Nice traits or nasty states : dispositional and situational correlates of prosocial and antisocial behavior in childhood

Wildeboer, A.

Chapter 3

Anxiety and social responsiveness moderate the effect of situational demands on children's donating behavior

Andrea Wildeboer, Sandra Thijssen, Marian J. Bakermans-Kranenburg,
Vincent W. V. Jaddoe, Tonya White, Henning Tiemeier,
& Marinus H. van IJzendoorn

Merrill-Palmer Quarterly: Journal of Developmental Psychology (in press)

Abstract

Donating behavior may be partly situation specific, but may also depend upon child characteristics such as empathy and inhibition. Moreover, susceptibility to situational demands might differ depending on child characteristics, for example children's level of anxiety and social responsiveness. We examined how donating was associated with situational and child characteristics in a sample of 221 8-year-old children. Children were shown a promotional clip for a charity (UNICEF) including a call for donation. For a random half of the children, the video-fragment ended with a probe of a same-sex peer donating money to the charity. Children could decide privately whether they wanted to donate. Seeing a peer donate was associated with higher donations. Empathy and inhibition were not related to donating. Anxiety and social responsiveness moderated the effect of the situational manipulation on donating. Anxious children and children with less social responsiveness problems were more affected by the situational manipulation, and donated more after seeing the donating peer than less anxious children and children with more social responsiveness problems. Moreover, in absence of the donating peer, anxious children donated less money than less anxious children. Our results indicate that donating behavior is dependent on situational demands, and the situational effect differs depending on children's level of anxiety or social responsiveness.

Introduction

Donating behavior is one of many forms of prosocial behavior (Warneken & Tomasello, 2009a; Dunfield, Kuhlmeier, O'Connel, & Kelley, 2011). While several studies have shown a link between donating and specific child characteristics, such as empathy (e.g. Krevans & Gibbs, 1996), other studies suggest that donating behavior is largely situation-specific, with little influence of child characteristics (e.g. Van IJzendoorn, Bakermans-Kranenburg, Pannebakker, & Out, 2010). Although it is unclear whether child characteristics explain variance in donating behavior above and beyond situational demands, certain child characteristics may act as moderator and make a child more susceptible to environmental input (Belsky, Bakermans -Kranenburg, & Van IJzendoorn, 2007). Therefore, the current study examines both dispositional and situational effects as potential contributors to variation in children's donating behavior, and explores whether children differ in their sensitivity to situational cues.

Prosocial behavior can be defined as voluntary behavior intended to benefit another individual (Eisenberg, Fabes, & Spinrad, 2007). It has been related to beneficial outcomes later in life, including better social adjustment (e.g. Crick, 1996) and academic achievement (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000**).** Different forms of prosocial behavior are not necessarily related (Dunfield et al., 2011) and are shown to have different underlying mechanisms (Paulus, Kühn-Popp, Licate, Sodian, & Meinhardt, 2013). In this study we focus on donating behavior, as a type of prosocial behavior that is beneficial to society. We focus on what may be considered costly altruistic behavior, as something is given up without the expectation of anything in return (Van IJzendoorn et al., 2010).

There are two different lines of research on the precursors of donating behavior. Several studies assume that donating is driven by characteristics of the benefactor and thus stems from a dispositional trait (e.g. Eisenberg, et al., 1996; Litvack-Miller, McDougall, & Romney, 1997). Inhibition and empathy are among the most frequently identified person characteristics associated with donating. For example, young children with better performance on an inhibition task shared more candy with another participant in a dictator game and higher levels of inhibitory control were associated with higher numbers of stickers children were willing to share (Aguilar-Pardo, Martínez-Arias, & Colmenares, 2013; Moore, Baressi & Thompson, 1998;

Paulus et al., 2015). Children with higher levels of inhibition may show more moral virtuous behavior because of their ability to control their (initial) behavioral responses to keep their possessions for their own use and pleasure (Aguilar-Pardo et al., 2013; Pears, Fisher, Bruce, Kim, & Yoerger, 2011). Empathic feelings are thought to increase the altruistic motivation to help others (Batson, Duncan, Ackerman, Buckley, & Birch, 1981). Higher levels of empathy in adults have been related to higher donations (Batson & Ahmad, 2001; Verhaert & Van den Poel, 2011; Webb & Wong, 2014). In a similar vein, a positive association between self-reported empathy and prosocial behavior (including donating to a charity) was found in children (Krevans & Gibbs, 1996).

However, another line of research shows that donating behavior is mostly driven by situational demands, rather than characteristics of the benefactor. For example, being observed is found to substantially increase generosity in both adults and children (e.g. Haley & Fessler, 2005; Nettle et al., 2013; Powell, Roberts, & Nettle, 2012; Van IJzendoorn et al., 2010). Children shared more when watched by another peer than in situations in which they were alone (Engelmann, Herrmann, & Tomasello, 2012; Leimgruber, Shaw, Santos, & Olson, 2012) and adult participants who donated in pairs gave more than participants who donated alone (Reyniers & Bhalla, 2013). Reputational effects, peer pressure, or norm compliance are likely to play a role in such cases (Engelmann et al., 2012; Kallgren, Reno, & Cialdini, 2000; Powell et al., 2012; Reyniers & Bhalla, 2013). A situational effect of moral exemplars on donations was also found. After watching a video clip or reading a story on morally virtuous behavior, students donated more to a charity (Freeman, Aquino, & McFerran, 2009). Such modelling effects were also found for other types of prosocial behavior (e.g. Kallgren et al., 2000). Modelling might increase moral elevation or might make people aware of social norms which they are eager to comply to, resulting in prosocial behavior (Freeman et al., 2009; Kallgren et al., 2000). In line with social learning theory, according to which new behavior can be learned from direct observation of such behavior, modelling can also provide individuals with an example on how to act in a (new) situation (Bandura, 1977). Effects of modelling on donating behavior in children are largely unknown.

While both dispositional and situational factors are thus identified as correlates of donating behavior, these factors are often studied separately. However, one study suggests that situational factors might override the effect of personal characteristics on donating behavior in children

(Van IJzendoorn et al., 2010). For other types of prosocial behavior, it was also found that situational factors can override dispositional influences on prosocial behavior. For example, children's social responsibility influenced their helpfulness only when perceived peer pressure was low (Pozzoli & Gini, 2010).

Although the direct effect of person characteristics on donating behavior might be overridden by situational demands, other dispositional factors (not necessarily related to donating behavior) might influence a child's sensitivity to situational demands and thereby affect the amount of donated money. Two of these factors are autistic traits and anxiety. As an example, in a study on the effect of the presence of an observer during donations, typically developing adults donated more often to a charity in the presence of an observer, whereas this was not true for participants with autistic traits (Izuma, Matsumoto, Camerer, & Adolphs, 2011). In addition, in social and moral reasoning tasks, participants with autistic traits did not take situational cues into account to the same level as typically developing participants (Shulman, Guberman, Shiling, & Bauminger, 2012). Furthermore, compared to typically developing children, children with autistic traits performed poorer on tasks involving social inference, social attention skills, and the decoding of social cues, abilities which may be important for adapting behavior to situational demands (Dawson, et al., 2004; Jellema et al., 2009; Jing & Fang, 2014).

In contrast to individuals with social responsiveness problems, fearful or anxious children are found to be more strongly affected by situational factors (e.g. Gazelle, 2006). For example, anxious children who were confronted with hypothetical situations and were asked what their response would be, were more likely to change to more prosocial reactions after discussing the situation with their family as compared to their non-anxious peers (Shortt, Barrett, Dadds, & Fox, 2001). Further, fearfulness affects children's sensitivity to contextual factors, such as parenting. For example, fearfulness has been shown to moderate the impact of parenting on moral internalization and conscience development in children (Kochanska, 1997; Kochanska, Aksan, & Joy, 2007) and parenting style has been associated with problem behavior in fearful children, but not in their less fearful peers (Colder, Lochman, & Wells, 1997; Pitzer, Jennen-Steinmetz, Esser, Schmidt, & Laucht, 2011). Besides, the association between parenting and social skills in children has been found to be moderated by temperamental reactivity (including fearfulness) of the child (Smart & Sanson, 2001). Together,

these findings suggest that children with autistic traits might be less sensitive to differences in (social) situations, whereas anxious children might be more sensitive to them. However, whether these characteristics make children indeed more or less sensitive to situational features in a donating paradigm is still unknown.

In the current study, we tested whether a situational factor and/or dispositional factors were associated with the amount of money donated by 8-year-old children. Around the age of 8, most children have a well-developed concept of the value of money (Berti & Bombi, 1981) and the majority of children are able to estimate the value of money and know that not everyone has similar amounts of money to spend (Nibud, 2013). Children at kidergarten age were already able to indicate that more could be bought from a dollar than from coins with a lower monetary value (Brenner, 1998). Another study showed that 8-year old children (as well as older children) profited from education in economics (Sosin, Dick, & Reiser, 1997), implying that at this age children are capable of dealing with abstract concepts such as economy and money. All participating children were shown a video clip of a charity including a call for donation. We randomly manipulated the situational factor by showing half of the children a video in which a same sex peer donated money to the same charity, while the other half of the children did not see this probe. We hypothesized that the children who were shown the probe of the moral exemplar would donate more money than the children who did not get to see the probe. Further, we examined the associations between donating behavior and child characteristics inhibition and empathy. We expected that inhibition and empathy would not be associated with donating behavior over and above the effect of the situational manipulation. In addition, we examined whether children with social responsiveness problems (autistic traits) or with higher levels of anxiety were differentially affected by the situational manipulation. We expected for children with low levels of social responsiveness that they would be *less* affected by seeing a donating peer, and for children with high anxiety levels that they would be *more* affected by seeing this probe.

Methods

Setting

The current study is embedded within the Generation R Study, a population-based prospective cohort from early fetal life onwards in Rotterdam, the Netherlands (Jaddoe et al., 2012; Tiemeier et al., 2012). All mothers who had a delivery date between April 2002 and January 2006 and who resided in Rotterdam were invited to participate. At approximately 8 years of age, a subsample participated in a lab visit with detailed measures on neuropsychological and behavioral functioning. The study was approved by the Medical Ethical Committee of the Erasmus Medical Center, Rotterdam. Written informed consent was obtained from all adult participants and assent was obtained from children.

Participants

The project of which the current study was part of aimed to measure antisocial as well as prosocial behavior. To obtain large variation and avoid skewness in the distribution of the outcome variables, we preselected an aggressive, a prosocial, and a typical group, based on parent reports on the aggressive behavior scale of the Child Behavior Checklist 1½–5 (CBCL, Achenbach & Rescorla, 2000) and the prosocial scale of the Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997). Trajectories of aggressive behavior were distinguished for children of Dutch origin who had at least two CBCL aggression scores available at age 1.5, 3 and/or 6. A three-trajectory solution was selected as optimal, comprising a high, intermediate and low aggression trajectory (Wildeboer et al., 2015).

Children in the high aggression trajectory were eligible for the high aggressive group. Children in the lowest aggression trajectory who had a high prosocial score on the SDQ (14 or 15, range 5-15) were eligible for the high prosocial group. Children in either the low aggression trajectory with a prosocial score < 14 or in the intermediate aggression trajectory were considered eligible for the typical group. This resulted in a total sample of 291 children who were invited to take part in the current study. Of these, fifty-nine children and/or their parents refused to participate and did not visit the research center. In another 11 children, data on the donating task

was not reliable or not available, either because the child was still busy donating when the researcher entered the room (n = 4), due to technical difficulties (n = 4), misunderstanding of the task (n = 2) or because the parent did not allow a financial reward for the child (n = 1). This resulted in a final sample of 221 children who were eligible for the current study. For sample characteristics see **TABLE 3.1**.

TABLE 3.1
Sample Characteristics

Child characteristics	*M*(*SD*)/ No. (%)	Family characteristics	No. (%)
Gender, no. boys (%)	111 (50)	Education, no. (%) ≥ 1 parent higher education	188 (85)
Age donating task, *M*(*SD*)	8.59 (0.75)	Income, no. (%)	
No. donated €0.20 coins, *M*(*SD*)		€800-1,600	4 (2)
Without probe	6.97 (6.43)	€1,600-2,400	19 (9)
With probe	8.87 (7.12)	€2,400-3,200	42 (19)
Version, no. (%) without probe	115 (52)	€3,200-4,000	45 (20)
Trajectory group		€4,000-4,800	36 (16)
Prosocial, no. (%)	65 (29)	€4,800-5,600	26 (12)
Aggressive, no. (%)	73 (33)	>€5,600	49 (22)
Typical, no. (%)	83 (38)	Parity, no. (%) ≥ 1 sibling	193 (87)
Inhibition/WM, *M*(*SD*)	30.86 (3.77-3.78)		
Empathy, *M*(*SD*)	4.70 (0.93-1.02)		
Anxiety, *M*(*SD*)	1.65 (3.81-3.97)		
Social responsiveness prob., *M*(*SD*)	0.25 (0.26)		

N = 221.
Note. Reported values are untransformed, imputed data. *SD* is not available as pooled measure and therefore the range of *SD* over the five imputed datasets is reported.

Procedure

When the children were age 6, two consecutive questionnaires were sent to the parents. The first questionnaire measured anxiety as well as family income, educational level of the parents, and parity. The second questionnaire included questions on empathy and social responsiveness problems. Donating behavior and inhibition were measured at age 8 during a lab visit.

Measures

Donating behavior. Donating behavior was measured using an adapted version of the donating task by Van IJzendoorn et al. (2010). In the absence of their parent, children received 20 coins of 20 eurocents (€4.00) prior to the start of the task. The children were told that they received the money as

a reward for their participation in the previous tasks. Subsequently, they were asked to watch a short UNICEF movie about a girl in Bangladesh who had to work in a stone pit and therefore could not go to school. The movie was presented as a means to raise money to help the girl go to school. When the movie ended, the children were asked by a voice-over and by a text on the computer screen whether they wanted to donate money in the money box that stood in front of them. The moneybox contained several other coins in order to enhance credibility. For a random half of the children, a video-fragment followed that showed a probe of a same-sex peer in the same research setting donating 20 eurocent coins to the charity. After starting the film clip, the experimenter left the room. Children were thus alone while watching the movie. The experimenter returned 30 seconds after the movie had ended. The amount of donated money was counted by the experimenter after the session, in absence of the child. At the end of the study, the total amount of donated money was transferred to UNICEF.

Money donations were not normally distributed, instead a distribution with several peaks was found. Therefore we distinguished four categories: donated nothing (0 coins), donated less than half (1-9 coins), donated half or more than half (10-19 coins), donated everything (20 coins). The pattern of scores then approached a normal distribution (see supplementary **FIGURE S3.1**). Final analyses were also performed with the continuous variable, to check whether the results would diverge.

Inhibition. The Response Set task from the NEPSY-II-NL (Korkman, Kirk, & Kemp, 2010; White et al., 2013) was used to measure child inhibition. The NEPSY-II-NL is a Dutch translation of the North American NEPSY-II (Brooks, Sherman, & Strauss, 2010) and is suitable to assess neuropsychological functioning in 5-to-12 year old children. The subscale used to assess inhibition also measured working memory. A paper sheet containing red, yellow, blue, and black circles was laid in front of the children. Then, children listened to a recording with sequentially spoken color and non-color words at a set frequency. The children were told to respond to the word 'yellow' by tapping the red circle and to the word 'red' by tapping the yellow circle. When the children heard the word 'blue', they had to tap the blue circle. All other words and colors, including the word 'black' had to be ignored. Tapping the correct circle within two seconds indicated a correct response. Delayed responses and tapping the wrong circles were recorded as incorrect responses.

Empathy. Empathy was measured using a shortened subscale of the My Child Questionnaire (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994), a self-administered parent-report questionnaire on conscience development. Maternal reports on this questionnaire were positively associated with empathy/guilt responses of the child to moral dilemmas (Kochanska, Padavich, & Koenig, 1996) and negatively with observed rule transgressing behavior of the child (Kochanska et al., 1994). The questionnaire was shortened with approval of Kochanska (personal communication). The Empathy subscale consisted of seven items (e.g. '*My child will try to console or comfort somebody who is unhappy*') that were answered on a 7-point Likert scale ('*not applicable at all*' to '*fully applicable*'). The internal consistency of this subscale was acceptable, Cronbach's $\alpha = .67$ (in the complete data).

Anxiety. Anxiety was assessed using the Child Behavior Checklist/1½–5 (CBCL, Achenbach & Rescorla, 2000), a self-administered parent-report questionnaire including 99 items concerning emotional and behavioral problems of the child. Because the majority of children were younger than age 6 during the measurement of parent-reported anxiety, we chose to use the CBCL/1½–5. The Anxiety subscale consisted of eight items (e.g. '*Too fearful or anxious*') which could be rated on a 3 point scale (0 = '*not true*', 1 = '*somewhat true or sometimes true*', 2 = '*very true or often true*'). The subscale had an acceptable internal consistency, Cronbach's = $\alpha = .70$ (in the complete data).

Social responsiveness problems. To assess autistic traits, a shortened version of the Social Responsiveness Scale (SRS, Constantino, 2002; Román et al., 2013) was used for which parents reported on social responsiveness problems of their child in a naturalistic setting. The shortened scale comprised 18 items (e.g. '*Avoids eye contact, or has unusual eye contact*'). Questions could be answered on a 4-point scale ('*not true*' to '*almost always true*'). The current scale had good internal consistency, Cronbach's $\alpha = .82$ (in the complete data). SRS total scores show strong correlations with a diagnostic instrument for autism (Constantino et al., 2003).

Family characteristics. We also included several family characteristics (income, educational level of the parents, and parity), as these have previously been related to donating behavior (Van IJzendoorn et al., 2010; Van Lange, De Bruin, Otten, & Joireman, 1997; Verhaert & Van den Poel, 2011). Income was measured in categories, each comprising a range of €800 (see TABLE 1 for categories). Educational level of the parents was combined into

one dichotomous measure; when either one or both of the parents obtained higher education, the variable was coded as 'higher', when both parents completed secondary education or lower, the variable was coded as 'other'. Parity was dichotomized into 'none' and 'one or more siblings.'

Statistical analyses

To approach normality, skewed variables were transformed. Social responsiveness problems and anxiety were square root transformed because of moderate skewness. Inhibition and age of the child during the donating task were severely skewed and therefore a log10 transformation was applied (Tabachnik & Fidell, 2007). Missing data on the predictor variables ranged between 2 and 10% and were imputed using the multiple imputation method (Markov chain Monte Carlo) with five imputations and 10 iterations in SPSS 21. All statistics were pooled by SPSS, except for the standardized regression coefficient, standard deviation, R^2 and change in R^2, for which we provide the value range over the five imputed datasets.

First, correlations between all variables in the model were computed. Partial correlations were computed for the association between the amount of donated money and the other variables in the model, correcting for the version of the donating task (with or without the probe of a donating peer). Second, a hierarchical linear regression model was used to test the relation between the amount of donated money and the version of the donating task, family characteristics, and child characteristics. In the first step of this model, we tested the effect of the version of the donating task, correcting for age and gender of the child. In the second step, family characteristics were added. The third step comprised the inclusion of child characteristics and in the fourth step we tested interactions between the version of the donating task and the moderator variables anxiety and social responsiveness problems, and also inhibition and empathy. For this fourth step, interaction terms between the version of the donating task and the moderator variables were computed. Variables included in the interaction terms were centered. In case of significant interactions, we used stratified analyses on the version of the donating task, to further investigate the nature of the interaction effect. To visually explore the possible interaction effects, histograms were used.

Results

Non-response analysis

Children in the final sample ($N = 221$) did not differ from the non-participating children ($N = 70$) on gender, family income, educational level of the parents, parity, inhibition, empathy, anxiety, social responsiveness problems, or trajectory group (aggressive, typical, and prosocial group). Furthermore, these trajectory groups were not related to the amount of money donated (corrected for age, gender, and the version of the donating task, $F(2, 215) = 0.29$, $p = .752$).

Hierarchical linear regression

Nineteen percent of the children decided not to donate any money to the charity, 47% donated between 1 and 9 coins, 20% donated 10 to 19 coins, and 14% donated all of their money. Correlations and partial correlations between the variables included in the hierarchical linear regression model are reported in **TABLE 3.2**. **TABLE 3.3** summarizes the results of the hierarchical linear regression analysis to study the effect of situational and dispositional factors on donating behavior. In the first step we studied the situational effect of a moral exemplar on donating behavior, children who saw the probe donated more than children who did not see the probe ($B = 0.13$, 95% *CI* [0.01, 0.25], $\beta = .14$, $p = .035$). Gender and age were not predictive of the amount of money donated. In the second step, family characteristics were added to the previous model, but did not significantly increase the explained variance of the model. Educational level of the parents, parity, and income were not associated with the amount of donated money. In the third step, dispositional child characteristics were additionally included in the model to test whether these had an effect over and above the situational effect. Neither inhibition, empathy, anxiety, nor social responsiveness problems were associated with donating behavior, nor was there a significantly increase in explained variance. To test whether children differed in their sensitivity to situational demands, interactions between the version of the donating task and anxiety and social responsiveness problems were added to the model in the fourth step.This significantly increased the amount of explained variance (ΔR^2 (range) = .05-.08, $p < .01$). The interaction between the version of the donating task and anxiety was significant

TABLE 3.2

Correlations and Partial Correlations Between Variables in the Model

	1.[a]	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Donating behavior[a]													
2. Gender	.08												
3. Age	.14*	-.05											
4. Education parents	.02	-.04	.05										
5. Parity (0 or ≥ 1 siblings)	.06	.08	-.01	.19**									
6. Income	.14*	.11	.04	.37***	.18*								
7. Inhibition	.07	.06	.25**	.02	-.00	.16*							
8. Empathy	-.07	.14	.10	-.05	.00	-.03	-.15						
9. Anxiety	-.05	-.10	.08	-.02	.01	-.09	-.02	-.07					
10. Social responsiveness problems	-.10	.21**	.04	-.11	.01	-.09	-.06	-.18*	.36***				
11. Version*Inhibition	-.04	.01	.01	.09	-.01	.02	-.04	.07	.06	.05			
12. Version*Empathie	-.07	.01	-.08	-.03	-.11	.01	.07	.03	.00	-.01	-.14		
13. Version*Anxiety	.14*	-.06	.05	-.01	.08	-.07	.06	.00	.07	.05	-.01	-.07	
14. Version*Social responsiveness problems	-.13	.06	-.03	.10	.05	.02	.05	-.01	.05	-.11	-.05	-.18*	.36***

Note. Pearson and point-biseral correlations were used in case of two continuous or one continuous and one dichotomous variable, respectively. Phi coefficients were used for correlations between two dichotomous variables. Version = version of the donating task.

[a] Partial correlations corrected for the version of the donating task

* $p < .05$, ** $p < .01$, *** $p < .001$

TABLE 3.3
Hierarchical Regression Predicting Donating from Version of the Donating task, Family Characteristics and Child Characteristics

	B	95% CI	β (range)	*p*	R^2 (range)	ΔR^2 (range)
Step 1 - Situation and background					.05	.05*
Version of the donating task	0.13	[0.02, 0.25]	.14- .15	.027		
Gender	0.16	[-0.09, 0.41]	.07- .10	.214		
Age	3.31	[-0.08, 6.71]	.13- .14	.056		
Step 2 – Family characteristics					.06-.07	.02
Education father and mother	-0.09	[-0.47, 0.28]	-.02- -.05	.621		
Parity (0 or ≥ 1 siblings)	0.06	[-0.32, 0.44]	.01- .04	.750		
Income (categories[a])	0.08	[-0.00, 0.16]	.12- .16	.057		
Step 3 - Child characteristics					.08-.09	.02
Inhibition	-.02	[-0.49, 0.45]	.02- -.03	.921		
Empathy	-.11	[-0.24, 0.02]	-.11- -.13	.097		
Anxiety	-.01	[-0.16, 0.15]	-.02-.01	.927		
Social responsiveness problems	-.48	[-1.04, 0.08]	-.11- -.17	.089		
Step 4 - Interactions					.15-.17	.07-.08**
Version*Inhibition	-0.16	[-0.59, 0.27]	-.03- -.07	.473		
Version*Empathy	-0.09	[-0.23, 0.05]	-.06- -.12	.188		
Version*Anxiety	0.26	[0.11, 0.42]	.21- .26	.001		
Version*Social responsiveness prob.	-0.92	[-1.46, -0.38]	-.23- -.26	.001		

N = 221 * $p < .05$, ** $p < .01$
Note. For all variables the final (step 4) statistics are reported (except for R^2 and ΔR^2, for which the statistics specific to each step are reported).
[a] See Table 1 for income categories.

(*B* = 0.26, 95% *CI* [0.11, 0.42], β_{range} = .21-.26, p = .001), as was the interaction between the version of the donating task and social responsiveness problems (*B* = -0.92, 95% *CI* [-1.46, -0.38], β_{range} = -.23- -.26, p = .001). Interactions between version of the donating task and inhibition and empathy were not significant. Results of the hierarchical regression analysis remained similar in terms of significance when the original (continuous) donating variable was used as the outcome variable.

To further investigate the nature of the significant interaction effects, we conducted stratified analyses on the two versions of the donating task, including all variables (except the interaction terms) from the previous model. In children who did not see the probe, higher levels of anxiety were associated with smaller donations (*B* = -0.26, 95% *CI* [-0.48, -0.04], β_{range} = -.20 to -.29, p = .020), whereas in children who did see the probe higher levels of anxiety were associated with higher donations (*B* = 0.26, 95% *CI* [0.02, 0.50], β_{range} = .20 to .26, p = .037). Furthermore, in children who did not see

the probe, social responsiveness was not related to the amount of money donated (*B* = 0.50, 95% *CI* [-0.27, 1.19], β_{range} = .08 to .17, *p* = .217). However, in children who did see the probe lower levels of social responsiveness problems were associated with higher donations (*B* = -1.45, 95% *CI* [-2.35, -0.55], β_{range} = -.32 to -.40, *p* = .002). To visually explore the interaction effects, histograms were used. Because the data of anxiety remained slightly right skewed after transformation we divided the participants into two groups: one with low/medium levels of anxiety (bottom 75% and a group with relatively high levels of anxiety (top 25%), see **FIGURE 3.1**. The same was done for social responsiveness problems, see **FIGURE 3.2**. **FIGURE 3.1** illustrates that children in the upper quartile of anxiety problems donated more after seeing a probe, but donated less when not seeing this probe, as compared to their less anxious peers. **FIGURE 3.2** shows that when seeing the probe, donations were higher for children with less social responsiveness problems as compared to children with more social responsiveness problems, but that there was no difference in donations between the two groups in the no probe condition.

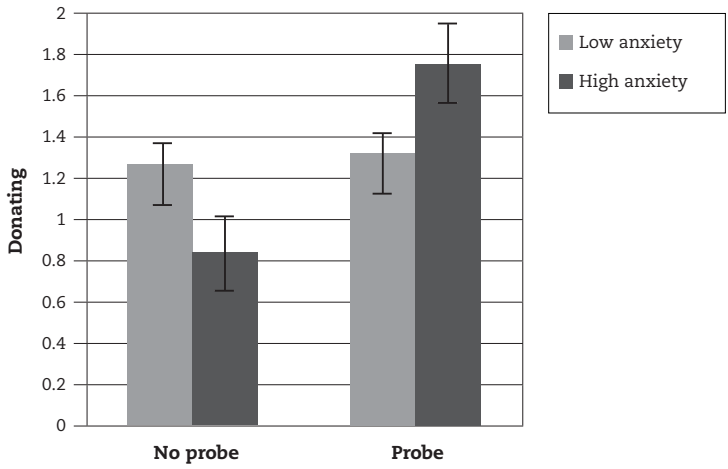

FIGURE 3.1
Mean levels of donating behavior in two groups: low anxiety (75% of the participants) and high anxiety (25% of the participants) per version of the donating task (with or without probe). The y-axis represents the recoded variable of donated money (range 0-3). Error bars are standard errors of the mean. The interaction between the version of the donating task (no probe vs. probe) and anxiety as a continuous measure was significant and is reported in Table 3 and in text.

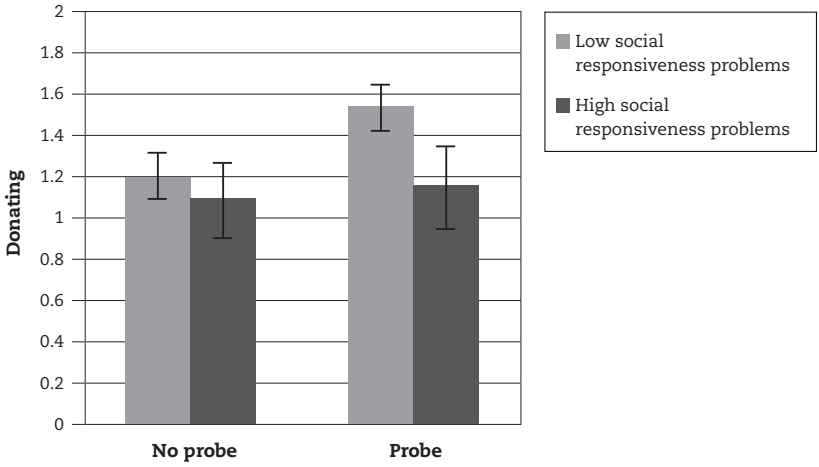

FIGURE 3.2
Mean levels of donating behavior in two groups: low social responsiveness problems (75% of the participants) and high social responsiveness problems (25% of the participants) per version of the donating task (with or without probe). The y-axis represents the recoded range of donated money (0-3). Error bars are standard errors of the mean. The interaction between the version of the donating task (no probe vs. probe) and social responsiveness problems as a continuous measure was significant and is reported in Table 3 and in text.

Discussion

While studies on distinct types of prosocial behavior often focus on either the dispositional or situational correlates of such behavior, the current study combined both factors and shows that not dispositional factors but situational demands affect donating behavior in middle childhood. However, the effect of the situation was not equal for all children. Depending on their levels of anxiety and social responsiveness problems, children were differentially affected by a situational manipulation. While children in general donated more after seeing a peer donate, this effect was particularly strong in anxious children and in children with low levels of social responsiveness problems.

Our study showed that children are willing to donate money to an unknown child in need. Whereas only a fifth of the children did not donate, the majority donated part or even all of their previously earned money. This corresponds to studies reporting that from a young age, children are motivated to help others, even when they do not receive a benefit and the person in need is a stranger (Warneken & Tomasello, 2006; 2008; 2009b).

However, the amount of money children were willing to donate differed across situations. Children who saw a peer donate money to the charity, donated on average two coins (29%) more compared to children who did not see this probe. This situational effect converges with results of earlier studies reporting that the height of donations is influenced by donations made by others (Freeman et al., 2009; Reyniers & Bhalla, 2013).

Modelling can provide individuals with an example on how to act in a (new) situation, can make people aware of a social norm, or can cause a state of moral elevation by showing moral virtuous behavior, which might underlie an increase in prosocial behavior such as donating (Bandura, 1977; Freeman et al., 2009; Kallgren et al., 2000). Peer pressure or reputational effects that predicted donating and helping behavior in previous studies (Engelmann et al., 2012; Reyniers & Bhalla, 2013) are less likely to have played a role in our case, as the peer in the video clip was a stranger and no one was present to observe the child.

The situational manipulation did not equally affect all participants. As hypothesized, children with high levels of anxiety seemed to be more influenced by a same sex peer who donated money. Anxious children who saw the probe donated more than their less anxious peers who saw the probe (an increase of 35%). Anxious children might be more eager to comply to the wishes of peers, out of fear that they otherwise might transgress a social rule or convention. For example, it is proposed that more fearful children might be more strongly motivated to adhere to a social norm, because they are more easily distressed by wrongdoing (Kochanska, 1993). Previous studies reported that anxious participants are more focused on social cues as compared to their non-anxious peers, and when more aroused, participants are found more willing to offer (financial) help (Pavey, Greitemeyer, & Sparks, 2012; Sposari & Rapee, 2007). Furthermore, anxious children and adolescents are more likely to adapt their behavior to peers and family than their less anxious peers (Cohen & Prinstein, 2006; Shortt, et al., 2001). Importantly, however, we also observed that more anxious children donated less compared to their less anxious peers when they did not see the probe. Anxious children might withdraw when confronted with new situations in which no example of how to act is provided. For instance, fearful toddlers are found to help less often when confronted with a distressed stranger as compared to their less fearful peers, possibly because they are over aroused (Liew et al., 2011). Furthermore, in a setting without the probe, anxious children may hold onto

the money for greater security as anxious people are more risk-avoiding (Maner et al., 2007), also in case of monetary risks (Gambetti & Giusberti, 2012).

More anxious children may be thus more open to the environment, for better *and* for worse, that is, they make higher donations when confronted with a moral example of donating, and smaller donations than their less anxious peers in the absence of such a model. This indicates that anxious participants may indeed be more affected by the situation, in line with differential susceptibility theory (Belsky et al., 2007). According to differential susceptibility theory, temperamental reactivity or temperamental fearfulness would make some children more open to environmental input, suggesting that they would do worse than their peers in bad environments but outperform them in optimal niches (Belsky, 1997; Bakermans-Kranenburg & Van IJzendoorn, 2015; Ellis, Boyce, Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2011). However, one caveat should be noted that made a real test of differential susceptibility not feasible. Anxiety was measured using the CBCL. The CBCL is a diagnostic instrument, aimed at identifying behavior problems, rather than individual differences in temperament. We therefore believe that CBCL scales are not fit as markers for differential susceptibility. Nevertheless, associations between temperamental fearfulness and behavior problems can be rather substantial, in particular at younger ages (Goldsmith & Lemery, 2000; Kagan, Snidman, Zentner, & Peterson, 1999; Leve, Kim, & Pears, 2005).

Children with varying levels of social responsiveness were also differentially affected by the situation. For children who did not see the probe, there was no association between social responsiveness and donating behavior. However, children who did see the probe made higher donations when they had lower levels of social responsiveness problems. This is consistent with studies reporting that the presence of others or a moral exemplar was related to higher donations in typically developing participants, but not in participants with autism (e.g. Engelmann et al., 2012; Freeman et al., 2009; Izuma et al., 2011). Previous studies report that both children and adults with autistic traits show deficits in the decoding of situational cues (Shulman et al., 2012; Jing & Fang, 2014). The results from the current study might therefore indicate that children with social responsiveness problems are less sensitive to (social) situational cues, and therefore do not increase their donation when provided with a moral exemplar.

The child characteristics inhibition and empathy were not related to the level of donating. Moreover, we did not find significant associations between trajectory group (aggressive, prosocial, typical) and donating. For each of these null findings substantive or measurement issues may have prevented us from finding significant relations. For example, the inhibition task we used might have had a ceiling effect in older children (e.g. Booth et al., 2003; Mous et al., 2016). However, the positive association between donating behavior and inhibition was also not replicated in a sample with a wider age range and different inhibition tasks (Liu et al., 2016). Furthermore, different types of prosocial behavior might have different roots (Paulus et al., 2013) and previous studies also showed that specific helping behaviors, including donating, might not have an underlying empathic motivation (Dunfield & Kuhlmeier, 2013; Eisenberg, Hofer, Sulik, & Liew, 2014; Van IJzendoorn et al., 2010; Warneken, 2015). However, other studies did find associations between empathy and donating behavior (e.g. Batson & Ahmad, 2001).

The most plausible interpretation of the absence of such an association in the current study might be found in the concept of situational morality, which implies that demand characteristics of the situation override individual differences in personality and individual morality (Van IJzendoorn et al., 2010). For example in adolescents, personal characteristics such as empathy were not associated with prosocial behaviors, whereas prosocial examples provided by parents and peers were (Lai, Siu, & Shek, 2015). One study did find an effect of empathy on donations to children in need, independent of situational influences (Sierksma, Thijs, & Verkuyten, 2014). However that study asked children for *imaginary* donations. Situational effects might have a less strong influence in such instances as it is probably easier to give away imaginary than real money and the effect of empathy might therefore not be overridden.

The current study adds to the perspective of situational morality that the power of the situation in shaping donating behavior is not the same for all children: less anxious and less socially responsive children are less affected by the presence or absence of the display of a donating peer. However, it is important to note that also in the group of children who did not watch a moral exemplar, donations to the charity were made, albeit in smaller amounts. The fact that children also donated when not being nudged leaves room for dispositional factors to be of direct influence on donating behavior.

A limitation of the current study concerns the implications of the results. Although our results show that the inclusion of a moral exemplar in fundraising video clips might have a beneficial effect on the amount of money raised, we do not know whether these results apply to real life situations. Furthermore, we made use of a videotaped peer, which is a digitalized context. This limits the generalizability to situations in which the moral exemplar is physically present. However, our set-up enabled us to standardize the situational manipulation. In addition, empathy, anxiety and social responsiveness problems were measured at the age of 5, whereas donating behavior was measured at 8 years of age. While this could have caused the lack of an association between empathy and donating behavior, empathy was found to be relatively stable over time (Davis & Franzoi, 1991; Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008). For anxiety and social responsiveness problems, the associations that were found might even be stronger when both dependent and independent variables would be measured concurrently. Lastly, several mechanisms might underlie the situational effect in the current study, and without specific tests of the modeling interpretation we cannot be certain what mechanism played a major role. And, of course, moderation of situational influences on prosocial donating behavior by level of anxiety and by social responsiveness problems should be replicated in independent studies to create a broader evidence base.

We suggest that situational factors might be more effective in shaping donating behavior than child characteristics such as inhibition and empathy. After watching a moral exemplar, children are willing to give a substantially larger amount of money to a charity. If our findings also hold true for adults, the higher donations observed in the current study after the display of the probe could provide important information to charities who would like to increase the height of donations, as such a manipulation is easily implemented in videotaped advertisements. Furthermore, these results suggest that at least certain forms of prosocial behavior are not (completely) dispositional traits, but are partly driven by situational demands. Nevertheless, dispositions such as anxiety and social responsiveness might moderate the situational impact on the child's behavior. In case of anxiety we speculate that differential susceptibility to the environment might play a role. In contrast, individuals with more autistic-like social responsiveness tendencies seem to remain indifferent for the social pressure of a child exemplifying prosocial donating.

References

Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for ASEBA Preschool Forms & Profiles*. Burlington: University of Vermont, Research Center for Children, Youth, & Families.

Aguilar-Pardo, D., Martínez-Arias, R., & Colmenares, F. (2013). The role of inhibition in young children's altruistic behavior. *Cognitive Processing, 14,* 301-307.

Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015). The hidden efficacy of interventions: Gene × environment experiments from a differential susceptibility perspective. *Annual Review of Psychology, 66,* 381-409.

Bandura (1977). *Social Learning Theory*. New York City: General Learning Press.

Batson, C. D., & Ahmad, N. (2001). Empathy-induced altruism in a prisoner's dilemma II: What if the target of empathy has defected? *European Journal of Social Psychology, 31*, 25-36.

Batson, C. D., Duncan, B. D., Ackerman, P., Buckley, T., & Birch, K. (1981). Is empathic emotion a source of altruistic motivation? *Journal of Personality and Social Psychology, 40*(2), 290-302.

Belsky, J. (1997). Variation in susceptibility to rearing influences: An evolutionary argument. *Psychological Inquiry, 8,* 182–186.

Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2007). For better *and* for worse. Differential susceptibility to environmental influences. *Current Directions in Psychological Science, 16*(6), 300-304.

Berti, A. E., & Bombi, A. S. (1981). The development of the concept of money and its value: A longitudinal study. *Child Development*, 52,1179-1182.

Booth, J. R., Burman, D. D., Meyer, J. R., Lei, Z., Trommer, B. L., Davenport, N. D., … Mesulam, M. M. (2003). Neural development of selective attention and response inhibition. *NeuroImage, 20,* 737-751.

Brenner, M. E. (1998). Meaning and money. *Educational Studies in Mathematics*, 36(2), 123-155

Brooks, B. L., Sherman, E. M. S., & Strauss, E. (2010). Test review: NEPSY-II: A developmental neuropsychological assessment, second edition. *Child Neuropsychology, 16*, 80-101.

Caprara, G. V., Barbaranelli, C., Pastorelli, C., Bandura, A., & Zimbardo, P. G. (2000). Prosocial foundations of children's academic achievement. *Psychological Science, 11*(4), 302-306.

Cohen, G. L., & Prinstein, M. J. (2006). Peer contagion of aggression and health risk behavior among adolescent males: An experimental investigation of effects on public conduct and private attitudes. *Child Development, 77*(4), 967-983.

Colder, C. R., Lochman, J. E., & Wells, K. C. (1997). The moderating effects of children's fear and activity level on relations between parenting practices and childhood symptomatology. *Journal of Abnormal Child Psychology,* 25(3), 251-263.

Constantino J. N. (2002). *Social Responsiveness Scale (SRS), Manual*. Los Angeles: Western Psychological Services.

Constantino, J. N., Davis, S. A., Todd, R. D., Schindler, M. K., Gross, M. M., Brophy, S. L., … Reich, W. (2003). Validation of a brief quantitative measure of autistic traits: Comparison of the Social Responsiveness Scale with the Autism Diagnostic Interview-Revised. *Journal of Autism and Developmental Disorders, 33*(4), 427-433.

Crick, N. R. (1996). The role of overt aggression, relational aggression, and prosocial behavior in the prediction of children's future social adjustment. *Child Development, 67*(5), 2317-2327.

Davis, M. H., & Franzoi, S. L. (1991). Stability and change in adolescent self-consciousness and empathy. *Journal of Research in Personality*, *25*(1), 70-87.

Dawson, G., Toth, K., Abbott, R., Osterling, J., Munson, J., Estes, A., & Liaw, J. (2004). Early social attention impairments in autism: Social orienting, joint attention, and attention to distress. *Developmental Psychology, 40*(2), 271-283.

Dunfield, K., & Kuhlmeier, V. A. (2013). Classifying prosocial behavior: Children's responses to instrumental need, emotional distress, and material desire. *Child Development, 84*(5), 1766-1776.

Dunfield, K., Kuhlmeier, V. A., O'Connell, L., & Kelley, E. (2011). Examining the diversity of prosocial behavior: Helping, sharing, and comforting in infancy. *Infancy, 16*(3), 227-247.

Eisenberg, N., Fabes, R. A., Karbon, M., Murphy, B. C., Wosinski, M., Polazzi, L., … & Juhnke, C. (1996). The relations of children's dispositional prosocial behavior to emotionality, regulation, and social functioning. *Child Development*, *67*(3), 974-992.

Eisenberg, N., Fabes, R. A., & Spinrad, T. L. (2007). Prosocial development. In W. Damon, R. M. Lerner, & N. Eisenberg (Eds.), *Handbook of Child Psychology.* Hoboken, NJ: John Wiley & Sons.

Eisenberg, N., Hofer, C., Sulik, M. J., & Liew, J. (2014). The development of prosocial moral reasoning and a prosocial orientation in young adulthood: Concurrent and longitudinal correlates. D*evelopmental Psychology*, 50(1), 58-70.

Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011). Differential susceptibility to the environment: A neurodevelopmental theory. *Development and Psychopathology*, 23, 7–28.

Engelmann, J. M., Herrmann, E., & Tomasello, M. (2012). Five-year olds, but not chimpanzees, attempt to manage their reputations. *PLoS ONE, 7*(10): e48433.

Freeman, D., Aquino, K., & McFerran, B. (2009). Overcoming beneficiary race as an impediment to charitable donations: Social dominance orientation, the experience of moral elevation, and donation behavior. *Personality and Social Psychology Bulletin, 35*(1), 72-84.

Gambetti, E., & Giusberti, F. (2012). The effect of anger and anxiety traits on investment decisions. *Journal of Economic Psychology*, *33*(6), 1059-1069.

Gazelle, H. (2006). Class climate moderates peer relations and emotional adjustment in children with an early history of anxious solitude: A child X environment model. *Developmental Psychology, 42*(6), 1179-1192.

Goldsmith, H. H., & Lemery, K. S. (2000). Linking temperamental fearfulness and anxiety symptoms: A behavior-genetic perspective. *Biological Psychiatry, 48*(12), 1199-1209.

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*(5), 581-586.

Haley, K. J., & Fessler, D. M. T. (2005). Nobody's watching? Subtle cues affect generosity in an anonymous economic game. *Evolution and Human Behavior, 26,* 245-256.

Izuma, K., Matsumoto, K., Camerer, C. F., & Adolphs, R. (2011). Insensitivity to social reputation in autism. *PNAS, 108*(42), 17302-17307.

Jaddoe, V. W. V., Van Duijn, C. M., Franco, O. H., Van der Heijden, A. J., Van IJzendoorn, M. H., De Jongste, J. C., . . . Hofman, A. (2012). The Generation R Study: Design and cohort update 2012. *European Journal of Epidemiology, 27*(9), 739–756.

Jellema, T., Lorteije, J., Van Rijn, S., Van 't Wout, M., De Haan, E., Van Engeland, H., & Kemner, C. (2009). Involuntary interpretation of social cues is compromised in autism spectrum disorders. *Autism Research, 2*, 192-204.

Jing, W., & Fang, J. (2014). Brief report: Do children with autism gather information from social contexts to aid their word learning? *Journal of Autism and Developmental Disorders, 44*(6), 1478-1482.

Kagan, J., Snidman, N., Zentner, M., & Peterson, E. (1999). Infant temperament and anxious symptoms in school age children. *Development & Psychopathology, 11*, 209–224.

Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin, 26*(8), 1002–1012.

Knafo, A., Zahn-Waxler, C., Van Hulle, C., Robinson, J. L., & Rhee, S. H. (2008). The developmental origins of a disposition toward empathy: Genetic and environmental contributions. *Emotion*, *8*(6), 737-752.

Kochanska, G. (1993). Toward a synthesis of parental socialization and child temperament in early development of conscience. *Child Development*, *64*(2), 325-347.

Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: rom toddlerhood to age 5. *Developmental Psychology, 33*(2), 228-240.

Kochanska, G., Aksan, N., & Joy, M. E. (2007). Children's fearfulness as a moderator of parenting in early socialization: Two longitudinal studies. *Developmental Psychology, 43*(1), 222-237.

Kochanska, G., DeVet, K., Goldman, M., Murray, K., & Putnam, S. P. (1994). Maternal reports of conscience development and temperament in young children. *Child Development, 65*(3), 852-868.

Kochanska, G., Padavich, D. L., & Koenig, A. L. (1996). Children's narratives about hypothetical moral dilemmas and objective measures of their conscience: Mutual relations and socialization antecedents. *Child Development*, *67*(4), 1420-1436.

Korkman, M., Kirk, U., & Kemp, S. (2010). *Technische Handleiding NEPSY-II-NL [Clinical and Interpretive Scoring Manual NEPSY-II-NL]*. Enschede: Ipskamp.

Krevans, J., & Gibbs, J. C. (1996). Parents' use of inductive discipline: Relations to children's empathy and prosocial behavior. *Child Development, 67*(6), 3263-3277.

Lai, F. H. Y., Siu, A. M. H., & Shek, D. T. L. (2015). Individual and social predictors of prosocial behavior among Chinese adolescents in Hong Kong. *Frontiers in Pediatrics, 3*, 1-8.

Leimgruber, K. L., Shaw, A., Santos, L. R., & Olson, K. R. (2012). Young children are more generous when others are aware of their actions. *PLoS ONE, 7*(10): e48292.

Leve, D. L., Kim, H. K., & Pears, K. C. (2005). Childhood temperament and family environment as predictors of internalizing and externalizing trajectories from age 5 to age 17. *Journal of Abnormal Child Psychology, 33*(5), 505-520.

Liew, J., Eisenberg, N., Spinrad, T. L., Eggum, N. D., Haugen, R. G., Kupfer, A., ... Baham, M. E. (2011). Physiological regulation and fearfulness as predictors of young children's empathy-related reactions. *Social Development*, *20*(1), 111-134.

Litvack-Miller, W., McDougall, D., & Romney, D. M. (1997). The structure of empathy during middle childhood and its relationship to prosocial behavior. *Genetic, Social, and General Psychology Monographs*, *123*(3), 303-325.

Liu, B., Huang, Z., Xu, G., Jin, Y., Chen, Y., Li, X., ... & Jing, J. (2016). Altruistic sharing behavior in children: Role of theory of mind and inhibitory control. *Journal of Experimental Child Psychology*, *141*, 222-228.

Maner, J. K., Richey, J. A., Cromer, K., Mallott, M., Lejuez, C. W., Joiner, T. E., & Schmidt, N. B. (2007). Dispositional anxiety and risk-avoidant decision-making. *Personality and Individual Differences*, *42*(4), 665-675.

Moore, C., Barresi, J., & Thompson, C. (1998). The cognitive basis of future-oriented prosocial behavior. *Social Development, 7*(2), 198-218.

Mous, S. E., Schoemaker, N. K., Blanken, L. M. E., Thijssen, S., Van der Ende, J., Polderman, T., ... White, T. (*in press*). The association of gender, age and intelligence with neuropsychological functioning in young typically developing children - The Generation R Study. *Applied Neuropsychology: Child*.

Nettle, D., Harper, Z., Kidson, A., Stone, R., Penton-Voak, I. S., & Bateson, M. (2013). The watching eyes effect in the Dictator Game: It's not how much you give, it's being seen to give something. *Evolution and Human Behavior, 34,* 35-40.

Nibud (2013). Nibud kinderonderzoek. Onderzoek naar basischoolkinderen en hun geldzaken.

Paulus, M., Kühn-Popp, N., Licata, M., Sodian, B., & Meinhardt, J. (2013). Neural correlates of prosocial behavior in infancy: Different neurophysiological mechanisms support the emergence of helping and comforting. *NeuroImage*, *66*, 522-530.

Paulus, M., Licata, M., Kristen, S., Thoermer, C., Woodward, A., & Sodian, B. (2015). Social understanding and self-regulation predict pre-schoolers' sharing with friends and disliked peers: A longitudinal study. *International Journal of Behavioral Development, 39*(1), 53-64.

Pavey, L., Greitemeyer, T., & Sparks, P. (2012). "I help because I want to, not because you tell me to". Empathy increases autonomously motivated helping. *Personality and Social Psychology Bulletin, 38*(5), 681-689.

Pears, K. C., Fisher, P. A., Bruce, J., Kim, H. K., & Yoerger, K. (2011). Early elementary school adjustment of maltreated children in foster care: The roles of inhibitory control and caregiver involvement. *Child Development, 81*(5), 1550-1564.

Pitzer, M., Jennen-Steinmetz, C., Esser, G., Schmidt, M. H., & Laucht, M. (2011). Differential susceptibility to environmental influences: The role of early temperament and parenting in the development of externalizing problems. *Comprehensive Psychiatry, 52*(6), 650-658.

Powell, K. L., Roberts, G., & Nettle, D. (2012). Eye images increase charitable donations: Evidence from an opportunistic field experiment in a supermarket. *Ethology, 118*, 1-6.

Pozzoli, T., & Gini, G. (2010). Active defending and passive bystanding behavior in bullying: The role of personal characteristics and perceived peer pressure. *Journal of Abnormal Child Psychology, 38*(6), 815-827.

Reyniers, D., & Bhalla, R. (2013). Reluctant altruism and peer pressure in charitable giving. *Judgment and Decision Making, 8*(1), 7-15.

Román, G. C., Ghassabian, A., Bongers -Schokking, J. J., Jaddoe, V. W., Hofman, A., Rijke, Y. B., ... Tiemeier, H. (2013). Association of gestational maternal hypothyroxinemia and increased autism risk. *Annals of Neurology*, *74*(5), 733-742.

Shortt, A. L., Barrett, P. M., Dadds, M. R., & Fox, T. L. (2001). The influence of family and experimental context on cognition in anxious children. *Journal of Abnormal Child Psychology, 29*(6), 585-596.

Shulman, C., Guberman, A., Shiling, N., & Bauminger, N. (2012). Moral and social reasoning in autism spectrum disorders. *Journal of Autism and Developmental Disorders, 42*, 1364-1376.

Sierksma, J., Thijs, J., & Verkuyten, M. (2014). Children's intergroup helping: The role of empathy and peer group norms. *Journal of Experimental Child Psychology, 126*, 369-383.

Smart, D., & Sanson, A. (2001). Children's social competence: The role of temperament and behaviour, and their "fit" with parents' expectations. *Family Matters*, 59, 10-15.

Sosin, K., Dick, J., & Reiser, M. L. (1997). Determinants of achievement of economics concepts by elementary school students. *The Journal of Economic Education*, *28*(2), 100-121.

Sposari, J. A., & Rapee, R. M. (2007). Attentional bias toward facial stimuli under conditions of social threat in socially phobic and nonclinical participants. *Cognitive Therapy and Research, 31*(1), 23-37.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (6th edition). Upper Saddle River, NJ: Pearson Education.

Tiemeier H., Velders F. P., Szekely E., Roza S. J., Dieleman G., Jaddoe V. W., ... Verhulst, F. C. (2012). The Generation R Study: A review of design, findings to date, and a study of the 5-HTTLPR by environmental interaction from fetal life onward. *Journal of the American Academy Child & Adolescent Psychiatry, 51*(11), 1119-1135.e7.

Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Pannebakker, F., & Out, D. (2010). In defence of situational morality: Genetic, dispositional and situational determinants of children's donating to charity. *Journal of Moral Education, 39*(1), 1-20.

Van Lange, P. A. M., De Bruin, E. M. N., Otten, W., & Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology, 73*(4), 733-746.

Verhaert, G. A., & Van den Poel, D. (2011). Empathy as added value in predicting donation behavior. *Journal of Business Research, 64,* 1288-1295.

Warneken, F. (2015). Precocious prosociality: Why do young children help? *Child Development Perspectives,* 9(1), 1-6.

Warneken, F., & Tomasello, M. (2006). Altruistic helping in human infants and young chimpanzees. *Science, 311,* 1301-1303.

Warneken, F., & Tomasello, M. (2008). Extrinsic rewards undermine altruistic tendencies in 20-month- olds. *Developmental Psychology,* 44(6), 1785-1788.

Warneken, F., & Tomasello, M. (2009a). Varieties of altruism in children and chimpanzees. *Trends in Cognitive Sciences,* 13(9), 397-402.

Warneken, F., & Tomasello, M. (2009b). The roots of human altruism. *British Journal of Psychology, 100*, 455-471.

Webb, D., & Wong, J. (2014). Exploring antecedents of charitable giving and their impact on subjective well-being in Singapore. *Social Indicators Research, 117,* 65-87.

White, T., El Marroun, H., Nijs, I., Schmidt, M., van der Lugt, A., Wielopolki, P. A., … Verhulst, F. C. (2013). Pediatric population-based neuroimaging and the Generation R Study: The intersection of developmental neuroscience and epidemiology. *European Journal of Epidemiology,* 28(1), 99-111.

Wildeboer, A., Thijssen, S., Van IJzendoorn, M. H., Van der Ende, J., Jaddoe, V. W. V., Verhulst, F. C., … Bakermans-Kranenburg, M. J. (2015). Early childhood aggression trajectories: Associations with teacher-reported problem behavior. *International Journal of Behavioral Development,* 39(3), 221-234.