that infants' preference for prosocial others is not limited to specific scenarios. On top of the original *hill paradigm*, as used by Hamlin et al. (2007) in their first study (see description above), these different social scenarios, in which infants' prosocial preference was found, included three additional paradigms, all of which focus on showing infants helping, sharing, and cooperating scenarios (Holvoet et al., 2016): (1) a *ball paradigm*, in which a protagonist plays with a ball, which then rolls away or which is deliberately thrown towards the helper or hinderer, and which is either given or thrown back by a giver or taken away by a hinderer (e.g., Holvoet et al., 2018; Shimizu et al., 2018); (2) a *box paradigm*, in which a protagonist tries to open a box with a toy inside and is either helped by a helper or hindered by a hinderer (e.g., Hamlin, 2014; Steckler et al., 2017); (3) an *allocating goods paradigm*, in which a fair and an unfair distributor distribute goods such as crackers to two characters (e.g., Burns & Sommerville, 2014).

Further research, following Hamlin et al.'s (2007) first study, has also expanded the age of its study participants. While the majority of studies focused on infants between the ages of 6 to 18 months (Margoni & Surian, 2018), some studies looked at toddlers up to 30 months of age (e.g., Buon et al., 2014; Dahl et al., 2013; Scola et al., 2015) and two studies examined pre-schoolers (Hinten et al., 2018; Van de Vondervoort & Hamlin, 2017). Even infants as young as 3 months have been examined, although since these infants are too young to measure their preferences via preferential reaching, looking time measures are typically employed (Hamlin & Wynn, 2011; Hamlin et al., 2010).

1.2 | Contradicting evidence and criticism regarding infants' sociomoral preferences

While at least 16 studies reported evidence for infant sociomoral evaluations via an overall preference for prosocial agents in infants (Margoni & Surian, 2018), some conflicting evidence has been found as well. Neither Cowell and Decety (2015) nor Schlingloff et al. (2020) found a preference for the helper over the hinderer in infants who had seen the hill paradigm, with half of the sample reaching for the prosocial character, while the other half reached for the antisocial character in both studies. Geraci and Surian (2011), using the allocating goods paradigm, reported mixed evidence, with a prosocial preference in 16 month olds but not in 10 month olds. Finally, Salvadori et al. (2015), who used the box paradigm, found no statistically significant prosocial preference in 9 month olds either: across two experiments, only 56.3% of all participants choose the helper. Notably, sample sizes across studies, both those that did and those that did not find evidence for a prosocial preference in infants, were often small, rarely exceeding 32 participants (Margoni & Surian, 2018), which prompted Margoni and Surian (2018) to call for caution in interpreting the current evidence. Moreover, Margoni and Shepperd (2020) suggested that many of the failed replications might be explained by sampling error or simply by chance.

Nighbor et al. (2017) also cast doubt on the robustness of young infants' sociomoral preferences. The authors replicated the box paradigm in 5 to 10-month-old and 10–16-month-old infants and assessed infants' preference via preferential reaching. However, instead of choosing a puppet once, infants made five choices across repeated trials, to measure the stability of infants' choices. While the majority of infants chose the prosocial over the antisocial puppet in the first trial, across trials infants did not consistently choose the prosocial over the antisocial puppet. Dahl et al. (2013) found similar results when they presented the ball paradigm with human actors to 17 to 26-month-old infants and subsequently gave them the opportunity to help either the prosocial or the antisocial agent. This procedure was repeated three times, thus giving infants three opportunities to help one of the agents. Only the oldest, 26-month-old toddlers significantly preferred helping the prosocial agent in the first trial, while no helping preference emerged for the 17 month olds and 22 month olds. Across age groups, most toddlers helped both agents at least once during the three trials and this tendency to help both agents was unrelated to age (Dahl et al., 2013). Nighbor et al. (2017) conclude that their results question the robustness and consequently the reliability and validity of this measure of sociomoral preference.

While further research on the validity and reliability of these measures of infant sociomoral preferences are needed, a study by Tan et al. (2018) provides some evidence that early infant sociomoral preferences may be related to later behavioural and social adjustment. The researchers examined whether infants' preferences in sociomoral evaluation studies were associated with their moral and social adjustment in preschool, at age 3–6. Parents of 63 preschoolers who had participated in at least two sociomoral preference studies before the age of two were asked to complete questionnaires about their children's social, emotional, and behavioural functioning. Children's prosocial preference during infancy was assessed by their average response in sociomoral evaluation studies, which was calculated as to whether or not the infant chose the character behaving prosocially in a study rather than the one who did not, weighted by that study's effect size, and averaged across all studies the infant participated in. Results showed that infants who exhibited stronger prosocial preferences during sociomoral evaluation studies in their first two years of life had lower unemotional, callous traits compared to infants who showed lower prosocial preferences. Additionally, boys with stronger prosocial preferences showed fewer emotional and behavioural problems. These findings may, therefore, point to infant sociomoral preference being a building block for later moral development (Tan et al., 2018).

Specifically, infants' and toddlers' sociomoral preferences could be seen as an early aspect of moral cognitions, which reflect a child's understanding of moral rules and standards of conduct (Kochanska & Aksan, 2006). Infants' and toddlers' sociomoral preferences is seen by Hamlin and Wynn (2011) as the result of an evaluation of the prosocial and antisocial puppets' behaviour towards a third person, and since a majority of infants and toddlers tend to prefer the prosocial over the antisocial puppet, it seems like they could have evaluated the puppets using an early form of social evaluation, which lead them to conclude that prosocial, helping conduct might be

preferable to hindering behaviour (Hamlin et al., 2007). Such an early social evaluation would be in line with later, more mature, and commonly held moral cognitions of antisocial behaviour as morally bad and prosocial behaviour as morally good, underscoring the possibility that early sociomoral preference might be a building block for later moral cognitions.

1.3 | The role of empathy and attachment in toddlers' sociomoral preferences

As Margoni and Surian (2018) reported in their meta-analysis, across studies 64% of infants preferred the prosocial agent. Notably, that still leaves 36% of infants who chose the antisocial agent rather than the prosocial one, thus pointing to notable interindividual differences. To date, however, research on factors explaining these interindividual differences in sociomoral preference is mostly non-existent, with two exceptions. Cowell and Decety (2015) took into account interindividual differences by assessing toddlers' temperament and parents' disposition in perspective taking, but found neither of those factors to be related to toddlers' preference in the hill paradigm. Shimizu et al. (2018) found that the number of mothers' socially evaluative comments, while watching the box and ball paradigms with their infants was associated with a higher likelihood of choosing the prosocial puppet in their children. Infants' sociomoral preference had been assessed before mothers watched the box and ball paradigms with their infants, to ensure that infants' choices were not influenced by having listened to their mothers' comments on the box and ball paradigm.

Two other factors that may influence toddlers' choices in the puppet task are toddlers' empathy and the parent-child attachment quality (Kochanska & Aksan, 2006; Vaish et al., 2009). Empathy, the ability to effectively respond to others' emotions (Rieffe et al., 2010), is a moral emotion, since empathy and empathic concern can motivate individuals to "do good" (Moll & de Oliveira-Souza, 2007). As a moral emotion, empathy is also part of a person's conscience, which can be defined as an inner guiding system that ensures that people comply with societal rules and norms independently and without external control (Kochanska & Aksan, 2006). A person's conscience consists of multiple self-regulatory and interconnected processes encompassing moral emotions (such as empathy), cognition (of which sociomoral preference could be an early aspect or building block), and behaviour (Kochanska & Aksan, 2006). To the best of our knowledge, previous research has not examined the links between moral emotions such as empathy and sociomoral preference or other potential aspects of early moral cognitions in toddlers or infants. Research has found such links in children preschool-aged and older, however, with higher levels of empathy being related to more mature levels of moral cognition or reasoning (e.g., using moral reasoning focusing on others' needs or approval rather than on their own needs; Carlo et al., 2011; Miller et al., 1996). Regarding toddlers' sociomoral preference specifically, toddlers with higher empathy might be more emotionally attuned to how the protagonist would feel when being helped or hindered. Given that empathic arousal can elicit feelings of compassion or sympathy for others (Miller et al., 1996), toddlers with higher empathy might feel more compassion with the protagonist and might be more likely to reject the antisocial puppet (and prefer the prosocial puppet). In contrast to that, toddlers with lower empathy might be less focused on the emotional aspects of the puppet play. Thus, we would expect children with higher empathy to be more likely to choose the prosocial over the antisocial character.

Additionally, toddlers' sociomoral preference may also be associated with their attachment security, since children's conscience development has been frequently theorised to be associated with the quality of the parent-child attachment relationship (Gross et al., 2017; Kochanska et al., 2004; Stern & Cassidy, 2018). According to attachment theory, children possess a biologically based attachment system predisposing them to form attachments with their caregivers and to use their caregivers as a secure base from which to explore the world and to which they can return to seek help and protection in the face of threats (Bowlby, 1969/1982; Dykas & Cassidy, 2011; Gross et al., 2017). Based on their interactions with their primary caregivers within these attachment relationships, infants begin to form general expectations of how their caregivers may behave (Bowlby, 1969/1982;

Gross et al., 2017). Over time, these expectations expand into generalisations about other people more broadly and children form more generalised mental representations or internal working models (IWMs) about others, themselves, and the world around them (Bowlby, 1969/1982; Gross et al., 2017). These IWMs can then affect how children process future social experiences and how they behave towards others (Johnson et al., 2010).

Securely attached infants, who repeatedly experienced interactions with a caregiver who is available, empathically attuned, and responsive to the infant's needs and cues (Ainsworth et al., 1978; Stern & Cassidy, 2018), develop expectations of other people as trustworthy, helpful, and deserving of care (Gross et al., 2017). Securely attached children may also develop a secure base script of distress being responded to with care, based on how they typically experience their caregiver respond to the infants' distress signals (Gross et al., 2017; Waters & Waters, 2006). These scripts create expectations and help organise and prepare children's own behaviour in situations of distress (Waters & Waters, 2006). In short, securely attached children develop helpful, prosocial expectations of how to treat others, especially those in distress or in need of help, which may result in them behaving prosocially more often (Govrin, 2014).

Insecurely attached infants, however, who experience non-responsive or inconsistent caregivers who are rejecting, intrusive or misattuned, may develop expectations of others as more hostile or rejecting and less trustworthy (Gross et al., 2017; Stern & Cassidy, 2018). Consequently, they may develop IWMs and scripts that undermine prosocial behaviour, thus resulting in them behaving prosocially less often (Gross et al., 2017).

Previous research has found evidence for an association between infants' attachment security with their caregiver and their perceptions of social interactions: securely attached infants expect caregivers in animated scenarios to provide comfort to children, while insecurely attached infants do not (Johnson et al., 2007, 2010). These findings suggest that the quality of toddlers' attachment experiences could also affect their perception of other social interactions. Given that the Hamlin puppet play depicts social interactions between a protagonist and a prosocial or antisocial puppet, the perception of these interactions and toddlers' subsequent choice for one of these puppets may also be associated with the quality of toddlers' attachment experiences. Specifically, when watching the puppet play, securely attached toddlers who have developed IWMs of others as helpful and caring might prefer the puppet whose behaviour is in line with these expectations (Thompson, 2006), that is, the prosocial puppet. Furthermore, securely attached toddlers might view helping, caring behaviour by others as the "correct" behaviour and might reject the puppet who does not show these behaviours. Insecurely attached toddlers may also prefer the puppet whose behaviour fits their expectations of how others behave and might see such familiar behaviour as "correct". However, since insecurely attached toddlers tend to develop IWMs of others as hostile or rejecting (Gross & De Dreu, 2017; Stern & Cassidy, 2018), they might prefer the antisocial puppet, whose behaviour is more in line with these expectations.

Previous research has focused on mother-child attachment relationships, paying less attention to the impact of the father-child attachment relationship on children's conscience development (Kochanska & Aksan, 2006). Those studies examining both mothers' and fathers' relationship with their children reported that the mother-child relationship may be more important for infants (Kim & Kochanska, 2012; Kochanska et al., 2005), whereas in toddlerhood positive relationships with both mother and father become important (Kochanska & Kim, 2014). Thus, the hypothesised association between the parent-child attachment relationship and toddlers' sociomoral preference might differ based on the parent's gender. Additionally, these hypothesised associations might also differ based on child gender. Mothers and fathers have been reported to parent their toddler-aged boys and girls differently, which may affect the quality of their parent-child attachment relationship. Chaplin et al. (2010), for example, found that mothers responded less punitively and with more support to boys' anger than to girls'. Fathers, moreover, cuddled more with their daughters (Snow et al., 1983) and preferred rough-and-tumble play with their sons (Eccles et al., 2000). Furthermore, maternal parenting has been shown to have a stronger influence on the girls' development of prosocial behaviour compared to boys (Eisenberg et al., 1992).

1.4 | The present study

In summary, the present study examined whether 24-month-old toddlers prefer a prosocial to an antisocial agent and whether empathy and parent-child attachment was associated with toddlers' sociomoral preference. The study population of 24 month olds was chosen to extend research on the sociomoral preference of toddlers aged 18 months or older, given that the majority of research examining children's sociomoral preference has focused on 6–18 month olds (Margoni & Surian, 2018). Furthermore, the moderating effects of child gender on the potential associations between parent-child attachment quality and toddlers' sociomoral preference were examined, to explore potential gender-differential effects of the impact of mothers' and fathers' attachment relationship.

2 | METHODS

2.1 | Participants

This study was part of a larger longitudinal study examining the effectiveness of video interaction guidance (VIG) after premature childbirth (Tooten et al., 2012). Participants were recruited in eight hospitals in the Netherlands and consisted of infants born full term, moderately prematurely (≥ 37 weeks gestational age (GA)), and extremely prematurely (<32 weeks GA) together with their parents. Parents and their children were excluded from participation if parents' Dutch language skills were insufficient to participate in the study. All participating parents provided written informed consent. The study received ethical approval from the Medical Ethical Committee of the Catharina Hospital in Eindhoven and was carried out in accordance with the ethics guidelines of the American Psychological Association.

The present study was conducted with a subsample of parents and their toddlers participating in the larger longitudinal project and was carried out during the project's two-year follow-up when toddlers were 24 months old. Out of the 219 participants taking part in the first wave of the study, 173 participants (79.0%) took part in the two-year follow-up. The puppet task was added to the two-year-follow-up measures as part of the master thesis of the second author a few months after the start of the follow-up, meaning that the puppet task was not carried out with all participating toddlers.

The puppet task was carried out in 117 of the 173 participants at follow-up (67.6%). Out of this sample, 10 toddlers were excluded from the analyses, since they did not make a choice in the puppet task. Therefore, the final sample consisted of 107 toddlers (54.2% girls, $m_{\text{age}} = 24.40$, $SD = 1.57$) and their parents (102 mothers, 102 fathers). Demographic characteristics of this final sample can be found in Table 1. Excluded and non-excluded toddlers and their parents did not differ in any demographic variables. Of the parents with toddlers born prematurely (64 of the 107 toddlers), the parents of 31 toddlers (48.4%) had been randomised into the VIG intervention group at the start of the larger longitudinal study and had received three sessions of VIG in the first week after the birth of their child. The parents of the remaining 33 toddlers born prematurely (51.6%) had been randomised into the control group and had received usual care. In this larger study sample and at 6 months post-intervention, VIG was found to be effective in increasing sensitive parenting behaviour and reducing withdrawn behaviour in both mothers and fathers, and had positive effects on parental bonding, particularly for fathers (Hoffenkamp et al., 2015).

2.2 | Procedure

Data collection was carried out via home visits, which took about two hours. Home visits were scheduled at a time which was convenient for mothers and fathers and when their toddler was awake. During the home visits, parents

TABLE 1 Participant characteristics of the final study sample

Variable	Mean (SD) or %
Children (<i>n</i> = 107)	
Age (months)	24.40 (1.57)
% Female	54.2%
% First-born child	61.7% (mother's first child)
	60.4% (father's first child)
Preterm status	
Extremely preterm	29.9%
Moderately preterm	29.9%
Full-term	40.2%
Mothers (<i>n</i> = 102)	
Age (years)	34.61 (4.78)
Nationality (% Dutch)	91.6%
Level of education ^a	
Low	12.4%
Medium	33.3%
High	54.3%
Fathers (<i>n</i> = 102)	
Age (years)	36.56 (4.91)
Nationality (% Dutch)	92.5%
Level of education ^a	
Low	20.8%
Medium	26.7%
High	52.5%

^aLevel of education was classified as follows: low = no education, primary school or lower secondary education; medium = higher secondary or pre-university education or community college; high = university education (bachelor's or master's degree).

completed an empathy questionnaire, observations to assess parents' attachment quality with their child took place, and a sociomoral preference puppet task was carried out.

2.3 | Measures

2.3.1 | Empathy

Toddlers' empathy was measured using the Empathy Questionnaire (EmQue; Rieffe et al., 2010). The 19-item EmQue—which, to the best of our knowledge, is the only validated questionnaire measuring empathy in young children—asks parents to rate the degree to which each item reflects their toddlers' everyday empathic behaviour over the past 2 months on a scale from 0 (*never*) to 2 (*often*). The EmQue consists of the subscales *emotion contagion* (example question: “When another child cries, my child gets upset, too”), *attention to others' feelings* (e.g., “My child looks up when another child laughs”), and *prosocial actions* (e.g., “When another child starts to cry, my

child tries to comfort him/her"). In the current study, a mean score was computed of all items across subscales, separately for mother-reported and father-reported responses, to obtain one comprehensive measure of child empathy (Ketelaar et al., 2017). The EmQue has previously shown satisfactory criterion and concurrent validity and reliability (Lucas-Molina et al., 2018; Rieffe et al., 2010), as well as measurement invariance across time and gender (Grazzani et al., 2017; Lucas-Molina et al., 2018). In the current study, reliability was acceptable (mothers: Cronbach's $\alpha = .75$; fathers: $\alpha = .76$). Because mothers' and fathers' reports of their toddlers' empathy only correlated weakly, separate mother-reported, and father-reported empathy variables were used in the analyses.

2.3.2 | Attachment

Parent-child attachment security was assessed by two trained observers (the second and the third author) using the Attachment Q-sort (AQS; Waters & Deane, 1985). Toddlers and their parents were observed for at least two hours and then sorted 90 statements describing the child's attachment behaviour towards each parent along a nine-category distribution, which represented the degree to which each statement applied to the child. Attachment security was then calculated by correlating the child's Q-sort description with the Q-sort of a prototypically secure child, which has been determined by experts (Waters, 1995). Attachment scores could range from +1.00 (perfectly secure) to -1.00 (most insecure) and were calculated separately for toddlers' attachment with their mother and their father. Both observers were thoroughly trained by the fourth author, who has extensive experience with applying the AQS. The Attachment Q-sort has shown adequate convergent, discriminant, and predictive validity (Ijzendoorn et al., 2004). Reliability checks between the two observers were conducted on a random sample of ten mother-toddler dyads throughout the study and resulted in an inter-rater reliability of .81, which exceeds the AQS standards of .75 (Waters, 1995).

2.3.3 | Sociomoral preference

Toddlers' sociomoral preference was assessed using the box paradigm of the social evaluation puppet task by Hamlin and Wynn (2011), which was carried out as follows: During the task, a protagonist, a duck puppet, tried to open a blue gift box. At the beginning of each trial, the protagonist started out in the left corner (from the child's point of view) and attempted to open the box twice by pulling at the cover of the box. When the protagonist then tried to open the box a third time, either the helper or the hinderer appeared. The helper supported the protagonist in opening the box, while the hinderer prevented the protagonist from opening the box by jumping onto it. The helper and the hinderer were depicted by a donkey and a cow puppet, neither of whom wore any clothes. Helping and hindering status was counterbalanced.

Procedure

During the puppet task, one of the parents was sitting on a chair in front of a table, with their child on their lap. A few toddlers were placed in a highchair if they were at ease with that, and their parent was always nearby. The puppet play was carried out on the other end of the table by an experimenter. If toddlers got distracted during the play, their mother kindly directed their attention back to the puppet play. Other than that, mothers were asked not to give further instructions or to respond verbally or emotionally to the puppet play. To ensure habituation to the puppet play, all toddlers were shown the play two times. The order of helping and hindering scenarios was counterbalanced across participants. The entire procedure was videotaped, to code toddlers' sociomoral choice after the experiment.

Choice test

After toddlers had seen the box scenario twice, the experimenter took the helper and hinderer puppets out of a box and presented them to the toddler, by holding one puppet in each hand and out of the child's reach. Which hand the experimenter held the helper and hinderer in (right, left) was counterbalanced across participants. After ensuring that the toddler had looked at both puppets and at the experimenter, the experimenter asked "Which puppet would you like to play with?" and moved both puppets within the child's reach. No additional instructions or suggestions were given by the experimenter or by the parents. A toddler's choice was coded as the puppet the child reached for.

2.4 | Statistical analyses

To test whether toddlers preferred the prosocial to the antisocial character, exact binomial tests were carried out. Potential group differences in sociomoral preference between girls and boys were examined using Chi-square tests. Since, due to the nature of the larger, longitudinal study, the study sample consisted of toddlers born extremely preterm, moderately preterm, and full term, and since some of their parents had received VIG, while others had not, potential differences between these groups were also examined using Chi-square tests. Then, it was investigated whether toddlers' empathy or parent-child attachment was associated with their sociomoral preference. Descriptive statistics of and correlations between all these variables were calculated first. For all empathy and attachment variables, group differences between extremely preterm, moderately preterm, and full-term toddlers as well as between toddlers whose parents received VIG and those who received usual care were examined using *t*-tests and one-way ANOVAs. Then, binary logistic regression analyses were conducted to investigate these potential associations, after standardising all continuous predictors. Two regression analyses were carried out: a mother-focused analysis, including mother-reported child empathy and mother-child attachment, and a father-focused analysis, including father-reported child empathy and father-child attachment. Mother- and father-related variables were analysed separately particularly due to the relatively high correlation between mother-child and father-child attachment ($r = .78$). After adding the empathy and mother-child or father-child attachment predictors, child gender and the interaction term between attachment and gender was added to both models, to explore any potential gender differential effects of the impact of mother-child and father-child attachment quality. Finally, to ensure that the results of our regression analyses were not moderated by children's prematurity status or by some parents having received VIG, while others did not, we conducted two separate regression analyses with additional interaction terms between VIG status and all predictor variables.

3 | RESULTS

3.1 | Choice test

Toddlers significantly preferred the prosocial to the antisocial puppet, with 60.7% (65 of 107 toddlers) choosing the prosocial puppet (binomial test, 2-tailed: $p = .03$). Toddlers' choice pattern did not differ significantly by gender, with 58.6% of girls and 63.3% of boys choosing the prosocial puppet ($p = .62$), or by preterm status, with 56.3% of extremely preterm, 65.6% of moderately preterm, and 60.5% of full-term toddlers choosing the prosocial puppet ($p = .74$). Whether or not parents had received VIG after their child's birth was not associated with toddlers' choice: 63.6% of toddlers whose parents received VIG preferred the prosocial puppet, compared to 58.1% of toddlers whose parents did not receive VIG ($p = .65$).

3.2 | Descriptive statistics for and correlations between empathy, attachment, and sociomoral preference

Means and standard deviations for empathy and attachment can be found in Table 2. There were no significant group differences between extremely preterm, moderately preterm, and full-term children on any of the empathy or attachment variables (all p 's > .05). Whether parents had received VIG or not was also not associated with children's scores on any empathy or attachment variables (all p 's > .05).

Correlations between all study variables can be found in Table 3. Mothers' and fathers' reports of their child's empathy correlated weakly ($r(87) = .22, p = .04$). The quality of both the mother-child and the father-child attachment relationship was significantly correlated with mothers' reports of their child's empathy only (mothers: $r(94) = .23, p = .03$; fathers: $r(89) = .25, p = .02$). The quality of the mother-child and the father-child attachment relationship was highly correlated ($r(96) = .78, p < .001$). Children's sociomoral preference did not correlate with child gender or any empathy or attachment variables (all p 's > .05).

3.3 | Predictors of toddlers' sociomoral preference

Neither mother-reported or father-reported child empathy nor mother-child or father-child attachment were significantly associated with toddlers' choice in the puppet task (Tables 4 and 5). There was also no significant interaction effect between child gender and mother-child or father-child attachment on children's sociomoral preference. Children's prematurity status or whether parents had received VIG or not did also not significantly moderate the associations between empathy or attachment and children's preference (all p 's > .05).

4 | DISCUSSION

In the present study, the majority (60.7%) of 24-month-old toddlers presented with the box scenario (Hamlin & Wynn, 2011), in which a protagonist tries to open a box and is helped by a prosocial character and hindered by an antisocial character, preferred the prosocial to the antisocial character via preferential reaching. At the same time, more than a third of the toddlers (39.3%) chose the antisocial over the prosocial character. Toddlers' choice for the prosocial or the antisocial character was neither associated with their mother-reported or father-reported empathy nor with the quality of the mother-child or father-child attachment relationship.

These results extend previous evidence of an overall preference for prosocial, helping over antisocial, hindering behaviours in young children (Holvoet et al., 2016; Margoni & Surian, 2016), to somewhat older, 24-month-old toddlers, who have received little attention so far. Only two studies who assessed sociomoral preference via preferential reaching have previously included 24-month-old toddlers in their study samples, although neither study focused specifically on this age group. Scola et al. (2015) found a preference for the prosocial character in

TABLE 2 Means and standard deviations for child empathy and attachment

Measures	<i>n</i>	<i>m</i>	<i>SD</i>	Minimum–Maximum
Mother-reported empathy	95	0.88	0.26	0.29–1.46
Father-reported empathy	88	0.80	0.24	0.20–1.44
Attachment				
Mother	101	0.54	0.21	0.03–0.80
Father	96	0.51	0.22	–0.01–0.80

TABLE 3 Correlations between all study variables

Measure	1	2	3	4	5	6
1. Child gender	–					
2. Mother-reported empathy	–.07	–				
3. Father-reported empathy	–.05	.22*	–			
4. Mother-child attachment	–.06	.23*	–.08	–		
5. Father-child attachment	.01	.25*	.06	.78**	–	
6. Sociomoral preference ^a	.05	–.09	.08	.12	.10	–

^aSpearman's *rho* was used for all correlations including the variable *sociomoral preference*, since this variable is a proportion. Pearson's *r* was used for all other correlations.

* $p < .05$; ** $p < .01$.

TABLE 4 Logistic regression analysis for mother-reported child empathy, mother-child attachment, child gender, and the interaction between child gender and attachment predicting children's prosocial preference in the puppet task ($\chi^2(4) = 5.23$, Nagelkerke $R^2 = .07$; $p = .27$)

Predictor	B	SE B	Wald χ^2	p	OR	95% CI OR
Mother-reported empathy	–0.31	0.23	1.75	.19	0.74	[0.47; 1.16]
Mother-child attachment	0.33	0.68	0.24	.63	1.39	[0.37; 5.25]
Child gender	0.40	0.44	0.82	.37	1.49	[0.63; 3.56]
Attachment \times Gender	0.07	0.44	0.03	.87	1.08	[0.45; 2.55]
Constant	–0.09	0.68	0.02	.89	0.91	

TABLE 5 Logistic regression analysis for father-reported child empathy, father-child attachment, child gender, and the interaction between child gender and attachment predicting children's prosocial preference in the puppet task ($\chi^2(4) = 7.94$, Nagelkerke $R^2 = .12$; $p = .09$)

Predictor	B	SE B	Wald χ^2	p	OR	95% CI OR
Father-reported empathy	0.21	0.23	0.81	.37	1.23	[0.78; 1.95]
Father-child attachment	0.18	0.73	0.06	.81	1.20	[0.29; 5.04]
Child gender	0.58	0.48	0.81	.37	1.78	[0.70; 4.52]
Attachment \times Gender	0.24	0.47	0.27	.61	1.28	[0.51; 3.22]
Constant	–0.23	0.73	0.10	.75	0.80	

the age groups of 12–24 month olds (mean age = 19 months) and 24–36 month olds (mean age = 32 months) when presenting them with the ball game paradigm, but Cowell and Decety (2015) did not find a prosocial preference in 12–24 month olds (mean age = 18.69 months) using the hill paradigm. Two studies using helping behaviour instead of preferential reaching provide additional evidence for a prosocial preference in toddlers at that age. Dahl

et al. (2013) gave 16 to 27-month-old toddlers the choice to help either a person who had previously behaved prosocially or a person who had previously behaved antisocially in the ball paradigm and reported that 26 month olds preferred to help the prosocial person first. In contrast, the younger 17-month-old and 22-month-old toddlers did not show such a prosocial preference (Dahl et al., 2013). Similarly, Surian and Franchin (2017) found evidence for 25 month olds preferring to help an actress who had previously behaved fairly in the allocating goods paradigm, compared to an actress who had behaved unfairly. These results also point towards the existence of a prosocial preference in 2-year-old toddlers.

With 60.7% of toddlers preferring the prosocial character in the present study, this percentage is in line with the overall percentage of 64% (CI [60% to 69%]) estimated by Margoni and Surian (2018) in their meta-analysis based on all published and multiple unpublished studies and adjusted to account for publication bias. Notably, our finding that 60.7% of toddlers preferred the prosocial over the antisocial character is also right in between Scola et al.'s (2015) findings (76.9% preferred the prosocial character in the original condition) and Cowell and Decety's (2015) results (50.0% preferred the prosocial character). While our study slightly strengthens previous evidence for a prosocial preference in toddlers around the age of 24 months, it, therefore, also points out that the apparent interindividual differences at that age should not be neglected.

These interindividual differences might not necessarily mean that toddlers do not possess a natural preference for prosociality. Alternatively, these differences could indicate that toddlers' natural tendencies regarding prosocial and antisocial others might be modifiable from a relatively young age. Either way, these significant interindividual differences in toddlers' choices emphasise the importance of uncovering explanatory factors for such differences. In an attempt to do so, we examined associations between sociomoral preference and toddlers' empathy or the quality of parent-child attachment relationships. However, we found no evidence for an association between empathy and sociomoral preference, despite previous research indicating that empathy may be related to other, more cognitive forms of morality (Prinz, 2006; Vaish et al., 2009). Notably, mothers' and fathers' reports of their toddler's empathy correlated only slightly, casting doubt on the validity of our parent-report empathy measure. It is thus unclear whether mothers' or fathers' description of their child's empathy is more accurate or how accurate they truly are. Future research should, therefore, examine associations between toddler empathy and sociomoral preference by different measurement approaches for empathy, such as a combination of observations, questionnaires, and/or vignettes.

Alternatively, our findings of a lack of an association between toddlers' empathy and sociomoral preference may indicate that such an association does, indeed, not exist, at least not in our study sample, despite theoretical and empirical evidence suggesting that different components of an individual's conscience are often interconnected (e.g., Kochanska & Aksan, 2006; Vaish et al., 2009). There may be multiple explanations for this finding. For one, the association between sociomoral preference and empathy may be developmentally constructed and may only emerge consistently later in life, as children gain greater cognitive and regulatory skills. After all, associations between other aspects of children's conscience, such as moral behaviour, and empathy have also been suggested to develop throughout childhood and adolescence (Thompson, 2014). Alternatively, empathy might simply not be relevant to children's choices in the puppet play. Even though both concepts are thought to be part of a toddler's conscience, given that conscience is such a broad and multidimensional construct, not all parts within a toddler's conscience might be related to each other. Children's sociomoral preference might be a more intuitive and innate phenomenon, especially considering how early it can be found in children, rather than something that develops over time, like empathy and other aspects of toddlers' conscience.

The mother-child and father-child attachment quality was not associated with toddlers' sociomoral preference either. This is surprising, given previous studies' findings of positive, warm, reciprocal parent-child relationships as an important factor for conscience development (Kochanska & Aksan, 2006). Perhaps, rather than the overall attachment, only specific aspects of the parent-child relationship might be associated with toddlers' sociomoral preference. One of those might be parents' discipline style regarding toddlers' misbehaviour, which has been associated with conscience development before (Kochanska & Aksan, 2006). Kochanska and Aksan (2006) suggested

that gentle discipline strategies, which utilise inductive methods rather than power assertion, foster positive, reciprocal interactions between a parent and their toddler. Ultimately, these strategies can increase the toddler's willingness to go along with their parents' agenda and to learn from them (Kochanska & Aksan, 2006). Toddlers may thus be more willing and able to internalise their parents' teachings, including being taught that helping and being kind to others are good behaviours. Toddlers who have begun to internalise these views may be more likely to expect these behaviours from the characters in the puppet play and may be more likely to reject the puppet not behaving that way, that is, the antisocial puppet.

Alternatively, the associations between attachment and toddlers' sociomoral preference may be indirect, working through mediators only, may only exist for a subgroup of toddlers, or attachment might only unfold its full impact on toddlers' sociomoral preference in combination with other factors, such as toddlers' temperament (Stern & Cassidy, 2018). The latter is in line with research reporting that maternal responsiveness was associated with less externalising behaviour for children with a difficult temperament but not for children with easy temperaments (Kochanska & Kim, 2013). Future research should, therefore, examine associations between toddlers' sociomoral preference and their temperament as well as parents' discipline style and other specific aspects of the mother-child and father-child relationship.

Again, our findings of no significant associations between parent-child attachment and toddler sociomoral preference might also reflect the reality that such an association does not exist, at least not in this study sample. Stern and Cassidy (2018) theorised that the association between attachment and empathy may be developmentally constructed and may only emerge consistently as children grow older. The same could also apply to the association between attachment and sociomoral preference. Given that toddlers' IWMs, which they develop in the context of interactions with their attachment figures, are cognitive constructs (Stievenart et al., 2011), they may change and grow in complexity due to increases in children's cognitive abilities (in addition to changing and growing due to further interactions and experiences with caregivers as children grow older). Particularly the process of generalisation of IWMs, from caregiver-specific representations to more general representations about others, whose exact timing, development, and mechanisms are still largely unknown (Sherman et al., 2015), may be an important prerequisite for finding consistent associations between attachment and sociomoral preference. Thus, the IWMs of our 24-month-old toddlers might not yet be developed enough to find such an association between attachment and sociomoral preference.

Additionally, as mentioned above, toddlers' sociomoral preference might be an intuitive, innate phenomenon, which is not learned in the context of toddlers' primary attachment relationships and would, therefore, not be associated with the quality of toddlers' attachment relationships. Finally, the quality of parent-child attachment across our sample was rather high, with only a single father-child attachment relationship receiving a score slightly below zero. The lack of significant associations between attachment and toddlers' sociomoral preference might, therefore, be due to the somewhat limited variation in parent-child attachment across our sample.

The present study had a number of strengths. We examined toddlers' sociomoral preference in a sample of 24 month olds, an age group that has not received much attention in previous studies, and we did so with an adequately large sample. Moreover, our study is amongst the first to investigate potential explanatory factors for interindividual differences in toddlers' sociomoral preferences and did so by including both maternal and paternal measures (namely, attachment and child empathy).

Nevertheless, this study is not without limitations. Parents in our sample consisted predominantly of highly educated Dutch nationals who were living together, which limits the generalisability of our results. Therefore, further research in more diverse populations is needed. Furthermore, our conclusions of no significant associations between attachment or empathy and children's sociomoral preference could have also been due to the true effect size of these associations being smaller than what we would have been able to detect, given our current sample size. However, we estimate that it is unlikely that any effects we could have missed would have been *practically relevant* effects when it comes to understanding interindividual differences in toddlers' sociomoral preference. We have concluded this for two reasons: First, Ferguson (2009) suggests that practically relevant effects in social

science data may be those with an OR of 2.0 or larger. In our study, we had more than 80% power to detect an OR of 2.0 or larger. In an effort to explore what could be considered a practically relevant effect for our particular study, we additionally examined the effect sizes of previous studies on associations between attachment or empathy and measures of morality or prosociality in toddlers and preschool children. These studies tended to report moderate effect sizes, larger than Ferguson's (2009) suggested cut-off for practical relevance (e.g., Kochanska et al., 2005; Laible, 2006; Vaish et al., 2009; all ORs > 3.5). We, therefore, concluded that the likelihood of having missed a practically relevant effect appeared to be small and that attachment and empathy seem less relevant for understanding interindividual differences in toddlers' sociomoral preference than they do for other aspects of toddlers' morality—at least in our current study. Future research investigating which factors may be associated with interindividual differences in children's sociomoral preference in the puppet task should, therefore, look beyond (just) child empathy and parent-child attachment.

Furthermore, while the choice test is thought to assess toddlers' preference for one puppet over the other, this might not always be the case on an individual level. After all, some toddlers might simply choose the puppet they are looking at when being asked to select a puppet, or they might randomly grab the puppet they find easier to reach. Finally, we have viewed toddlers' sociomoral preference as the result of their social evaluation of the actions exhibited by the characters in the puppet play (Hamlin et al., 2007) and have hypothesised that toddlers' sociomoral preference could be an early precursor or building block for later morality, specifically regarding children's later understanding of moral standards of conduct and rules (Kochanska & Aksan, 2006). However, whether this view of toddlers' sociomoral preference as an indicator of (later) morality is accurate is still not fully clear. Researchers have raised questions about whether—rather than toddlers' social evaluations of the puppets' actions—other aspects of the puppet play, like the characters' movements, may be driving toddlers' choices (Scarf et al., 2012). Others have raised questions about whether toddlers truly see the puppets as people and evaluate their actions the same way they would evaluate a person's social actions (Packer, 2020). While there is some evidence for toddlers seemingly evaluating animated characters the way they do people (e.g., Gergeley et al., 1995) and for sociomoral preference being an early aspect or building block of later moral behaviour (Tan et al., 2018), these questions still require further research. In particular, further longitudinal research is needed to examine whether toddlers' early sociomoral preference is predictive of later moral behaviour.

In conclusion, the present study found evidence for a slight majority of 24-month-old toddlers preferring a prosocial over an antisocial agent. Nevertheless, a portion of toddlers chose the antisocial over the prosocial agent, pointing to notable interindividual differences. Neither toddlers' empathy nor parent-child attachment quality as potential explanatory factors for such interindividual differences were associated with toddlers' sociomoral preference. Further research into these and other potential explanatory factors for the observed interindividual differences is needed.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.



ETHICAL APPROVAL

This study was approved by the Medical Ethical Committee of the Catharina Hospital in Eindhoven.

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