Understanding Perspectives and Emotions in Contract Violation: Development of Deontic and Moral Reasoning

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Children between the ages of 3 and 10 years were presented with a set of pictures representing a contract with bilateral cheating options between a parent and child (Study 1) and between 2 peers (Study 2). The children had to (a) evaluate which situations violated the contract when the relevant information was presented, (b) anticipate the feelings of the violator and the victim, and (c) infer possible contract violation from 2 different perspectives when relevant information was covered. Results show that logical inferences about contract violation differ according to the type of task. Negative feelings attributed to the violator were dependent on age and type of relationship, revealing a content-sensitive codevelopment of cognitive abilities and moral reasoning in young children.

How do children come to understand contract violations and the emotions of violators and victims in such cases? We investigated this question by connecting two research fields that were previously unrelated. In cognitive research, reasoning about rules and contracts has been studied under the rubric of conditional reasoning with a focus on deontic rules of permission and obligation: What can or must logically be the case in a given set of circumstances? Mostly, this line of research has not been interested in developmental questions. In developmental research, on the other hand, the understanding of moral obligations has been studied in the tradition of the Kantian deontological ethics of what is obligatory in terms of moral principles. Moreover, the differentiation of moral rules from other types of social rules and the feelings connected with the violation of obligations have been investigated. The study of bilateral contracts has not been addressed in moral development research. We want to show that the study of contracts allows a fruitful connection of the two fields of research in which both cognitive and affective aspects can be studied in a developmental framework. In the following we briefly outline the research from the two fields that is relevant for this study.

Development of Deontic Reasoning

In contemporary cognitive psychology, the understanding of rules and contracts has been studied with methods created for research on conditional reasoning. Research has focused on the question of how people understand disconfirmatory cases or rule violations. Both abstract and social rules are defined as special cases of an “if p then q” relationship in which the presence of a certain rule (p) prescribes a certain condition or action (q). In the paradigmatic selection task (Wason & Johnson-Laird, 1968), which has been predominantly used in this research, a set of four cards is presented to a person. The visible side of each card represents one of the four logically possible states of a conditional rule, that is, p, not p, q, not q. The hidden underside contains information about either the antecedent (p or not p) or the consequent (q or not q) of the rule. The person is asked which of the four cards needs to be checked (turned over) to determine whether the rule “if p then q” has been violated. Research has shown that adults have difficulty in correctly inferring rule violation cases in abstract logical tasks but perform much more competently in tasks with social content (Evans, Newstead, & Byrne, 1993). In reasoning about bilateral contracts, adults are competent in switching between the different perspectives of the contractors to detect contract violations. For example, in the case of the contract “if working on the weekend, a worker gets a day off during the week,”...
respondents identified \( p \) and not \( q \) as possible violations from the worker’s perspective (working on the weekend and not getting a day off), and not \( p \) and \( q \) from the perspective of a factory owner (not working on the weekend and taking a day off; Gigerenzer & Hug, 1992; Politzer & Nguyen-Xuan, 1992). In general, it was easier for the respondents to detect the violation in the standard perspective referring to \( p \) and not \( q \) than in the switched perspective referring to not \( p \) and \( q \).

The findings have given rise to a set of explanations as to why people are more competent in understanding rule violations in social contexts. They range from the cognitive explanation of the availability of pragmatic reasoning schemas, such as permission and obligation schemes (Cheng & Holyoak, 1985) to the explanation that people are evolutionarily equipped with an algorithm for cheating detection. Cosmides and Tooby (1992) saw contractual arrangements as the basis of human (nonkin) cooperation where cheating is detrimental to the maintenance of mutually beneficial patterns of reciprocal exchange. A cheating-detection device protects against cheaters or free riders who exploit trust in relationships, that is, take a benefit without paying the required cost or being denied the benefit having paid the cost.

Deontic reasoning is a less well understood topic in the literature of children’s cognitive development. Because of the cognitive load of the selection task, researchers have designed various simplified versions of this task to explore the developmental origins of deontic reasoning. In studies, 70% of 7- to 10-year-old children were able to identify disconfirmatory cases of rules such as “all buzzing bees must stay in the hive” from pictures representing only the two possible outcomes, that is, being inside or outside the hive (\( q \), not \( q \) card; Girotto, Blaye, & Farioli, 1989; Light, Girotto, & Legrenzi, 1990). Cummins (1996) demonstrated that even 3- and 4-year-olds could identify violators of an authority rule such as “all squeaky mice must stay in the house” if the relevant information was presented in the pictures. Harris and Núñez (1996; Harris, 2000; Núñez & Harris, 1996) analyzed the understanding of the violation of parental commands in which a condition had to be fulfilled before a certain action was allowed, for example, that a protagonist had to wear a helmet if he or she went cycling. In this type of task preschool children were able to identify the rule-violation case from a set of four pictures representing the possible combinations of \( p \) and not \( p \) (cycling or not cycling), and \( q \) and not \( q \) (wearing or not wearing a helmet). Children could also distinguish between the relevant violation (what is forbidden, e.g., \( p \), not \( q \), cycling with no helmet) from the irrelevant condition (what is allowed, e.g., not \( p \), \( q \), not cycling but wearing a helmet). In contradistinction, in a study by Light, Blaye, Gilly, and Girotto (1989), older children could not distinguish between “must” and “may be” cases. They interpreted the rule that “all lorries have to be outside the center of town” as bidirectional, concluding that all other types of vehicles have to be inside the center (see Smith, 1993, for a discussion of the concept of logical necessity).

Concerning the question of violation detection in bilateral contracts, Janke (1999, in press) used the selection task format and cued 10-, 13-, and 15-year-olds into the different perspectives of the two contractors. The results revealed developmental and perspective differences. Across all three age groups, about 50% of the adolescents were correctly able to identify the standard condition (\( p \), not \( q \) in the switched perspective (not \( p \), \( q \)), the youngest age group gave only a few correct solutions whereas about 50% of the 13-year-olds performed correctly. Again, with a much easier evaluation task, Núñez (1999) demonstrated that children from the age of 3 years on could understand violations of bilateral contracts. Children were shown a set of four pictures representing the logically possible combinations of an agreement between two children to swap their toys. Of the youngest children, 80% correctly identified the picture of the “naughty” wrongdoer (one child holding both objects) and of the “good” child (having switched toys as agreed on). Overall, these results show that the understanding of rule or contract violations depends on how the task is presented to children, in particular, whether target information is visibly presented or has to be inferred.

**Development of Moral Reasoning**

The study of moral development focuses on moral norms and principles that define reciprocal obligations in terms of corresponding rights and duties. The focus of this research has been on the justification of moral rules and obligations (Kohlberg, 1976); on the distinction of moral rules from other types of rules, such as social conventions or authority rules (see Smetana, 1995, for an overview); and more recently, on the attribution of emotions in the case of moral rule violations (Arsenio & Lemerie, 2001; Keller, Lourêncio, Malti, & Saalbach, 2003; Nunner-Winkler & Sodian, 1988). In all of this research, bilateral contracts have not been an object of interest, but the concept of promise keeping has been (Keller, 1984; Keller & Edelstein, 1990; Kohlberg, 1976). As contracts can be seen as mutual promising (Fried, 1981), the obligation of promise keeping is a particularly good example to outline similarities and differences between research
on deontic reasoning and moral development. Through promises, people create legitimate expectations about each other’s actions (Searle, 1969). Each person has a right to expect the action agreed on, and each person is under an obligation to perform this action. The obligation to keep a promise can also be framed in cost–benefit terms (Richards, 1971) because accepting the benefits of the rule of promise keeping in general requires a person to pay the cost of keeping a promise, even if the person may not want to do so. Thus, accepting a benefit without paying the cost constitutes a moral violation.

Developmental research has demonstrated (Kohlberg, 1976; Youniss, 1980) that explicit cost–benefit calculations of a person constitute a developmentally early and restricted type of understanding of reciprocal obligations. According to Kohlberg (1976), children at the first stage of preconventional moral reasoning interpret the obligation to keep a promise as a unilateral authority rule in which one person (the authority) sets a rule and the other person (a child) has to obey. At the second stage, promise keeping is interpreted in terms of an instrumental tit-for-tat exchange, such that the moral rightness of promise keeping results from the expectation that the other will reciprocate by also keeping his or her promise when the situation occurs. At the third stage, promise keeping is seen to serve the function of establishing and maintaining trust between persons. The findings by Keller (1984, 1996; Keller, Eckensberger, & von Rosen, 1989; Keller & Edelstein, 1990, 1993) support the assumption of a developmental sequence of understanding promise keeping. But, consistent with other findings on moral reasoning in children (Eisenberg, 1986; Turiel, 1983), this research also documents that children have a genuine moral and empathic understanding that transcends obedience to authority and cost–benefit calculations. They evaluate promise keeping as right, independent of sanctions and instrumental considerations. They anticipate the psychological consequences of promise violation for the feelings of others (empathy) and for the self (moral feelings) as well as for the ongoing relationship. However, younger children do not understand moral rules such as promise keeping as strictly obligatory. Although they judge it as right to keep a promise, they frequently decide that a protagonist would break the promise because of subjective interests and goals (Blasi, 1984; Keller & Edelstein, 1990, 1993). The study of emotions in situations of violation of obligations has given further insight into children’s understanding of obligations and the consequences of violation of obligations.

In a series of studies on the happy victimizer phenomenon (Arsenio & Lover, 1995; Nunner-Winkler & Soda, 1988), feelings after moral violations have been studied from the different perspectives of victim and violator. It has been shown that for moral rule violations, such as stealing or physically hurting somebody, even young children anticipate the victim’s negative feelings but they attribute positive feelings to a violator. From about 6 or 7 years, however, children reveal a developmental shift in attributing negative or ambivalent feelings to the violator (Lourenço, 1997), or at least when imagining the self as violator (Keller, Edelstein, Fang, Hong, & Schuster, 1996; Keller et al., 2003). Understanding the negative feelings of a victim is a cognitively easier task than understanding the feelings of the violator because it requires assessment of the direct consequences of a violation for someone else affected by it. In contrast, the understanding of moral feelings of a violator depends on the establishment of a theory of mind and the ability to coordinate self–other perspectives (Harris, 1989), such as evaluating the consequences of an action in terms of a rule that forbids it. Concerning promise keeping, Keller (1984, 1996) has shown that children anticipate the negative feelings of a victim of a promise violation before they attribute moral (negative) feelings to the violator of the promise.

Whereas research on deontic reasoning has been more or less exclusively focused on cognitive aspects, more recently two studies have addressed the relationship between deontic reasoning and emotions. Both studies, however, were concerned with the feelings of the victim. Fiddick and Schultz (2000; Fiddick, 2003) were interested in different types of rule violations and found that adults anticipate anger as the emotional consequence of moral rule violation. Núñez (1999) showed that even children between 3 and 5 years of age attributed negative feelings to a victim in a situation of violation of reciprocal exchange between peers. The feelings of the violator have not been addressed in this context even though they are particularly interesting as a connection between deontic reasoning and moral development. Contractual arrangements constitute an important context in which rules of social exchange or cooperation and related feelings are experienced and learned. Reciprocity-based cooperation (Frank, 1988; Trivers, 1971) requires both the ability to detect cheaters and the ability to understand people’s moral emotions. It requires the ability to detect cheaters because altruists might get exploited (Axelrod, 1984; Tooby & Cosmides, 1992). Moral emotions such as
guilt and shame (but also anger) indicate that people are motivated to respect their contracts or promises. The philosopher Gibbard (1992) saw negative feelings of a victim—such as anger—and negative feelings in a violator—such as shame or guilt—as correlated feelings that arise in the event of a violation of reciprocity or cooperation. One might add sadness and disappointment as similar (i.e., negative) emotional reactions of the victim of a violation. Commitment problems can be solved by emotions only if the cooperators are able to understand others’ emotions. Thus, one can suggest that the capacity to take part in cooperative projects requires both the competence to detect cheaters (including deontic reasoning competence) and the competence to understand others’ moral emotions (anger, guilt, shame, etc.). These two competencies are constitutive components of our evolved competences to take part in cooperative endeavors.

The two studies presented here explore the relationship between the understanding of a contract violation and the anticipation of emotions in a contract in which both contractors can be violators and victim. Given the findings on the happy victimizer attribution, it seems that the understanding of feelings of victim and violator are not necessarily correlated in development. In addition to the developmental question, we are interested in the psychological conditions of the context that may influence both the understanding and the emotions attributed in a particular situation.

Study 1

In the first experiment we studied how children’s understanding of contract violation in a mother–child contract with bilateral violation options is connected with the anticipation of emotions from the different perspectives of victim and violator. This question is innovative in the field of deontic reasoning research because (a) bilateral contracts in a family context have not been studied in younger children and (b) the emotions of violators have not been addressed so far. From the perspective of moral development, the research is innovative because (a) bilateral contracts have not been a topic of research and (b) the emotions attributed to rule violators have not been studied in a context involving the different perspectives of the contractors. We chose a mother–child contract because we assumed that this presents a context that is relevant to the everyday experience of children where obligations are typically established, negotiated, and violated. This familiarity with the context should facilitate the understanding of the contract and the perspectives involved.

Concerning deontic reasoning, we assumed that preschool children could identify contract violations in a family context when the cognitive load of the task is reduced and the different perspectives of child and mother contractors are presented in the cognitively easy form of the evaluation task. In contrast, we expected developmental differences in the selection task, which has a high cognitive load, because target information is hidden and has to be inferred (see the Method section for description of the tasks). Furthermore, we expected that children would understand contract violation better from the perspective of the child protagonist, which in our task also represents the standard perspective (p, not q), compared with the perspective of the mother, which represents the switched perspective (not p, q). This effect should be present in both the evaluation and the selection task. Gender effects have usually not been of interest in deontic reasoning.

Concerning attribution of emotions, we expected that even younger children would understand that a victim of a contract violation feels bad and therefore would attribute negative feelings to both child and mother as victim. Concerning the feelings of the violator, we expected a developmental and a perspective effect: In general, with increasing age, children should more frequently attribute negative (moral) emotions to both child and mother as violator. However, the anticipation of moral feelings from the perspective of the child might be developmentally easier because children have more access to the experience of someone like themselves compared with the feelings of a parent. This difference might decrease with age when children can more easily switch between perspectives. Gender effects have not played a role in the attribution of emotions to transgressors (Arsenio & Lover, 1995; Nunner-Winkler & Sodian, 1988), but research on emotions has sometimes revealed that girls are more prone to guilt feelings (Kochanska, Gross, Lin, & Nichols, 2002). Therefore, in a family context girls might attribute moral (negative) feelings more frequently than boys.

For the relationship between deontic reasoning and emotion attribution, we assumed that it would be easier for children to identify correctly the two possible unilateral contract violations in the evaluation task than to attribute the morally adequate feelings to a violator. In contrast, because of the high cognitive load of the selection task, we expected that children would more frequently attribute the morally adequate negative feelings to a violator than correctly infer the contract violation cards in the selection task.
Method

Participants

We tested 122 children (58 girls, 64 boys) aged 3 to 10 years. Children were recruited from a kindergarten and an elementary school in former West Berlin. Participants came from middle- to upper-middle-class families in terms of economic status. About 90% of the participants were of German origin, and most of the remaining children had a Turkish background.

Participants were combined into three groups: preschool and kindergarten (21 girls, 19 boys; mean age = 5.3 years), Grades 1 and 2 (21 girls, 20 boys; mean age = 6.9 years), and Grades 3 and 4 (16 girls, 25 boys; mean age = 8.9 years).

Procedure

Children were interviewed individually, and answers were transcribed verbatim by the interviewer. The children were told a story in which the boy Maxi and his mother made a contract: “If Maxi keeps his room orderly for the next two weeks, then he will get a bike for Christmas” (see Appendix A). The cover story allows for contract violation from both sides: Mother had to leave town and therefore did not know how the room looked during her absence. On the other hand, it was not certain that she would be back in time to buy the bike.

Evaluation task: Understanding contract violation when relevant information is pictorially presented. Four cards represented the logically possible states: contract fulfillment (p, q: room clean and a bike), unilateral contract violation by Maxi (not p, q: room not clean but a bike) or Mother (p, not q: room clean but no bike), and contract violation from both sides (not p, not q: room not clean and no bike). Morally relevant are only the two unilateral violations, with either Maxi or Mother as violator or correspondingly as victim.

The four picture combinations were described as four different endings of the story. It was explained that the upper half of two pictures showed what Maxi’s room looked like (clean or not clean), and the lower part showed whether Maxi got a bike for Christmas or not (bike or no bike). The other two pictures showed in the upper part whether Maxi got a bike or not and in the lower part whether the room was clean or not clean. The children were asked to indicate for each card whether the agreement between Maxi and Mother was violated and to give a reason for their decision.

Attribution of feelings. For each of the four cards in the evaluation task, children were asked how Maxi and Mother felt and to give a reason for these feelings.

Selection task: Inferring contract violation from different perspectives. The task was introduced as a guessing game in which each of the four cards revealed only half of the contract information, with the other half not visible on the back. The front of two cards showed how the room looked (clean or not clean, p or not p), and the hidden back of each card contained the information on whether Maxi got a bike for Christmas or not (q or not q). The other two cards showed on the front whether Maxi got a bike for Christmas or not (q or not q), and the back contained the information on whether Maxi’s room was clean or not clean (p or not p). Each card was explained by indicating what was on the front and what might be on the back. The backs of the cards were not shown because in pretests, children, especially the youngest, had tried to memorize the back.

After the instructions the interviewer restated the agreement as well as the fact that both Mother and Maxi did not know what the other would really do. To make the guessing game ecologically valid, children had to take successively two different observer perspectives for checking possible unilateral contract violation. The order of the perspectives was counterbalanced.

Perspective of friend (checking for possible contract violation by Mother). Children were told that Maxi had a good friend who really wanted Maxi to get the bike because he knew that Maxi would let him ride it. Children were told: “Imagine you are Maxi’s friend and you are afraid that his mother did not arrive early enough to buy the bike so that the agreement might be broken.” Correct card selections from Friend’s perspective are p (room clean—did Maxi get a bike?) and not q (Maxi did not get a bike—is the room clean?).

Perspective of brother (checking for possible contract violation by Maxi). Children were told that Maxi had a brother who was jealous because he also wanted to have a bike. The children were told: “Imagine you are Maxi’s brother and you know that Maxi is sometimes naughty and that it has happened in the past that Maxi has not kept agreements. Therefore, you suspect that Maxi did not clean his room while mother was absent so that the agreement might be broken.” Correct card selections from Brother’s perspective are not p (room not clean—did Maxi get a bike?) and q (Maxi got a bike—is the room clean?).

Children were asked to select one or more of the four cards that might indicate contract violation and give reasons for the selection: “Which card do you have to turn over to know whether Mother/Maxi broke the agreement? Why do you have to check this
card? Is there another card you have to check? Why do you have to check this card?"

**Evaluation of Fairness of Outcome**

At the end of the interview children were allowed to turn each card and see the back. They were asked for each card whether the outcome was fair or unfair and to give reasons for their judgment.

**Results**

Hierarchical log-linear model procedures within SPSS-X/VMS (Statistical Package for the Social Sciences, 1990) were performed to test main and interaction effects of the independent and dependent variables. To estimate single parameters, log-linear models were computed. Only the two theoretically relevant unilateral contract violations were included in the statistical analyses. We started by fitting a hierarchical log-linear model that contained the theoretically expected interactions and the main effects covered by these interactions. Additionally, we checked in the saturated log-linear model, which included all variables, for statistically significant interactions that we had not predicted. The model fit ($\chi^2$) of the hier-log-linear model procedure with parameter estimations ($z$ values) is presented in the text. The reference category of each factor for the $z$ values is indicated by $r$. A model having a value greater than $p = .05$ is considered to be fitting. Furthermore, in a good-fitting model, $\chi^2$ and degrees of freedom should be of about equal size (Eye, von Kreppner, & Wessels, 1994).

Two scores were defined: Choice indicates which picture combination(s) children identified as contract violation. Justification indicates whether both elements of the contract violation were mentioned, that is, that the room was clean but Maxi had not gotten a bike ($p$, not $q$) or that the room was not clean but he had gotten a bike (not $p$, $q$). Reliability of choice was 100% agreement between two independent raters. Reliability of justification was 88% for two independent raters.

Only a few young children evaluated the $p$ and $q$ picture representing contract fulfillment as contract violation. However, more than 80% of the youngest group and about 70% of the two older groups evaluated the combination of not $p$ and not $q$ (room not clean, no bike), where both contractors failed, as contract violation (see Table 1). Analysis of the justifications revealed that about 50% of the children across all age groups interpreted Mother’s contract violation as the consequence of Maxi’s violation (“She did not give him a bike because the room was not clean”) and neglected the fact that Mother could not know whether Maxi had cleaned his room. In the following statistical analyses we focus on the two theoretically relevant unilateral violations.

**Correct choice of violation cards.** The first log-linear model included the factors: (a) choice of cards: not chosen ($r$), chosen; (b) type of violator: Mother ($r$), Maxi; and (c) grade: preschool, Grades 1 and 2 ($r$), Grades 3 and 4. We expected a significant Choice × Grade interaction and Choice × Type of Violator interaction, and a three-way of Choice ×

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<thead>
<tr>
<th>Kindergarten and preschool</th>
<th>First and second grades</th>
<th>Third and fourth grades</th>
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<tr>
<td></td>
<td>Girls</td>
<td>Boys</td>
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<td>Evaluation task</td>
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<tr>
<td>Room clean/bike ($p$, $q$)</td>
<td>14 (3)</td>
<td>16 (3)</td>
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<tr>
<td>Room not clean/bike (not $p$, $q$)</td>
<td>76 (16)</td>
<td>58 (11)</td>
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<tr>
<td>Room clean/no bike ($p$, not $q$)</td>
<td>57 (12)</td>
<td>68 (13)</td>
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<tr>
<td>Room not clean/no bike (not $p$, not $q$)</td>
<td>90 (19)</td>
<td>78 (15)</td>
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<tr>
<td>Selection task (correct card choices)</td>
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<tr>
<td>Perspective friend ($p$, not $q$)</td>
<td>0</td>
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<td>Perspective brother (not $p$, $q$)</td>
<td>10 (2)</td>
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<td>Negative feelings of violator</td>
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<td>Maxi</td>
<td>38 (8)</td>
<td>26 (5)</td>
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<td>Mother</td>
<td>19 (4)</td>
<td>56 (9)</td>
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**Note.** Absolute frequencies ($N$) are in parentheses.
Grade × Violator interaction. The predicted model produced a statistically significant fit of $\chi^2 = 17.03$, $df = 12$, $p = .15$. Log-linear analyses showed an age effect independent of type of violator. In general, the frequency of correct answers was high. But the middle and oldest group gave significantly more correct answers than the youngest group ($z = -2.47$ and $-2.33$, respectively), whereas the two older groups did not differ from each other (Table 1, Figure 1). Concerning perspective, more children correctly chose the picture with Maxi as violator than that with Mother as violator ($z = 2.91$). Furthermore, the saturated model revealed a statistically significant Choice × Sex interaction, which we had not predicted. Independent of age, girls gave more correct choices than did boys ($z = 2.15$). It may be because of this effect that the model fit of the theoretically predicted model is less good, as indicated by the imbalance between $\chi^2$ and degrees of freedom.

Correct justification of violation. We predicted the same Justification × Grade, Justification × Type of Violator, and Justification × Grade × Violator interactions as in the previous model. The model fit was $\chi^2 = 14.22$, $df = 12$, $p = .29$. With increasing age, children gave more correct justifications. Children from the middle and oldest groups gave significantly more correct justifications than children from the youngest group ($z = -3.29$ and $-4.35$, respectively), but there was no significant difference between the children from the middle and the oldest age groups (Figure 1). Contrary to our expectations, there was no effect of type of violator. The saturated model revealed no further statistically significant effects.

Relationship between choice and justification. McNe-mar tests revealed statistically significant differences ($p < .00$) in all three age groups and for both types of violator. Children performed better in choosing the correct card (intuitive judgment) than in giving an adequate reason for their choice (see Figure 1).

Attribution of Feelings in Evaluation Task

For statistical analyses, emotions were categorized as positive or negative. Positive emotions ($n$) included concepts such as good (199), happy and joyful (176), and other positive words (11). Negative emotions ($n$) were more varied and included not good or bad (199), sad (71), annoyed (58), mean (41), not happy or unhappy (30), surprised (36), stupid (23), afraid (18), unfair, bad conscience (8), strange (7), or other (36). All negative emotions were taken to indicate an awareness of the problematic aspect of the unilateral violation. Ambivalent (both positive and negative) feelings were mentioned infrequently and were scored as negative emotions. Interrater agreement concerning the coding of emotional attributions was 93% for two independent raters.

Feelings of victim. With few exceptions, victims were described as experiencing negative feelings. Therefore, we excluded this variable from further analyses.

Feelings of violator. The hilog-linear model included the variables of: (a) feeling: positive ($r$), negative; (b) type of violator: Maxi ($r$), Mother; (c) grade: preschool, Grades 1 and 2 ($r$), Grades 3 and 4; and (d) sex: boys ($r$), girls. We predicted the Feeling × Grade, Feeling × Type of Violator, Feeling × Sex interactions, and a three-way Feeling × Type of Violator × Sex interaction. The model fit was $\chi^2 = 12.81$, $df = 12$, $p = .38$. Log-linear analysis showed a statistically significant effect of age. Chil-
Children in the middle group did not differ from the youngest group but attributed negative feelings less frequently than the oldest children (z = 3.80; Table 1 and Figure 1). Although we had predicted a significant effect of type of violator, the direction of this effect was not as we expected. Children attributed negative feelings more frequently to Mother compared to Maxi as violator (z = 3.03). Neither sex of child nor the three-way interaction was statistically significant. The saturated model revealed no further significant effects.

Selection Task

Children had to infer possible contract violation from the two different perspectives of Friend and Brother, controlling for Mother’s or Maxi’s contract violation. Correct selection was scored when children selected for each perspective the two theoretically correct cards (p and not q, or not p and q). The preschool children were excluded from statistical analysis because they selected the two correct cards very infrequently (see Table 1).

Correct selection of violation cards. The log-linear model included the variables selection of: (a) both cards: not correct (r), correct, (b) perspective: Friend (r), Brother; and (c) grade: Grades 1 and 2 (r), Grades 3 and 4. We predicted that the Cards × Grade and Cards × Perspective interactions contributed significantly to the explanation of the data. The model fit, with $\chi^2 = 1.56$, df = 4, $p = .82$. Overall, the participants from the oldest age group chose the two relevant cards more frequently than did children from the middle age group (z = 2.55). Contrary to our expectations, no significant effect of perspective was obtained. The saturated model revealed an additional Cards × Sex interaction and a significant three-way Cards × Grade × Sex interaction. Girls gave more correct selections than did boys across all age groups (z = 2.95). Furthermore, this sex difference was greater in the oldest than in the middle age group (z = -2.57). The nonpredicted effects may explain why the predicted model did not have a good fit.

Correct justification of choices in the selection task. The justifications for each card selection revealed card-specific differences in children’s ability to take into account the covered information. As can be seen in Figure 2, participants from the middle and oldest age groups gave mostly correct justifications for the selection of cards p, q, and not q. Correct justification seemed to occur most frequently for the p card (room clean), where children correctly inferred that they must know whether Maxi got a bike. In contrast, in the selection of the not p card (room not clean), reasons focused predominantly on the visible information. Children concluded that the contract was violated because Maxi had not cleaned the room. Thus, they did not take into account that in this case the bilateral contract was violated only if Maxi had gotten a bike from the mother.

Evaluation task. We used McNemar tests to explore whether children performed equally well in understanding contract violation and in attributing negative feelings to a violator (Table 1 and Figure 1). No difference was found for Mother as violator ($p$, not $q$ card). Children who correctly indicated the violation also attributed negative feelings to Mother. In the case of Maxi as violator (not $p$, $q$ card), significantly more children indicated the unilateral violation correctly than attributed negative feelings to Maxi. For children who gave a correct justification for their choice, no systematic relationship between understanding and the attribution of negative feelings to the violator was found in the different age groups (see Figure 1).

Evaluation of Fairness

After turning each card, most children from the two older age groups (between 80% and 90%) judged contract fulfillment as fair and the two unilateral violations as unfair. For the preschool children, these frequencies were considerably lower. Furthermore, the older children evaluated Mother as violator more frequently as unfair (58%) than Maxi as violator (38%). Concerning violation from both contractors, most children from the older age groups judged the outcome as fair compared with only 23% of the youngest children.

Discussion

This study explored the development of deontic reasoning about a bilateral contract and the emotions involved in contract violations in a mother–child
In the family, bilateral contracts are frequently established, negotiated, and violated; therefore, children may experience the emotional consequences of a contract violation, especially when the interests of the self are violated. This experience should make it easier for younger children to understand and infer contract violation and anticipate the emotional consequences of such a violation.

**Understanding and Inferring of Contract Violations**

In the evaluation task in which the relevant contract information was presented, our results support the assumption of a less salient developmental effect: Even the youngest children were successful in identifying the unilateral contract violation of both the child and the mother, although they performed significantly less well than the two older groups. The lower frequencies in understanding cheating in the youngest children, as compared with the study by Núñez (1999), may have been found because the understanding of the bilateral contract violation in our study was cognitively more demanding: First, the actions of the contractors were delayed in time, and second, Núñez’s task (swapping toys) allowed the representation of each of the four logically possible combinations in one picture instead of a combination of two pictures, as in our task. Although children seem to have an intuitive understanding of the unilateral violations, they have difficulties in justifying violations correctly. Research in the Piagetian tradition has revealed similar differences between task performance and verbal explanation, including children’s conditional reasoning about syllogisms (Schröder & Edelstein, 1991). In our context we cannot fully exclude that a more elaborate
probing of the answers or a different type of contract might have reduced this salient effect.

Consistent with our expectations of a perspective effect, children were better at identifying contract violation when the child was the violator. This may be because children can more easily empathize with the contract violation by the child, whereas they may in general not expect a contract violation from a mother. Furthermore, the child violation constitutes the standard perspective \((p, \neg q)\), which in most cases has been shown to be easier to understand than the switched perspective \((\neg q, \neg p)\). Children interpreted the “not clean room” as a contract violation and did not take into account that the contract was broken only if Maxi had gotten a bike. This logical error may result from their everyday experience: Children normally have the task of cleaning their room—even if they do not get a reward for it. This interpretation is consistent with the fact that the majority of children from all age groups—and particularly the youngest children—judged the logically irrelevant condition \((\neg p, \neg q)\) as a contract violation from Maxi’s side: Mother did not give Maxi a bike because he had not cleaned the room. Thus, they did not consider the theory-of-mind aspect of the situation, where Mother could not know whether Maxi had fulfilled his side of the contract and therefore had to act on the belief that Maxi would clean his room as agreed on. From the moral point of view, however, children differentiated between contract violation from both sides, which they judged as fair, and unilateral violations, which they judged as unfair.

Concerning the selection task, our results show that the expected facilitation effect of context did not occur for the preschool children, who were not able to identify the two target cards correctly from the two different perspectives. The performance of the older groups is similar to the findings of Janke (1999, in press) and Overton, Ward, Noveck, Black, and O’Brien (1987), where about 40% to 50% of 10-year-olds correctly identified the standard perspective, but only 30% were able to solve the switched perspective. In our study we could replicate a similar effect of perspectives only in the evaluation task and not in the selection task. This may indicate that the content of the contract is of greater importance than previously thought.

In the selection task, more children were correctly able to identify one compared to the two logically correct cards. Consistent with the expected developmental effect, the youngest children gave fewer correct justifications than did the older children. Children from all three age groups, however, correctly selected the not \(p\) card (room not clean) in the switched perspective, but more frequently with wrong justifications: They again assumed that the contract was broken because Maxi had not cleaned his room, thus neglecting the outcome information of whether Maxi had gotten a bike. In the justification of all other card selections, children correctly referred to the hidden information on the back. This result shows that common-sense understanding can undermine logical inference. It is an open question whether rephrasing of the instructions to focus attention on both aspects of the contract might change this result.

The unexpected gender effect that girls both in the evaluation task and in the selection task performed better than boys is not easy to explain. Gender effects have not played a role in the research on deontic reasoning. The effect may therefore be due to the specific task or to a general developmental advancement of the girls in particular at the beginning of adolescence.

**Attribution of Feelings**

Our findings support previous results in the literature on moral rule violations (Arsenio & Lover, 1995) that children of all ages do understand the negative feelings of a victim of a contract violation. This holds true independent of whether the mother or the child is the victim. The use of undifferentiated concepts of good and bad is consistent with other literature on children’s moral judgments (Gibbs, Basinger, & Fuller, 1992; Keller, 1984). Harris (1989) showed that more complex feeling concepts emerge developmentally later. Contrary to our expectations, but consistent with previous findings in the happy victimizer tradition, girls did not anticipate more negative feelings than did boys.

The attribution of feelings to the violator revealed in all age groups the predominance of a happy victimizer attribution to the child violator who has achieved a desired goal and therefore is expected to have positive feelings. In contradistinction, the attribution of feelings to the mother as violator supports the assumption of a developmental shift in emotion attribution frequently reported in the literature (Arsenio & Lover, 1995; Nunner-Winkler & Sodian, 1988). One explanation for this finding may lie in the special relationship between mothers and their children. Children may have experienced in their own lives that mothers give them a benefit even though they have failed to fulfill an obligation. Such maternal inconsistency might be considered as moral luck by the child: to get something even though one has not deserved it. Mother’s act of giving Maxi a bike is interpreted as an act of caring and forgiving
that produces positive feelings in the child. It is exactly what children mostly expect from their mothers. Conversely, children evidently expect that the mother would feel bad if she had failed in the agreement. In the case of the mother’s feelings, children did not expect a happy victimizer viewpoint: Only a few children mentioned that Mother was happy because she did not buy a bike.

Relationship Between Understanding of Contract Violation and Feeling Attribution

Because of the context specificity in understanding violation and in the attribution of feelings to the violator, the relationship between the two variables is not consistent. Only in the case of Mother as violator did children who understood the violation correctly also attribute the adequate negative (moral) feeling more frequently. In the case of Maxi as violator, understanding the violation was advanced because the emotion attribution revealed no developmental effect. This situation-specificity of emotion attribution also influenced the relationship with the selection task. No difference was found between the attribution of negative feelings to Mother and the corresponding perspective in the selection task, whereas a difference was obtained for the emotions and the perspective of Maxi. We can conclude from this finding, more clearly than from previous research, that the attribution of feelings is not only dependent on developmental competence; rather, the relationship between cognitive and affective aspects is also dependent on the specific context of the situation. To come to a more conclusive result it is necessary to vary dimensions of the contract as well as of the relationship.

In a post hoc analysis of our contract situation, it is important to note that the two violation or cheating options were presented differently: as voluntary for the child (not cleaning the room during the mother’s absence) and (for ethical reasons) as nonvoluntary for the mother (she might not come back early enough to buy the bike). Thus, the mother’s contract violation was excused by unforeseen circumstances. From our findings, it seems that children were not fully aware of this intentional–accidental dimension. Intentions are an important factor that children can take into account in less complicated situations of deontic reasoning (Núñez & Harris, 1996). A study by Barrett (1999) showed that adults were much better in cheating detection when they suspected intentional cheating. Furthermore, the type of violation should be considered. According to the domain-specific theory of moral development by Turiel and his colleagues (Nucci, 2001; Smetana, 1995; Turiel, 1998) we have used a mixed-domain task involving a conventional obligation (cleaning one’s room) and moral obligations, such as a unilateral violation of a contract. To avoid this domain mixture, we explored a different contractual arrangement in a second study.

Study 2

The purpose of the second experiment was to explore a contract that avoided domain mixture and in which violations from both contractors are of equal impact. Furthermore, because it was not clear that children in the previous study had really understood the bilateral contract, some changes in the experimental procedure should improve children’s understanding, especially in the selection task.

We chose a contract in a peer relationship because it has been frequently discussed in the literature (Piaget, 1932/1965; Youniss & Damon, 1992) that peer relationships represent a context in which symmetrical reciprocal exchanges between persons of equal power are given. Moreover, friendship is particularly important for the development of understanding of moral obligations and responsibilities (Keller, 1984, 1996). Therefore, we can assume that compared to the parent–child context, friendship represents a more optimal condition for the understanding of bilateral contracts. We chose a contract involving the prosocial obligation of helping, which is an important topic in children’s friendships (Selman, 1980; Youniss, 1980). Although helping between friends in some situations is strictly obligatory, there are other situations in which it is not. In such situations, when (non-necessary) help is requested, a benefit may be offered for it. However, even in friendship children may violate such an agreement or have the experience of violation by a friend (Keller, 1984; Keller, Edelstein, Schmid, Fang, & Fang, 1998; Krappmann, 1989).

Núñez (1999) has shown that even preschool children understand bilateral agreements in a peer relationship. The task she used (swapping toys) is less cognitively demanding than the task in this study (see the Method section). The more complicated version of our task was necessary because it allowed us to assess the understanding of violation in both the evaluation and the selection task. From Núñez’s study, we know that children attribute negative feelings to the victim of a peer violation. However, the feelings of the violator—the main focus of our study—have not been addressed.

Concerning deontic reasoning, we expected that more children would solve the tasks correctly, in
particular, the cognitively more demanding selection task. In contrast to our previous findings, we expected no perspective effects in the evaluation task because both the contract and the violation were explicitly stated. In the selection task, however, we assumed that differences between the standard (p, not q) and the switched (not p, q) perspective would be maintained because these effects have been demonstrated in adolescents and adults.

Concerning attribution of emotions, we assumed that the perspective effect of the previous study was due to both the asymmetric type of relationship (parent–child) and the specific content of the contract that may have been interpreted as a rule of obedience. In a contract in a symmetrical and voluntary peer relationship, violations from both contractors may be morally equally severe. Thus, we expected that in the violation of a bilateral contract between friends, negative (moral) feelings would be attributed to both contractors as violators. Therefore, no effect of perspective or type of violator should be found. As in the previous study, however, we predicted a developmental effect and expected that girls might be more prone to attributing negative feelings to the violator.

We decided to interview the same children because the within-comparison design allowed us to minimize the possible influences of between-subject or between-study factors. The effect of practice can be seen as positive because it should help children gain familiarity with the complicated selection task. It seems implausible that the attribution of moral feelings could be reduced to such a practice effect.

Method

Participants

Of the previous 122 children, 90 (46 girls, 44 boys) were reinterviewed about 6 months later. For further statistical analyses, they were pooled into the same three age groups: kindergarten and preschool (8 girls, 8 boys; mean age = 6.00 years), Grades 1 and 2 (23 girls, 14 boys; mean age = 7.57 years), and Grades 3 and 4 (15 girls, 22 boys; mean age = 9.59 years). The high difference in number of the youngest children was mostly attributable to children changing to different schools.

Procedure

Children were interviewed individually and all answers were transcribed verbatim. They were told a story in which two friends made an agreement: “If Johannes helps Peter in the garden, Peter will let him ride his new bike” (see Appendix B). In contrast to the first study, we made explicit what was forbidden or what should not happen given the violation of the agreement: “But if Johannes does not help Peter in the garden, then he must not use Peter’s new bike.” Through this negation children should become sensitive to the relevant violation cases.

Again, there was a possibility for contract violation from both sides. Children were told that “Johannes really wants to ride Peter’s new bike but he does not really like helping in the garden. He is also not quite sure whether Peter will really let him ride the bike.”

Evaluation task: Understanding contract violation when relevant information is visible. Pictures of the four logically possible combinations of p and q were presented to the child (see Appendix B): contract fulfillment (p, q: help, bike), contract violation by either Johannes (not p, q: no help, bike) or Peter (p, not q: help, no bike), and contract violation from both sides (not p, not q: no help, no bike). The two unilateral violations (not p, q; p, not q) represent the theoretically relevant contract violations.

The four picture combinations were described as four different endings of the story. The procedure was slightly changed to facilitate understanding, in particular, in the selection task. This time, the left part of each picture showed whether Johannes was helping Peter in the garden and the right part showed whether Johannes rode the bike. The four cards were shown to the child sequentially in random order. For each card, the child was asked whether the agreement between Johannes and Peter had been violated and to give reasons for this judgment.

Attribution of feelings. Children were asked for the two unilateral violation pictures how Johannes and Peter felt in this situation and to give reasons for these feelings.

Selection task: Inferring contract violation from different perspectives. In contrast to the first study, in which information was hidden on the back of the card, this time one half of the picture combination was covered and presented as a window that could be opened later. This was intended to facilitate understanding. Children were told that the left part of the first two pictures showed whether Johannes helped Peter in the garden and the covered right part had the information on whether Johannes used or did not use the bike. For the other two cards, the right side showed whether Johannes used the bike or not and the covered left side contained the information on whether Johannes helped or did not help Peter. All four cards were explained individually by pointing out what happened in the visible part and what might be seen under the covered part.

After the instructions children were asked to retell the agreement and were told what was allowed and
what was not allowed. This information was repeated when necessary. In addition, the child was reminded of the possibility of contract violation from both sides. Again, children had to check for possible contract violations from two different observer perspectives.

**Perspective of Johannes’s brother (checking for contract violation by Peter).** The children were told that Johannes has a brother who is suspicious of Peter. They were told: “Imagine you are Johannes’s brother and you suspect that Peter is not keeping the agreement and does not let Johannes use the bike even though Johannes has helped him in the garden.” Correct card selections from the perspective of Johannes’s brother are p (Johannes helped—did he get the bike?) and not q (Johannes did not use the bike—had he helped?)

**Perspective of Peter’s brother (checking for contract violation by Johannes).** The children were told that Peter has a brother who is suspicious that Johannes is using the bike without helping Peter in the garden. They were told: “Imagine you are Peter’s brother and you suspect that Johannes is not keeping the agreement and is using the bike even though he has not helped.” Correct card selections from the perspective of Peter’s brother are not p (Johannes did not help—did he use the bike?) and q (Johannes used the bike—had he helped?)

The children were asked: “Which window do you have to open to know whether Peter/Johannes broke the deal? Why do you have to open this window? Is there another window you have to open? Why do you have to open this window?”

**Results**

As in Study 1, statistical analyses were performed according to theoretical predictions. Additionally, statistically significant effects in the first study were included in the predictions for the second study.

**Evaluation Task**

The variable choice indicates whether children pointed at the two correct picture combinations representing unilateral violation (p, not q, and not p, q). Justification is correct if a child states both elements of the contract violation, for example, that Johannes did not help and/or he used the bike. Interrater agreement for justifications between two independent raters was 89%.

Very few children judged the picture combination representing contract completion (help, bike) as a violation (see Table 2). Overall, 75% of the youngest age group (kindergarten and preschool) evaluated the “no help, no bike” condition as contract violation compared with only 51% and 22% in the two older age groups. Thus, the older children evaluated defection from both sides increasingly less as contract violation. Justifications of the older children were mostly adequate whereas the youngest children focused exclusively on the antecedent not p, that Johannes did not help. But they neglected the aspect that Johannes did not use the bike.

**Correct choice of violation cards.** The hilog-linear model included the factors: (a) choice of cards: not chosen (r), chosen; (b) type of violator: Peter (r), Johannes; (c) grade: preschool (r), Grades 1 and 2, Grades 3 and 4; and (d) sex: male (r), female. We predicted a Choice/C2 Grade interaction and, because of the findings from the first study, a Choice/C2 Sex interaction. This model revealed a statistically significant fit of $\chi^2 = 12.87, df = 8, p = .12$. However, no significant interaction effects were obtained in the

**Table 2**

<table>
<thead>
<tr>
<th>Kindergarten and preschool</th>
<th>First and second grades</th>
<th>Third and fourth grades</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Girls</td>
<td>Boys</td>
</tr>
<tr>
<td>Help/bike (p, q)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No help/bike (not p, q)</td>
<td>100 (8)</td>
<td>100 (8)</td>
</tr>
<tr>
<td>Help/no bike (p, not q)</td>
<td>100 (8)</td>
<td>88 (7)</td>
</tr>
<tr>
<td>No help/no bike (not p, not q)</td>
<td>100 (8)</td>
<td>63 (5)</td>
</tr>
<tr>
<td>Johannes’s brother (p, not q)</td>
<td>0</td>
<td>25 (2)</td>
</tr>
<tr>
<td>Peter’s brother (not p, q)</td>
<td>38 (3)</td>
<td>50 (4)</td>
</tr>
<tr>
<td>Negative feelings of violator</td>
<td>25 (4)</td>
<td>13 (2)</td>
</tr>
</tbody>
</table>

**Note.** Absolute frequencies (N) are in parentheses.
log-linear analyses (see Figure 3). The fit of the model can be attributed to the significant main effects of choice and grade ($z_s = 7.02$ and $2.62$, $ns$). Almost all participants chose the correct picture. The significant grade effect is theoretically irrelevant because it indicates that our sample was not balanced, specifically concerning the number of participants in the youngest age group. The saturated model revealed no further significant effects.

**Correct justification of violation cards.** We predicted a Justification × Grade interaction. The model fit, with $\chi^2 = 26.95$, $df = 20, p = .14$. Only the main effects of justification ($z = 7.86$) and grade ($z = -2.72$, $ns$) were statistically significant. The children chose the correct justification significantly more often than the incorrect justification. The significant main effect for grade can again be attributed to the imbalanced sample. In the saturated model we found a non-expected Justification × Grade × Sex interaction ($z = 2.06$, $ns$). Girls in the youngest age group performed significantly better than boys, but this difference did not exist in the older age group.

**Comparisons of Choice and Justification**

McNemar tests showed that across all age groups no difference was found between correct justifications and the correct choices of violation pictures. Thus, choosing the correct card was not easier for the children than choosing and giving the correct justification for their choices.

**Attribution of Feelings in Evaluation Task**

As in Study 1, emotional attributions were coded into the categories of positive and negative feelings. Interrater agreement concerning the coding of emotional attributions was 94% for two independent raters. Disagreements were resolved through discussion.

**Feelings of victim.** Almost all children attributed negative feelings to the victims of contract violation. Therefore, we excluded this variable from further analysis.

**Feelings of violator.** The log-linear model included the variables: (a) feelings: positive ($r$), negative; (b) grade: preschool, Grades 1 and 2 ($r$), Grades 3 and 4; and (c) sex: male ($r$), female. We predicted Feelings × Grade and Feelings × Sex interactions. This model did not fit the data. The saturated model showed that only the Feelings × Grade interaction was significant ($z = -3.42$, $ns$), indicating that the two older age groups attributed negative feelings more frequently to the violator than did the youngest age group, but the two older age groups did not differ. However, even in the two older age groups, about 35% of the children attributed positive feelings to the violator (see Figure 3 and Table 2).

**Selection Task**

Children had to infer possible contract violation from the different perspectives of the two brothers of the protagonists—controlling for Peter’s ($p$, not $q$ cards) or Johannes’ (not $p$, $q$ cards) possible contract violation. Correct selection was scored if the children identified the two correct cards for each perspective (see Table 2). Correct justification was scored for individual card selections if the children referred to the covered information of the chosen cards (Figure 4).

**Correct selection of violation cards.** The log-linear model included correct selection of: (a) both cards:
not correct (r), correct; (b) grade: preschool, Grades 1 and 2 (r), Grades 3 and 4; (c) perspective: Johannes’s brother (r), Peter’s brother; and (d) sex: male (r), female. We predicted Cards × Grade and Cards × Perspective interactions, and Cards × Sex and Selection × Grade × Sex interactions because they had turned out to be significant in the first study. The model fit, with $\chi^2 = 6.59$, $df = 13$, $p = .92$. Only the Cards × Grade interaction ($z = -3.24, \text{ ns}$) and Cards × Perspective interaction ($z = 2.73$) were statistically significant. Children from preschool chose the correct violation cards significantly less frequently than did children from the two older age groups, though children from the two older age groups did not differ. Moreover, from the perspective of Peter’s brother (Johannes did not help but used the bike; not $p$, $q$; switched perspective), participants made more correct selections than from the perspective of Johannes’s brother (see Table 2). Contrary to the findings of the first study, we found no interactions involving gender, which may be one cause for the lower model fit.

Correct justification of choices in the selection task. The justification for individual cards revealed no card-specific differences in the children’s ability to take into account the covered information (see Figure 4).
Figure 4). Only children in the youngest age group gave, with one exception, fewer correct justifications for their choices (about 20% difference).

Relationship Between Attribution of Feelings and Understanding of Contract Violation

**Evaluation task.** McNemar tests showed that for each age group and for each type of violator the children significantly more frequently correctly understood the violation pictures than they attributed the morally adequate negative feelings to the violators (see Figure 3).

**Selection task.** McNemar tests showed no differences between the frequencies of correct card selection in the selection task and correct attribution of feelings. This result held for each age group and for each type of violator.

Discussion

The second study investigated the development of deontic reasoning about a bilateral contract and the understanding of emotions in the case of contract violations in a peer relationship. Results of Study 1 indicated that children interpreted the agreement between mother and child in terms of their general everyday knowledge in a context of obedience in a unilateral or asymmetrical relationship. Contrary to our previous assumptions, this context might have prevented a clear understanding of the bilateral contract. A contract between peers should make it easier for children to understand a bilateral contract because of the symmetrical structure in this relationship (Keller, 1984; Krappmann, 1989; Selman, 1980; Youniss, 1980). In contrast to Study 1, the consequences of violating the agreement in terms of what was forbidden in the case of unilateral contract violation were also pointed out to the children.

**Understanding and Inferring Contract Violations**

The contract presented to the children required them to take into account the actions of the two peer contractors who could both violate the contract. Overall, children showed an increase in correct understanding across all tasks. This difference can be attributed to the combined effects of practice, variation in the experimental procedure, and the nature of the task.

In the evaluation task, the expected developmental and gender effects no longer appeared. Almost all participants from kindergarten to Grade 4, boys and girls equally, correctly chose the cards depicting a unilateral contract violation. Contrary to the findings of Study 1, no significant differences between correct choices and correct justification were obtained. Furthermore, as we had expected for the peer context, the two unilateral contract violations could be identified equally well. The irrelevant condition (not p, not q: no help, no bike) was across age increasingly less evaluated as a contract violation. This replicates the findings of Núñez (1999) that kindergarten children can identify violators of a bilateral contract between peers in a cognitively less demanding task, even though our task was more complicated than hers. However, our results also show that the youngest children have slightly more difficulty in adequately justifying their choices.

Compared with previous studies and our Study 1, children performed better in the selection task, and even some children from the youngest age group performed competently. This is interesting, even if we cannot disentangle whether this result can be attributed to a practice effect, the method, or the peer situation facilitating more correct answers than the parent–child situation. Contrary to previous research, with both adults and adolescents (Gigerenzer & Hug, 1992; Janke 1999, in press), the effect of perspective was reversed: The identification of the standard perspective target cards (p, not q: help, no bike) proved to be more difficult than the switched perspective cards (not p, q: no help, bike). This finding indicates that the content of the contract matters: Even in a bilateral contract between two (equally powerful) peers, children may interpret the agreement from their everyday experience. As research on the development of friendship reasoning has frequently shown (e.g., Bigelow & LaGaipa, 1975; Keller, 1996; Youniss, 1980), helping is considered a major characteristic in preadolescents’ friendship concept. Children might therefore consider not helping a friend in the garden but using the bike to be a more serious violation than helping and not getting the bike as a reward.

With the exception of the correct justification in the evaluation task in which girls performed better, no gender effects were obtained in Study 2. This finding can be interpreted by referring to our design: It might be possible that because of practice effects, the developmental advantage of girls diminished in Study 2. In general, gender effects have not been reported in the deontic reasoning literature.

**Attribution of Feelings**

The findings of Study 2 support previous research on moral development theory (Arsenio & Lover, 1995) and our expectations: Almost all children un-
understood the negative feelings of a victim of contract violation. For the feelings of the violator, however, the developmental effect remained salient in spite of a possible practice effect. Consistent with our expectations concerning the attribution of feelings to peer violators, the results of Study 2 revealed no perspective effect. For both types of violators, children from the middle and oldest groups significantly more frequently attributed negative (moral) feelings to the violator than did the youngest children. Thus, older children take into account the reciprocal obligations between the two contractors and therefore attribute negative feelings to both violators. However, the results do not fully support the idea of a developmental switch from positive to negative feelings, as postulated by Nunner-Winkler and Sodian (1988). Even in the two older age groups, between 30% and 40% attributed positive feelings to the violator in spite of their understanding that a contract violation had taken place. This finding is consistent with the results of Arsenio and Lover (1995), who also found a less dramatic developmental change. One explanation for this finding may be that some children do not judge this type of violation as serious. We discuss this finding more extensively in the General Discussion.

**Relationship Between Understanding of Violation and Emotion Attribution**

In Study 2 it was easier for children to identify correctly a unilateral contract violation than to attribute the morally correct negative feelings to the violators. Performance in the selection task and the attribution of moral feelings were equally difficult. Thus, in the context of a peer relationship in which both contractors are of equal power, the results for cognitive and affective variables are in the same direction and reveal a similar developmental trend.

**General Discussion**

The studies presented here have connected two previously unrelated research fields: deontic reasoning about rules and contracts in cognitive psychology, and moral understanding in the cognitive developmental tradition. We chose bilateral contract violations and the emotions elicited by these violations to demonstrate how these two lines of research can be fruitfully connected. In moral development research, the study of bilateral contracts has been neglected. In deontic reasoning research, on the other hand, the understanding of bilateral contracts has been mostly studied with adults, neglecting developmental factors. Furthermore, deontic reasoning research has been exclusively focused on cognitive processes. The relationship between the understanding of social rule violations and emotions has, with few exceptions, been neglected. The connection between these two research fields allows us to address interesting questions that have not been raised before.

Concerning deontic reasoning, the two studies show that even young children understand unilateral contract violations in parent and peer relationships in tasks that are cognitively less demanding than the selection task. The developmental component becomes stronger in the cognitively more complex selection task, even when the content of the contracts draws on children’s experiences. However, compared with the few studies that have been performed with children, our findings show that even first- and second-grade children solve the selection task remarkably well with methodological improvements and some practice. On the other hand, children’s correct justifications lag behind their judgments. Thus, full understanding of the selection task depends on higher order cognitive processes. This becomes clear even in the cognitively less demanding evaluation task, where children do not correctly understand the logically irrelevant condition. For the older children, the content of the task diminishes this error, but not so for the youngest children. In contrast to previous research with adults and children, our results also documented that the switched perspective can be easier than the standard perspective. Therefore, the content of the task is of greater importance than previously assumed.

The assumption of a cheating-detection device (Cosmides & Tooby, 1992) might explain the detection of contractual violations in the social world. However, developmental differences in the understanding of violations and the affective consequences of these violations within the social world of relationships are not taken into account in this framework. One conclusion that can be drawn from our results is that there seems to be no single process or general rule of reasoning that is applied to different contract situations. Rather, the understanding of contract violations and their affective consequences seems to be influenced by several factors, including the type of relationship, the a priori obligations that exist in these relationships, and the specific content of the contract. In contradistinction to economic contracts, which clearly specify costs and benefits, agreements in close relationships such as that of parent and child or between friends can be defined as quasi-contracts that are based on more or less specific a priori expecta-
tions. Children make sense of a particular contract in light of their general experiences and their knowledge of obligations in these relationships. Thus, not cleaning a room or not helping a friend is interpreted as a violation of an obligation even though—in terms of the contractual arrangement in our studies—it is only a violation if a benefit is accepted when the cost is not paid. Helping each other is a particularly important social practice and a mutually expected behavior in friendship, which is based on affection, mutual trust, and intimacy. This may be one reason why children are more sensitive to unilateral violations in friendship. For friendships, practices of reciprocity are constitutive, and serious moral violations may terminate the relationship. Moral feelings indicate an actor’s commitment to cooperation practices, and this is particularly important for the maintenance of voluntary relationships such as friendship, where the victim has to forgive the violator so that the relationship can be maintained. Parent–child relationships, on the other hand—as all kin relations—are maintained despite violations and are thus not as dependent on practices of reciprocity. The result that, also in the friendship context, a substantive number of older children attributed positive feelings to both violators may be explained by the fact that children may not evaluate such violations as serious moral transgressions that would terminate the relationship.

Our findings are also in line with some important distinctions that have been emphasized in moral development theory. Consistent with domain theory (Smetana, 1995; Turiel, 1998), we interpret the results of Study 1 in terms of a confusion between convention and morality that may have existed. Participants seemed to interpret the bilateral contract between parent and child in terms of a conventional authority rule of obedience. In Study 2, this confusion could be avoided by presenting the bilateral contract in a symmetrical peer relationship (Youniss & Damon, 1992). However, as we varied both the type of relationship and the type of contract, it remains open to future research to test experimentally the question of whether the same contract in different types of relationships is interpreted in the same way or to test systematically different types of violation of obligations. One further possibility might be to use a task that avoids the existence of a prior social conventional obligation, perhaps one in which contracts are made between adults and children over neutral issues. This would perhaps allow us to compare more readily the effect of peer or adult status on children’s reasoning about contracts.

The observational work of Dunn (1988) has given insight into how young children come to understand moral violations in their world of everyday social experiences. These experiences can be distinguished according to different types of role relationships, different types of rules or rule violations, and the consequences of such violations for self and others. The expectation of reciprocity in relationships is developed, in terms of what is allowed and not allowed and what is obligatory for the maintenance of relationships. In these relationships, children encounter or experience certain emotions through events in which expectations of trust and reciprocity are violated. Both parent–child and peer relationships are based on mutual trust and cannot be adequately described in terms of economic and instrumental exchange models. The concept of trust has recently received increasing attention in economics (Fukuyama, 1996). The work by Youniss (1980), Selman (1980), and Keller (1984, 1996) has traced the development of moral expectations in parent–child and peer relationships from childhood to adolescence. In this research it has been shown that sociomoral understanding varies developmentally with the content of the task and type of relationship. The findings from the two experiments presented in this paper support the conclusions from this research—that the understanding of violations of reciprocity and the emotions associated with these violations is transformed in the process of development.

Concerning the attribution of moral emotions to violators, our findings support both developmental effects and a more salient influence of context than previous research has shown. The more clear-cut developmental effect in the second study speaks against the assumption of a practice effect. Rather, this effect may be due to the content of the task. In the parent–child contract even the oldest children in our study attributed positive feelings to the child as rule violator. It would be interesting to know whether in the parent–child contract more elaborate questioning might have revealed an understanding of mixed feelings, as was the case in research by Lourenço (1997). Furthermore, Keller et al. (2003) have shown that children much more frequently attributed moral feelings when they were asked about how they themselves as transgressors would feel. Such a self–other differentiation has been frequently observed in the literature (Epley & Donning, 2000).

We believe that connecting deontic reasoning and moral developmental theory leads to interesting new questions and insights (see Fiddick, 2003). Findings in deontic reasoning research could be classified according to the framework of domain theory so that systematic differences between domains could be explored (Smetana, 1995; Turiel, 1998). Similarly, re-
search on the development of moral emotions could benefit from taking into account the interaction among domain, situation, and perspective in the exploration of social rules and bilateral contracts (Wiersma & Laupa, 2000).

Appendix A
1. Contract story: This is a story about Maxi, his family, and his friends. Here is what happens between Maxi and his mother. Christmas is approaching. Maxi really wants to have a good new bike. His mother says to him: You never really cleaned your room. Maxi knows that. Now, Maxi and his mother make an agreement:

   IF Maxi keeps his room tidy for the next two weeks, THEN he will get a bike for Christmas.

   Since they made this agreement, Maxi has always kept his room tidy. But then his mother has to go on a trip for two weeks. So, his mother cannot know what Maxi’s room looks like during the time she is away. And Maxi does not know whether his mother will come back in time to buy the bike for Christmas (see Figure A1).
Appendix B

1. Contract story: This is Johannes and this is his friend Peter. Peter just got a new bike. Johannes really wants to ride the bike. Therefore, Johannes and his friend Peter make an agreement:

   *IF* Johannes helps his friend Peter in the garden, *THEN* he can ride Peter’s new bike. But *IF* Johannes doesn’t help him in the garden, *THEN* he must not ride the bike.

Johannes really wants to use Peter’s new bike. But on the other hand, he doesn’t like working in the garden and he is not sure whether Peter will really let him use the bike. But he could just take the bike because he knows where Peter keeps it (see Figure B1).

References


(Eds.), *Morality in everyday life* (pp. 87–128). New York: Cambridge University Press.


