Restorative Justice in Children

Highlights

- 3- and 5-year-old children moved objects into an inaccessible cave
- They did so as often when another individual was affected as for themselves
- They intervened less when taking was permitted than for theft, unfairness, and loss
- 3-year-olds preferred to return displaced objects to the original owner

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In Brief
Riedl et al. show that children as young as 3 years of age intervene on behalf of victims as much as they do for themselves. The authors suggest that at an early age, children have a sense of restorative justice centered on the welfare of harmed individuals, with implications for the emergence of third-party punishment.
Restorative Justice in Children

Katrin Riedl, Keith Jensen, Josep Call, and Michael Tomasello

An important, and perhaps uniquely human, mechanism for maintaining cooperation against free riders is third-party punishment [1, 2]. Our closest living relatives, chimpanzees, will not punish third parties even though they will do so when personally affected [3]. Until recently, little attention has been paid to how punishment and a sense of justice develop in children. Children respond to norm violations [4]. They are more likely to share with a puppet that helped harmfully, and they show a preference for seeing a harmful doll rather than a victim punished [5]. By 6 years of age, children will pay a cost to punish fictional and real peers [6–8], and the threat of punishment will lead preschoolers to behave more generously [9]. However, little is known about what motivates a sense of justice in children. We gave 3- and 5-year-old children—the youngest ages yet tested—the opportunity to remove items and prevent a puppet from gaining a reward for second- and third-party violations (experiment 1), and we gave 3-year-olds the opportunity to restore items (experiment 2). Children were as likely to engage in third-party interventions as they were when personally affected, yet they did not discriminate among the different sources of harm for the victim. When given a range of options, 3-year-olds chose restoration over removal. It appears that a sense of justice centered on harm caused to victims emerges early in childhood and highlights the value of third-party interventions for human cooperation.

RESULTS

To explore the emergence and early development of third-party interventions in the context of distributive justice, we tested 3- and 5-year-old children using an action-based paradigm that had been applied to chimpanzees [3]. The question was whether children would selectively “punish” another individual (namely as negative reciprocity or to impose a cost to decrease future occurrences of a behavior [10, 11]) and whether they would do so on behalf of others. Inflicting costs on others need not always be punitive: adults and children will even suffer a cost themselves to reduce another’s welfare out of a sense of fairness and even spite [12–16]. We contrasted intentional harm (theft) as a measure of punishment, with unfair outcomes (spitefulness), loss (frustration), and permitted taking (impulsive pulling). Based on previous studies, even young infants have expectations when observing reward distributions [17] and will act on these [18]. Infants will also show preferences for helpful as opposed to harmful figures [19] unless the harm is warranted [20]. In addition to allowing children to respond (i.e., pull a rope causing the table to turn) in second-party conditions and intervene in third-party conditions (experiment 1), we also allowed the 3-year-olds to give and remove rewards freely (experiment 2). We predicted that children would respond less often as the violation diminished, namely more often in response to theft than to the other violations, more often to unfairness than to loss and permitted taking, and more often to loss than permitted taking, and that they would do so more often when personally affected than when witnessing a violation.

In both experiments 1 and 2, children were tested with a large turntable and puppet characters (Figure S1). The turntable was divided into quarters that demarcated the child’s position, the position of the “victim” (to the child’s left), the position of the “thief” (across from the child), and an inaccessible area called the “cave” (to the child’s right). Puppets played the roles of victim and thief as well as “stranger.” The table could be turned by pulling ropes underneath it. These were only in the child’s position and the thief’s position; the purpose of this was to make it clear to the child that the puppet in the victim’s position could not turn the table. In experiment 1, the child had a single rope, allowing the table to be turned clockwise only; once pulled to the cave position, the apparatus was locked, preventing further movement. Children and puppets would play with toys or eat cookies that would be present on only one quadrant of the table. Children were assigned to one of four between-subject treatments (theft, unfairness, loss, and permitted taking) according to how the objects were taken and who benefited, and they participated in both third- and second-party within-subject conditions (three trials of each, order counterbalanced between subjects). Figure 1 presents a schematic diagram of the different treatments and conditions.

In experiment 1, 3- and 5-year-old children could intervene when witnessing a third individual similarly affected, and they could also respond when personally affected. The children either witnessed goods being taken away from a puppet (third party [3P]) or had the goods taken away from them (second party [2P]); there was no effect of the order in which the conditions...
were presented (3-year-olds $p = 0.973$; 5-year-olds $p = 0.628$). The only action available to the children was to move objects on the table away from the thief’s position to the cave. Both 3- and 5-year-olds turned the table as often into the cave in 3P as in 2P (3-year-olds $T^+ = 40, n = 48$ (34 ties), $p = 0.448$; 5-year-olds $T^+ = 68, n = 72$ (58 ties), $p = 0.319$; Figure 2). There was no difference between the paired conditions including 2P theft and 3P theft (3-year-olds and 5-year-olds, $p > 0.25$; Table S1). We then examined the between-subject treatments for the two conditions separately (e.g., 2P theft versus 2P permitted taking). When children were directly affected by the actions of puppets (2P), 5-year-olds tended to put objects into the cave more often in the theft treatment than in the permitted-taking treatment ($p < 0.001$), and 3-year-olds tended to put objects into the cave more often in 2P theft than 2P permitted taking ($p = 0.089$; Table S2). Furthermore, 5-year-olds ($p = 0.041$), but not 3-year-olds ($p = 0.162$), moved objects into the cave more often in response to 2P theft than 2P loss. Both 3-year-olds ($p = 0.005$) and 5-year-olds ($p = 0.015$) were significantly more likely to respond to 3P theft than 3P permitted taking, and both groups of children would make objects inaccessible when another individual lost them, even when the puppet who benefitted was not responsible for taking them (3P unfair, $p > 0.475$) or if no one else received them at all (3P loss, $p > 0.723$). In other words, the children moved objects in the unfair, loss, and theft treatments and would do so as much for the sake of the victim as for themselves. The fact that they were as likely to intervene when witnessing another individual’s loss—regardless of the cause—suggests that they focused on the consequences for the victim rather than on the benefits or intentions of the thief (when present). Additionally, they protested and tattled in all of the treatments, not solely in response to theft or just when personally affected (see Supplemental Information).

Figure 1. The Four Between-Subject Treatments Were Theft, Unfair, Loss, and Permitted Taking, and the Within-Subject Conditions Were 2P and 3P
(A–D) Illustration of theft (A), unfair (B), loss (C), and permitted-taking (D) treatments for second-party (2P) and third-party (3P) conditions. The starting positions of the objects on the turntable (either in front of the child or puppet 1 in the victim’s position) are shown. The arrows show the movement of the turntable caused by puppet 2 in the thief’s position (solid lines) or the stranger puppet 3 (dashed lines). The dot at the beginning of the arrow in the permitted-taking treatments indicates that the puppet or child allowed the objects to be moved away. See also Figure S1.
In experiment 2, we wanted to determine whether children would prefer to restore items by returning them to the original possessor or intervene by making them inaccessible. As in experiment 1, 3-year-old children and a puppet had items taken away from them; the key difference was that children had access to two rope ends, allowing them to turn the table freely in either direction. In addition to allowing the children to move objects into the cave, they could take the objects for themselves or move them to the victim’s position. There was again no effect of order for 2P and 3P ($p = 0.433$). Children were more likely to pull objects away from the thief position in the second-party conditions than in the third-party conditions (69% and 58%, respectively; $T^* = 43.50, n = 48$ (29 ties), $p = 0.031$), but the only difference was a trend for children to turn the table more in 2P theft than 3P theft ($p = 0.063$; all other $p > 0.10$; Figure 3; Table S3). Across 2P treatments, they were more likely to turn the table when the thief took the objects away from them than when they consented to having them taken (2P theft versus 2P permitted taking; $p = 0.014$; Table S4). There was no difference, however, between 3P theft and 3P permitted taking or any of the other treatments (all $p > 0.10$). The predominant response was to return the objects to the original owner, though they were more likely to do this for themselves in the 2P trials than for the victim in the 3P trials ($T^* = 47.00, n = 48$ (25 ties), $p = 0.004$). They restored the objects more often when personally affected by theft than when a third party was affected ($p = 0.016$), and they showed a tendency to do so when consent was given (2P permitted taking versus 3P permitted taking; $p = 0.094$; Table S5). There was no difference in restoration between 2P unfair and 3P unfair or between 2P loss and 3P loss (all $p > 0.5$). It is worth noting that stealing (pulling to self) was uncommon in all but the permitted-taking treatment: this occurred only three times in 3P theft, twice in 3P unfair, and seven times in 3P permitted taking. Children predominantly chose the “self” option in the 3P permitted-taking treatment; this was the only situation in which objects were not restored to the original owners. Removal—moving the object into the cave where no one could get the goods—was the most infrequent choice, occurring only twice in the 2P condition and only once in the 3P condition. As in experiment 1, the children protested and tattled across treatments in 3P as well as in 2P (see Supplemental Information).

Three-year-old children pulled the rope causing the table to turn at a very high rate in all treatments with the exception of the permitted-taking treatment. They were far more likely to return items to the original owner—either themselves (2P) or the victim puppet (3P)—than they were to do nothing, make the items inaccessible, give them away, or steal them for themselves. The children were more likely to return things to themselves in 2P than in 3P, but they still reacted at a surprisingly high rate when they were not directly affected. The only group of children that did not turn the table as often as the others were those in the permitted-taking treatment, namely when the puppet in the victim’s position or the child gave permission to the third puppet to take the objects away. The children in this study appeared to focus on how the outcomes affected the original owners and less, perhaps, on the consequences for the puppet who only secondarily received them.

**DISCUSSION**

The first experiment demonstrated that both 3- and 5-year-old children will intervene against third-party violations, and they will do so as much as when personally affected. Three-year-olds did not appear to punish theft, in that they were as likely
Whether children use these interventions as demonstrations of third-party interventions in young children and victims cued the children to act, just as expressions of distress because the victim had no recourse for action; only the child our studies, children intervened when the victim was present.

Taking, namely responding to the distress of the victims understanding (theory of mind [23]). The third-party responses of they demonstrate perspective taking on the basis of false belief in unfairness, and, as in experiment 1, they did not discriminate among theft, unfairness, and loss.

At the preschool age, children do not appear to inflict harm on others out of a sense of justice based on deterrence or revenge (e.g., [22]) but out of a concern for the welfare of the victim. This is especially striking in that they do so as much for another individual as for themselves, even before the milestone age at which they demonstrate perspective taking on the basis of false belief understanding (theory of mind [23]). The third-party responses of the children are likely due to a combination of affective perspective taking, namely responding to the distress of the victims [24, 25], and an already established norm of ownership [26]. In our studies, children intervened when the victim was present because the victim had no recourse for action; only the child was in the position to act. It is possible that the protests of the victims cued the children to act, just as expressions of distress elicit looks of concern [25].

The two studies presented here are the clearest (and earliest) demonstrations of third-party interventions in young children and the first to attempt to disentangle punishment from other third-party motivations. Whether children use these interventions as
deterrence or as a form of just deserts is a question that requires further work. At least by the age of seven, children do respond to the threat of punishment by behaving more cooperatively [3], and they will even pay a cost to impose a cost on a norm violator (K.R. et al., 2011, Soc. Res. Child Dev., conference presentation). As well, it would be important to address the role of signaling on part of the victim; children of the age of 18 months will show concern for others even in the absence of emotional cues [24], but requests at this age are important for eliciting sharing [27]. Furthermore, children might signal their role as enforcers [21].

To determine whether concern for victims motivates punishment is a universal part of a child’s development, future studies could examine children in other cultures, since adults in different societies show patterns of third-party and altruistic punishment [28–30]. What is clear is that already by 3 years of age, children are capable of intervening on the behalf of others, quite unlike our closest living relatives tested in a comparable situation [3]. It appears that in humans, intervening on the behalf of others begins with a concern for the victim before becoming focused on consequences for the perpetrator.

**EXPERIMENTAL PROCEDURES**

**Experiment 1**

We tested 58 3-year-old children (age range [as year;month] = 3;3–3;9, mean = 3;6, 24 boys) and 79 5-year-olds (age range = 5;3–5;9, mean = 5;6, 36 boys) in a mid-sized German city. The research was conducted in accordance with the human ethics guidelines of Germany and was approved by the department’s human ethics committee. Ten 3-year-olds were excluded because they showed signs of distress and did not complete testing. Seven 5-year-olds were excluded due to experimenter error (one), unwillingness to participate in the test (three), and interference with the test apparatus (three). A pilot study on adults showed that they understood the apparatus and the procedure and interpreted the conditions appropriately. The children were brought to the testing room individually by an experimenter (moderator) who introduced them to the two puppets who were controlled by two other experimenters. They were then familiarized with the apparatus by first being asked to pull the rope to observe the consequences, namely that the table could turn in only one direction and would then become locked at the inaccessible cave where objects could not be recovered. They then used the table and toys with the puppets. The experimenter then asked the child to move the objects after the last puppet played with them so that they would come to rest in an inaccessible cave. This was done so that the child would know that he or she could prevent the puppets from accessing the objects and that the puppets would also know this (in effect, “trashing” the objects [31]). Normative terms such as “punish” were not used, and none of the puppets protested, implying consent. Children were assigned to one of four treatments (theft, unfair, loss, and permitted taking) according to how the objects were taken and who benefitted (between subjects), and they participated in both 3P and 2P conditions (within subjects, three trials of each, counterbalanced for order in a blocked design between subjects). In theft, the thief puppet pulled the rope, moving the turntable and claiming the objects (marble game, stamps, or cookies) on it. In 3P theft, she pulled the objects from the child; in 3P theft, these were taken from the victim puppet. In the unfair treatment, another puppet (stranger) would enter the room and turn the objects from the child to the thief puppet (2P unfair) or from the victim puppet to the thief puppet (3P unfair). The loss treatment was similar, except that there was no one in the thief’s position. Finally, in the permitted-taking treatment, the child or the victim puppet consented to the thief pulling the rope to take the objects (Figure 1). Children could pull the rope, causing the objects to move from the thief’s position to the cave, or do nothing. Trials ended after 1 min if they did nothing or when the objects came to rest in the cave. The puppets never communicated with or made direct eye contact with the children (neither did the experimenters controlling the puppets), and protests by the puppet in the victim’s position were never.
directed at the children. None of the puppets or experimenters in any way commented on the choices made by the children.

**Experiment 2**
Participants were 54 3-year-olds (age range = 3:3–3:9, mean = 3:5, 30 boys). None of the children had participated in experiment 1. Six children were excluded from the analysis due to experimenter error (one), fear of the puppets (two), failing to meet criteria in familiarization (one), and feeling uncomfortable with the test (two). Children were randomly assigned to one of the four treatments as before and given both 2P and 3P conditions. They were introduced to an apparatus that had two ropes that they could pull, and the table could move freely. Importantly, the table would not stop at the cave position; if children wanted the objects to stop in that position, they had to stop the table manually. Trials lasted 1 min if the children did nothing or ended once the child had moved the apparatus and stopped it in one of the four positions. All trials in both experiments were videotaped and coded for reliability (choice: Cohen’s κ = 1.000).

**SUPPLEMENTAL INFORMATION**
Supplemental Information includes Supplemental Experimental Procedures, one figure, and five tables and can be found with this article online at http://dx.doi.org/10.1016/j.cub.2015.05.014.

**ACKNOWLEDGMENTS**
We would like to thank Angela Loose for research assistance; Georg Keller, Monique Horstmann, Nadir Bobovinikov, Marte Krüger, and Diana Paschenda for their involvement with the experiments; Manfred Ulrich for building the apparatus; Roger Mundry for statistical advice; Eric Jensen for photo permission; Petra Jahn and Marlen Sureck for multimedia support and 3D imaging; and the children and their parents for participating in these studies.

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**REFERENCES**
Restorative Justice in Children
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Figure S1. The Turntable Apparatus From the Child's Perspective.

(A-D) Illustration of the turntable apparatus and setup during the testing phase. The child sat in the foreground in front of a round table. The victim's position is to the left of the child and the thief's position is across. On the right is the inaccessible cave. The child had access to one rope, allowing him or her to move the turntable clockwise. There were two rope ends in the thief's position (not visible), but only the one that could turn the table clockwise was used. In the starting position a toy is either placed in front of the child (A) or in the victim's position (B). The toy is then moved to the thief's position (C) by pulling a rope in front of the thief's position. The child could pull his or her rope (D) to rotate the table clock-wise, resulting in the objects to be irrecoverably moved into the cave. See also Figure 1.
### Table S1. Comparison of 2P and 3P conditions for 3- and 5-year old children.

<table>
<thead>
<tr>
<th>Conditions</th>
<th>3-year-olds</th>
<th>5-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>theft: 2P vs. 3P</td>
<td>$T^* = 4.5, n = 12 , (7 , \text{ties}), , p = 0.5$</td>
<td>$T^* = 0, n = 18 , (15 , \text{ties}), , p = 0.25$</td>
</tr>
<tr>
<td>unfair: 2P vs. 3P</td>
<td>$T^* = 0, n = 12 , (10 , \text{ties}), , p = 0.5$</td>
<td>$T^* = 8.5, n = 18 , (13 , \text{ties}), , p = 0.938$</td>
</tr>
<tr>
<td>loss: 2P vs. 3P</td>
<td>$T^* = 12, n = 12 , (7 , \text{ties}), , p = 0.313$</td>
<td>$T^* = 6, n = 18 , (15 , \text{ties}), , p = 0.250$</td>
</tr>
<tr>
<td>permitted taking: 2P vs. 3P</td>
<td>$T^* = 0, n = 12 , (10 , \text{ties}), , p = 0.5$</td>
<td>$T^* = 6, n = 18 , (15 , \text{ties}), , p = 0.250$</td>
</tr>
</tbody>
</table>

Significant effects are shown by *.

### Table S2. Comparison of theft and other treatments for 2P and 3P conditions for both 3- and 5-year-olds.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>3-year-olds</th>
<th>5-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2P theft vs. 2P permitted taking</td>
<td>$U = 44.0, n_1 = n_2 = 12, p = 0.089$</td>
<td>$U = 62.0, n_1 = n_2 = 18, p &lt; 0.001 ,*$</td>
</tr>
<tr>
<td>2P theft vs. 2P unfair</td>
<td>$U = 69.0, n_1 = n_2 = 12, p = 1.0$</td>
<td>$U = 123.0, n_1 = n_2 = 18, p = 0.176$</td>
</tr>
<tr>
<td>2P theft vs. 2P loss</td>
<td>$U = 48.5, n_1 = n_2 = 12, p = 0.162$</td>
<td>$U = 103.0, n_1 = n_2 = 18, p = 0.041 ,*$</td>
</tr>
<tr>
<td>3P theft vs. 3P permitted taking</td>
<td>$U = 30.0, n_1 = n_2 = 12, p = 0.005 ,*$</td>
<td>$U = 91.0, n_1 = n_2 = 18, p = 0.115 ,*$</td>
</tr>
<tr>
<td>3P theft vs. 3P unfair</td>
<td>$U = 70.0, n_1 = n_2 = 12, p = 0.904$</td>
<td>$U = 139.0, n_1 = n_2 = 18, p = 0.475$</td>
</tr>
<tr>
<td>3P theft vs. 3P loss</td>
<td>$U = 69.0, n_1 = n_2 = 12, p = 0.904$</td>
<td>$U = 148.5, n_1 = n_2 = 18, p = 0.723$</td>
</tr>
</tbody>
</table>

Significant effects are shown by *.

### Table S3. Comparison of 2P and 3P conditions for 3-year old children.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>3-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>theft: 2P vs. 3P</td>
<td>$T^* = 0, n = 12 , (7 , \text{ties}), , p = 0.063 ,*$</td>
</tr>
<tr>
<td>unfair: 2P vs. 3P</td>
<td>$T^* = 5.0, n = 12 , (7 , \text{ties}), , p = 0.750$</td>
</tr>
<tr>
<td>loss: 2P vs. 3P</td>
<td>$T^* = 3.5, n = 12 , (8 , \text{ties}), , p = 0.750$</td>
</tr>
<tr>
<td>permitted taking: 2P vs. 3P</td>
<td>$T^* = 4.0, n = 12 , (7 , \text{ties}), , p = 0.438$</td>
</tr>
</tbody>
</table>

Significant effects are shown by *.

### Table S4. Comparison of theft and other treatments for 2P and 3P conditions for 3-year-olds.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>3-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2P theft vs. 2P permitted taking</td>
<td>$U = 31.5, n_1 = n_2 = 12, p = 0.014 ,*$</td>
</tr>
<tr>
<td>2P theft vs. 2P unfair</td>
<td>$U = 70.5, n_1 = n_2 = 12, p = 0.971$</td>
</tr>
<tr>
<td>2P theft vs. 2P loss</td>
<td>$U = 61.5, n_1 = n_2 = 12, p = 0.688$</td>
</tr>
<tr>
<td>3P theft vs. 3P permitted taking</td>
<td>$U = 44.0, n_1 = n_2 = 12, p = 0.102$</td>
</tr>
<tr>
<td>3P theft vs. 3P unfair</td>
<td>$U = 65.0, n_1 = n_2 = 12, p = 0.734$</td>
</tr>
<tr>
<td>3P theft vs. 3P loss</td>
<td>$U = 54.5, n_1 = n_2 = 12, p = 0.326$</td>
</tr>
</tbody>
</table>

Significant effects are shown by *.

### Table S5. Restoration of objects to original owners in 2P and 3P conditions for 3-year-olds.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>3-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>theft: 2P vs. 3P</td>
<td>$T^* = 0, n = 12 , (5 , \text{ties}), , p = 0.016 ,*$</td>
</tr>
<tr>
<td>unfair: 2P vs. 3P</td>
<td>$T^* = 4.0, n = 12 , (7 , \text{ties}), , p = 0.50$</td>
</tr>
<tr>
<td>loss: 2P vs. 3P</td>
<td>$T^* = 3.5, n = 12 , (8 , \text{ties}), , p = 0.750$</td>
</tr>
<tr>
<td>permitted taking: 2P vs. 3P</td>
<td>$T^* = 3.5, n = 12 , (5 , \text{ties}), , p = 0.094$</td>
</tr>
</tbody>
</table>

Significant effects are shown by *.
Supplemental Data

Experiment 1

There were no order effects for either 3-year-olds, namely children’s responses were not influenced by whether they participated in second-party (2P) trials or third-party (3P) trials first (Kruskal-Wallis \( \chi^2 = 0.001, p = 0.973 \)). The same was true for 5-year-olds (Kruskal-Wallis test: \( \chi^2 = 0.234, p = 0.628 \)).

Three- and 5-year-olds turned the table as often in the 3P as in the 2P conditions of all treatments (Table S1). Looking at the between-subjects treatments, (e.g., 2P theft vs. 2P permitted taking, and 3P theft vs. 3P permitted taking), we examined how children responded within the 2P and 3P conditions (Table S2). Comparing across treatments in the 2P condition, children responded differently (3-year-olds \( \chi^2 = 6.491, p = 0.090 \); 5-year-olds \( \chi^2 = 13.490, p = 0.004 \)). When they were directly affected by the actions of the puppets, 3-year-olds tended to put the objects into the cave more often in the 2P theft treatment than in the 2P permitted-taking treatment; this effect was significant for 5-year-olds. Both 3- and 5-year-old children responded equally when objects were stolen from them by the thief puppet, as to when the stranger puppet created an unfair outcome by taking the objects away and giving them to the other puppet in the thief’s position. Only 5-year-olds were more likely to turn the table in the 2P theft treatment compared to 2P loss when there was no one in the thief’s position. Across 3P treatments, the children responded differently (3-year-olds \( \chi^2 = 9.054, p = 0.029 \)) or tended to (5-year-olds \( \chi^2 = 7.184, p = 0.065 \)). Children of both ages intervened more often when a third party’s object was stolen than when the “victim” permitted the object to be taken. In contrast, unfair outcomes and loss produced levels of responding comparable to theft.

Latencies were examined because children might take longer to respond in the 3P treatments than the 2P treatments, perhaps because it would take longer to process norms than to react to a personal outcome. Longer latencies could also indicate a sensitivity to the vocal responses of the puppet in the victim’s position. For 3-year-old children there was no overall difference of latencies between 2P and 3P (\( T^* = 49.00, n = 14 \) (0 ties), \( p = 0.855 \)). Likewise for 5-year-old children there was no difference in the time it took to respond in 2P and 3P (\( T^* = 464.50, n = 39 \) (0 ties), \( p = 0.304 \)). Children of both ages, then, took as long to respond to outcomes that affected a third party as for themselves, taking less than 15s of the 1 min trials to do so when they chose to turn the table at all.

In addition to turning the table, children could, and did, express themselves verbally. They protested toward the puppet in the thief’s position, tattled to the moderator and expressed positive (prosocial) comments. Besides frequent hints of protests like utterances without clear attributions such as, “Oh!” and “Grr!” [S1] and simple protests like, “Hey!” and “No!” we followed Rakoczy, Warneken & Tomasello [S2] and Rossano, Rakoczy & Tomasello [S3] by classifying protests as normative, namely referring to rules (e.g., “You are not allowed to take them away,” “This is to punish you,” and “You don’t get that because you are too little”), and imperative, namely commands (e.g., “Don’t do it again,” “No, this is not for you,” “This is Lola’s,” and “This is mine”). Tattling [S4] involved directing their verbal response to the moderator and included examples such as, “Maja pulled that there,” “Look, she has taken it away,” and “She already did that with me”. Prosocial responses included excuses, suggestions and approaches to comfort and to help the puppet in the victim position [S1]: “Why can’t I pull it to Lola?”, “Have you brought something else for you?”, “Go to the other side,” “I can only pull that way,” “Come, we go there.” There were no prosocial comments in the 2P treatments. A visual examination of the results shows children protested and tatted more in the 2P treatments – even when they permitted the puppet to take the objects – than in the 3P treatments. This may have been due, in part, to the expectation that
the puppet was herself already protesting and could have tattled. Even so, the children responded verbally on behalf of a third party, using normative protests, even for loss and permitted taking where it can be seen as unfair to be repeatedly asked to give up a toy or food after having just received it. Examples, translated from German, are presented below.

3-year-olds

Normative protest:

2P theft:  She has taken it away from me again. But you are not allowed to take it again. // No, you don’t get it because you are too little.
2P unfair:  Nee. You can’t nibble.
2P loss:   She just took it from me. // Because she stole it.
2P permitted taking:  But, you should hand one to me. // Should we do in turn, always?
3P theft:  Taking away is not nice.
3P unfair:  No! You are not allowed to do that.
3P loss:   You know, the stamps are gone. That is not allowed to do, isn’t it?
3P permitted taking:  (no examples)

Imperative protest:

2P theft:  Don’t take it away, again. // No, they belong to me! // No, these are for me, not yours!
2P unfair:  But that was for me. And now, the toys are in the cave again. // You did not get them.
   I have put them in the cave.
2P loss:   I can’t do anything. // Hey, this is mine. // Hey, you have taken it from me.
2P permitted taking:  But then it is my turn, yes? // But don’t eat all. // But then I get them.
   Otherwise I push them in here.
3P theft:  This is Lola’s. She has brought it.
3P unfair:  No, not yours. // Can I pull away? I soon pull away.
3P loss:   But, when Maja comes back, and pulls back, then we are also coming. Now, no one can play with it anymore. I have caught them.
3P permitted taking:  But, don’t eat all, yes? He also wants some.

Tattling:

2P theft:  Can you have an eye on it? // Look, again away. From my place. // Look, what he has done.
2P unfair:  Look, look, my cookies, all gone. // But, that is for me. // He has pulled away again.
2P permitted taking:  (no examples)
3P theft:  Look, she has taken it away.
3P unfair:  Papa, that has twisted again and she has taken it away, again.
3P loss:   You know, again, the marble track. // You, have you seen it? She just simply has taken it away from him.
3P permitted taking:  (no examples)

Prosocial:

3P theft:  This is Lola’s. She has brought it. It is from her.
3P unfair:  (no examples)
3P loss:   Wait, I bring them back. // You, they are in the cave. // I asked for it.
3P permitted taking:  But, don’t eat all. // He also likes some.

5-year-olds

Normative protest:

2P theft:  Next time, you don’t steal my cookies and gummy bears, next time.
2P unfair:  You, Lola. You are my friend, aren’t you? // I want that she not, she is not allowed.
2P loss:   Hey, he just has pulled them over. This is not fair.
2P permitted taking: You only are allowed to marble one. ... I’ve said only one.
3P theft: Please, don’t pull. Otherwise you take it away from her. // You are not allowed to nibble so many cookies. Then, you get a stomach ache, right?
3P unfair: Lola, can you give Pelle her marble track back for a short time? He is your friend.
3P loss: Go away, damned thief!
3P permitted taking: But she only is allowed for one time, yes? // Lola is allowed to do twice, me once, you none.

Imperative protest:
2P theft: Hey, I want to have that! I did not even start. // And, next time you don’t take mine because it is mine.
2P unfair: Don’t pull away. // Always, I can’t play something. // I haven’t had any cookies, yet.
2P loss: You have taken it away from me. Hey, don’t always take it away.
2P permitted taking: Hey, don’t take all, you mouse.
3P theft: Don’t empty all. Don’t do it again. Otherwise I do, otherwise I pull on… But this time, you don’t take it away!
3P unfair: Lola, stop it! Stop it now.
3P loss: Don’t pull, yet!
3P permitted taking: She also already took cookies from me.

Tattling:
2P theft: She has taken it away from me. Now, she should not take away anything. // I pull away if the girl has it.
2P unfair: Hey, I moved it in the cave. Yes, because she also took it from me. // You, she has taken it away from me.
2P loss: She just had …to herself. Hey, you know, she has turned it again. // Hey, he just pulled it over. That is not fair. // Hey, she just turned it to the other side.
2P permitted taking: She always wanted two times and I’ve said one time.
3P theft: Hmm, and then I pull it quickly away, if that is taken away from Pelle.
3P unfair: That was taken away again. // Have pulled something away from Lola. // Her stamps are gone.
3P loss: This was always Maja.
3P permitted taking: She is taking all the cookies.

Prosocial:
3P theft: This, she also has done to me. // But you have one case [of toys] left. // Go there.
3P unfair: Pelle, I have tried everything. // Pelle, just sit down. I try to think how to get the stamps back. Poor Pelle. // Pelle (victim) I do something mean soon, too. I pull them in the cave.
3P loss: This time, she can’t steal it from you. // Come, we go there. I don’t know how I get them back. // I only can pull this way. Have you brought something else for you?
3P permitted taking: We are ready. Do you want also play with the marble track? // We just let her only once.

Experiment 2
There were no order effects for the 3-year-olds, namely children’s responses were not influenced by whether they participated in 2P trials or 3P trials first (Kruskal-Wallis test: \( \chi^2_1 = 0.614, p = 0.433 \)).

With the exception of a trend in the theft treatment, 3-year-olds turned the table as often in the 3P conditions as in 2P (Table S3). There was no difference between 2P and 3P for unfair, loss and permitted taking.

In the 2P treatments, children responded differently from each other \( \chi^2_3 = 11.845, p = 0.008 \). They were more likely to turn the table when the puppet in the thief’s position took the objects away from the child than when he or she consented to having it taken (Table S4).
They were no more likely to do so, however, when the puppet in the thief’s position either received the objects unfairly or when the children lost the objects but there was no puppet in that position. Children also responded differently across the 3P treatments ($\chi^2 = 9.400, p = 0.024$). In contrast to Experiment 1, however, 3-year-olds were no more likely to turn the table when the puppet in the thief’s position took objects from the puppet in the victim’s position than when that puppet consented to having the objects taken. Children in the theft treatment did not turn the table more than in the 3P unfair and loss treatments.

When given a choice between moving objects into the cave, restoring them to the original owner (themselves in 2P and the “victim” puppet in 3P) or giving them to a different owner (themselves in 3P and the “victim” puppet in 2P), they tended to restore more often to themselves when the object was stolen than there were to restore it for the puppet in the victim’s position (Table S5). They tended to do so more often, as well, when permission was given to the puppet in the thief’s position.

For the 3-year-old children, there was an overall difference in latencies between 2P and 3P ($T^+ = 299.5, n = 29$ (2 ties), $p = 0.007$), but none of the pairwise comparisons (e.g., 2P theft vs. 3P theft) were significant (all $p > 0.19$).

Children also protested and tattled in Experiment 2. As in Experiment 1, protests were utterances (e.g. “Ahh”, “Hey”) and simple protest (“No”, “Mine”), but also both normative (e.g., “This is not okay”) and imperative (e.g., “No, don’t pull it there). They tattled, as before (e.g., “No, look, she has taken it away”). They had a wider range of prosocial responses given that they could deliver items back to the puppet in the victim’s position (e.g., “These are yours, I turn it,” “You know, the puppet [thief] did not get it,” and “There, I move it to me”). They had positive comments for the puppet, particularly in 3P loss (when the child was alone with the puppet in the victim’s position).

Supplemental Experimental Procedures

Experiment 1

The apparatus was a wooden turntable (100 cm diameter) that stood 45 cm high, allowing a child to sit comfortably on a small chair in front of it. The turntable was divided into quarters by 25 cm high clear Plexiglas panels. The area around the turntable was subdivided in the same manner with 75 cm high clear Plexiglas panels. These divisions demarcated the child’s position and the positions of the other “players”, as well as an inaccessible area (the cave). In addition to demarcating the areas, this arrangement prevented the children from moving to areas other than their own. From the child’s perspective, the “victim’s’” position was to the left, the “thief’s” across from him or her, and the “cave” to the right (Figure S1).

Underneath the turntable was a pair of ropes that allowed the table to be turned. One rope end was in the child’s position; there were two rope ends in the thief’s position, but only one was pulled; there was no rope in the victim’s position to make it evident that the puppet in the victim’s position could not control the apparatus. Pulling the rope in the child’s position caused the table to rotate clockwise. The table could not be moved past the cave; pulling the rope from the thief’s position caused the table to rotate from the starting position (objects in front of the child’s or victim’s position), and it could be stopped at any point up to the thief’s position. Rotating the table further caused the table to become locked into the cave position until released by an experimenter. The objects were desirable items namely plastic toy animals and a wooden locomotive (familiarisation trials), as well as a marble-and-ramp toy, rubber stamps and a jar of cookies (test trials).
Large puppets (45 cm tall) were used to interact with the children (Living Puppets®, Matthies Spielprodukte GmbH & Co.KG, Hamburg, Germany). The puppets had glove-like hands that the experimenters could put their hands into, allowing the table and items to be manipulated. Two puppets (named Lola and Pelle) would sit at the table in either the thief's position or victim's position (the positions were counterbalanced across children). A third puppet, Maja, was used in four of the conditions as a “stranger.” Parents were not present in the testing room.

All trials were recorded with three video cameras that were positioned in the corners of the testing room. A fourth camera was connected to a Sony DV-Walkman outside the testing room so that the experimenters could see their entrance cues. One of the cameras was connected to a DV-Walkman so that the moderator, who sat behind a screen inside the testing room, could see the trials and intervene when necessary.

**Procedures**

(i) **Warm-up - Moderator and Puppet familiarisation**

Before entering the testing room, the child met the experimenter they would be interacting with (moderator). After ten to 30 minutes of play with the child in a warm-up room, with the parent present, the moderator took the child to the testing room. The parent was not present during testing. Before entering the testing room, the moderator introduced the puppets, Lola and Pelle (operated by two experimenters), who played games with the child for several minutes. The moderator then took the child inside the testing room and showed him or her the apparatus while the puppets waited outside.

(ii) **Apparatus familiarisation**

In the first part of the familiarisation, the moderator introduced the child to the apparatus and demonstrated the consequences of pulling the ropes, namely that the object on the table, such as a toy dinosaur, rotated past the other two positions and finally stopped in an opaque metal box with a locked door (cave). The moderator emphasised that the object could not be turned further than that, nor back again, and that the object in the cave could only be accessed by the moderator. The moderator would first pull the rope in the thief's position, moving the toy in front of him. He then moved to the child's position and asked him or her to pull the rope, causing the toy to move into the cave. He would then point out that the toy could not come out of the cave, except by the moderator who had a special key, and he asked the child to try to pull the rope and shake the table. These actions demonstrated to the child that objects could not come out of the cave. The moderator then used the key to open a door on the side of the cave and he took the toy away. The criterion for understanding the relationship between pulling the ropes and objects ending up in the cave was reached when the child managed to pull the dinosaur into the cave. Help was given in those cases if a child did not manage to move the toy animal on his or her first attempt. The moderator would then suggest to the child how he or she could hold her hands to pull the rope. All children managed to pull the dinosaur into the cave, and the moderator reminded the child that no one could get toys from there.

The moderator then suggested that they could invite the puppets, Pelle and Lola to join them. On this cue, the puppets knocked on the door, entered the room and the moderator showed them their positions and the second phase of the familiarisation began. The goals of this phase were to demonstrate that the puppet in the thief’s position, across from the child, had a rope that could be pulled, whereas the puppet in the victim’s position did not have access to a rope. Furthermore, the child could only turn objects into the cave, and that all the players knew this. Neutral terms such as “move” and “take” were used rather than normative terms such as “steal” and “punish” to avoid priming punitive or fairness sensitivities in the children. It was important for the children to understand through action that only they and the
puppet in the thief’s position could turn the table, only in one direction, with the consequence of causing the object to be locked in the cave. Two rounds were played, once with toy animals that each player could add to the table, and once with a wooden train onto which each player could add a car. The purpose of these rounds was to give a coherent reason for why the child, then the two puppets in turn, would want access to the play area of the table.

The first puppet to the child’s left would announce that she discovered an animal (or train car) after the child had played with the objects, then the moderator would ask the child’s permission to move the play area to the puppet in the victim’s position. Once the child consented, the moderator would pull the rope in the thief’s position so that the toys moved to the victim’s position. After the first puppet played for a moment, the puppet in the thief’s position would discover a toy and then explain that she had a rope to turn the table. She did this without attending to the puppet in the victim’s position, who then announced that the toys had been taken. In a neutral tone, the moderator suggested that the child to pull his or her rope. Once the child did this, the puppet in the thief’s position tried to pull the table back and shook it without success. The puppet in the victim’s position emphasised that she did not have any rope and likewise shook the table. The moderator told the puppets that the toys could not be recovered. The purpose of this familiarisation trial was to demonstrate to the child that the puppets also knew of the inaccessible cave and the consequences if the child pulled the rope. In this way, an option to intervene was made clear without emphasising it as punishment as such or using punitive terms.

(iii) Testing

We used a mixed factorial design in which children were randomly assigned to one of four treatments (“theft”, “loss”, “unfair” and “permitted taking” with 12 3-year-old children and 18 5-year-olds, half boys and half girls, in each) and two conditions within each treatment (2P and 3P). Each child was tested in six trials within a single session. Three of the trials were 2P (i.e., there was no victim puppet present and the child started with the items in front of him or her on the turntable) and the other three were 3P (i.e., with the items starting in the victim’s position). 2P and 3P conditions were presented in a blocked design with order counterbalanced across participants. Between the two blocks of conditions the moderator and the child played a wooden puzzle game to maintain the child’s interest. Objects on the turntable [marble game, stamps and cookies] were changed after each trial to maintain interest and accommodate possible individual preferences and were presented in a randomised order. In 2P trials, the moderator would put these objects on the turntable in front of the child. In 3P trials, the puppet in the victim position [Lola or Pelle] would announce that she brought cookies or a toy, search for them, then find them in a case before putting them in front of her on the table. All the while, the puppet would describe her actions aloud (although not directed at either the child or the other puppet); this would engage the child’s interest and demonstrate the puppet’s excitement about the objects.

In the theft treatment, the puppet in the thief’s position (thief) took the items away from the puppet in the victim’s position (3P condition) or the child (2P condition) by pulling the rope. As soon as the victim or child started to play with the toys or was about to reach for the cookies, the thief would say, “I will pull this rope here. Now I can play with [eat] it.” This announcement was egocentric speech; it was not directed at the other puppet or the child. The thief would then play with the toys or pretend to eat a cookie.

In the unfair treatment, a “stranger” puppet (Maja) entered the test room, went to the cave position and said (to no one in particular), “Hello. Oh, what nice thing are you doing here?” The stranger then moved to the thief’s position while the puppet there was turned away, and pulled the rope, moving the objects from the puppet in the victim’s position or the child. The stranger then said to the puppet in the thief’s position, “Now you can play with it.”
She then said goodbye to no one in particular and left the room. The puppet in the thief’s position would then turn back and use the items.

In the loss treatment, the stranger took items away from the puppet in the victim’s position (3P condition) or the child (2P condition) and moved them to the empty thief’s position. In the permitted-taking treatment, the puppet in the thief’s position requested the objects by saying, “Oh, [marbles]! I would like to play with those, please.” In 3P, she would then pull the objects to herself after the other puppet consented. In 2P, she would pull the rope slightly then wait for child to allow her to continue pulling, or let the child move the objects. If the child did not do so right away, the moderator would encourage the child by saying, “Oh, look. [Pelle] would like to play with the marbles,” and if necessary, “Will you let her have them?” If the child would still not give up the objects, the trial ended.

Once objects had been moved into the thief’s position, children were given one minute to respond. They could pull their rope end and move the objects from the thief’s position to the cave. Once this was done, the trial ended. If the child did not pull the rope, the moderator ended the trial.

The puppets had a script that they would follow during the course of the trial. None of the puppets directed their comments at the child. It was important that the puppets responded naturally to the situation; the victim would not be seen as having credibly lost something if she did not show any signs of distress.

In 3P theft, when the thief started to pull the objects away, the victim would protest: “Hey! Those are my [cookies/stamps/marbles]. You have taken my [cookies/stamps/marbles] from me.” The thief would not respond, but just verbalise her happiness with the objects: “Oh, yummy/nice.” The victim would then signal her ownership by saying, “These are mine!” A few seconds later, she would say, “I just don’t know what to do,” while the thief would continue to comment on her enjoyment of the cookies or toys. The victim would be silent for about 10 s, then hang her head and say, “Oh dear.” After the thief commented again on the activity, the victim would say that she wants some, too, but the thief would ignore her. After about 45 s had elapsed from the time of the theft, the victim would again say, “I just don’t know what to do,” and then remain silent for the rest of the trial. At the end of 1 min, if the child did not intervene, the moderator would ask the thief if she finished eating or playing, then clear the turntable. When children moved objects into the cave, the moderator did not come immediately after the response to clear the turntable but rather waited some moments to dissociate his appearance from the child’s response. In 3P unfair and loss, the puppet in the victim’s position would protest and express distress as in 3P theft, but would say, “My [cookies/stamps/marbles] are gone,” instead of, “You have taken them.” In 3P unfair, the puppet in the thief’s position would still express satisfaction with the cookies and toys.

In 3P permitted taking, the puppet in the thief’s position would say, “Oh, [stamps/cookies/marbles]! I would like to have them, please.” The requesting puppet would then pull the table slightly then wait for a response. The moderator would say, “Oh, look, [Pelle]. [Lola] would like to [eat the cookies/play with them]. Let her have them.” The puppet in the victim’s position would then enthusiastically say, “Yes, okay!” The puppet in the thief’s position would then pull the rope to move the objects to herself. If the child started to pull the objects toward the requesting puppet, the experimenters would not intervene. The moderator would then move to the corner of the testing room. The requesting puppet would then follow the same script as in 3P theft and 3P loss, namely expressing happiness with the cookies or toys. If the child did not intervene, after 1 min the moderator would return, ask to take the items away, and being a new trial.

Importantly, in all of the 3P trials, the puppet in the victim’s position would not comment on the child’s actions or lack thereof and would not ask for help or in any way direct her speech to the child.
In the 2P trials, the puppet in the thief’s position would act in the same way as in the 3P trials, namely by announcing that she will pull the rope (2P theft) and commenting on her own activity. The puppet did not address the child or respond to the child’s verbal responses or actions.

Regardless of the outcome, in the 3P trials, the puppet in the victim’s position announced that she brought something else for herself and put it on the turntable. In the 2P trials, the moderator announced a new trial and put the object on the turntable in front of the child. After the final test trial, children were allowed to play with all objects, and the puppet in the thief’s position and stranger apologised to the victim and the child for having taking their toys and cookies away.

A typical test lasted no more than 30 minutes.

Coding and Analyses

All data were live-coded. Videotapes were coded for the children’s choices and verbal responses. We coded whether or not children rotated the turntable within 1 minute from the moment the table was turned. For purposes of interobserver reliability, 20% of all trials were coded by a second observer blind to the study’s design (choice: Cohen’s $\kappa = 1.000$).

We analysed the data with non-parametric statistics. Wilcoxon signed rank tests were used for comparisons between 2P and 3P conditions (within subjects), Kruskal-Wallis tests were used for comparisons across treatments for the 2P and 3P conditions (between subjects), and Mann-Whitney tests were used for comparisons among the different treatments (theft, loss, unfair and permitted taking; between subjects). All tests were two-tailed with significance set at 0.05.

Experiment 2

Apparatus and setup

The only modification to the apparatus from experiment 1 was the addition of another rope, leaving two ends the child’s position and two in the thief’s position; again, there was no rope in the victim’s position. Pulling one rope end caused the table to rotate counterclockwise and pulling the other end caused it to rotate clockwise. The child, then, could control the turntable, making objects on it move to any of the positions. The table could be rotated past the cave and left to rest in any position. All trials were recorded as in the previous experiment.

Procedures

The procedures were similar to those in experiment 1. There were no differences with the moderator and puppet familiarisation. The warm-up phase prior to test trials differed in that the child was shown that the table could be turned in both directions by pulling the different rope ends. Importantly, the table could be turned past the cave, allowing the child to bring objects to his or her position and the victim’s position and even the thief’s position. The consequences of pulling the rope ends were demonstrated prior to testing. Specifically, the warm-up phase prior to the test trials consisted of three parts in which children learned how to correctly operate the turntable. In the first part, children learned to pull the ropes and to move a toy dinosaur into the different positions. The moderator would do this by encouraging the child to pull the dinosaur to the position across from him or her, and then to the position to his or her left. Then he suggested that the child move the dinosaur into the cave and the other positions, and he reminded the child that he or she could use either rope end.
Once the child could successfully move the dinosaur to all four positions (victim, thief, cave and self) the second phase began. This second phase served as knowledge criterion check. Other toy animals were put on the table; the moderator would ask the child where he or she would like to move the animals. Once all quarters of the table were occupied by one animal, the moderator and the child decided which animal should be collected and moved to the child's position and put into a little box. Criterion level understanding was demonstrated when the child was able to announce where he or she wanted them to come to a rest and to do so, unprompted, by pulling the rope ends.

At this point, the puppets Lola and Pelle entered the room and were introduced to their positions by the moderator. In the final part of the familiarisation, the moderator put a toy locomotive on the table and the child could demonstrate to the puppets how the locomotive could be moved. The child had to move the train to all positions, especially towards both puppets so that they could add the cars and blocks to the train, and to the cave. The moderator would explain the cave to the puppets. The round was repeated with blocks that they wanted to put on the train car. The child would then independently pull the ropes to move the train to the puppets. The purpose of this familiarisation trial was to demonstrate to the child that the puppets also knew of the inaccessible cave and the consequences if the child pulled the rope. In this way, an option to intervene was made clear without emphasising it as punishment as such or using punitive terms. Children were not restricted to only pull when told, but were given the opportunity to explore how the apparatus worked.

The testing procedure was the same as in experiment 1. The one difference was that between the two condition blocks the wooden puzzle was not played. There was no need to maintain children's interest and keep the level of frustration low since children seemed able to satisfy themselves by restoring objects to the previous owner.

**Supplemental References**


