

BRIEF REPORT

 3- and 5-Year-Old Children's Adherence to Explicit and Implicit
Joint Commitments

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The problem with collaboration is that there are temptations to defect. Explicit joint commitments are designed to mitigate some of the risks, but people also feel committed to others implicitly when they both know together that they each hold the other's fate in their hands. In the current study, pairs of 3-year-old and 5-year-old children ($N = 192$) played a collaborative game. One child was offered individual rewards (bribed) to opt out of the collaboration. In 3 different conditions, the level of the commitment was manipulated. Three-year-old children were more likely to resist the bribes when there was an explicit joint commitment to the partner than when they were only playing in parallel, with their reactions to an implicit commitment falling in between. Five-year-olds were more likely to resist bribes in both the implicit and explicit commitment conditions than in the no-commitment condition. Thus, children at both ages showed some level of commitment to a collaborative partner in the face of bribes to defect, but only 5-year-olds clearly appreciated that a common-ground understanding of interdependence between partners generates an implicit commitment or obligation.

Keywords: collaboration, joint commitments, social cognition

Collaboration can be risky, because one depends on one's partner, who might, in some circumstances, be tempted to abandon the enterprise. As a consequence, people often make joint commitments at the outset to ensure that they both, for example, play their roles appropriately, persist in the face of difficulties, and share the spoils equitably at the end. Basically, the joint commitment puts individuals under normative pressure to keep the well-being of their partner in mind during the collaboration.

Joint commitments are often made explicitly in language: I say "Let's do X" and you say "Okay" (Gilbert, 1990). In principle, one could even be more explicit by using the word *promise* or some-

thing similar. But individuals can also feel jointly committed to one another implicitly if they are interdependent with one another and, crucially, it is in their common-ground understanding that they are. For example, if Person A carpools home every evening with Person B so reliably that when it is B's turn, A forgoes all other means of transportation, with no backups—and A and B both know that this is the case—then B feels obliged to give A a ride home, give A a fair warning, or give A a good excuse. Thus, Michael, Sebanz, and Knoblich (2016) found that when a collaborative activity required more interdependent coordination between adult individuals, they felt a greater sense of commitment to their partner. An encompassing explanation is that the fundamental basis of a joint commitment is the partners' common-ground understanding that they hold the fate of the other in their hands: They each know that each of them must live up to their shared expectations if they are to jointly succeed. The explicit joint commitment is simply a way to ramp up the common-ground understanding so that there can be no misunderstanding.

Young children begin collaborating with adults in simple activities from soon after their first birthdays (Warneken, Chen, & Tomasello, 2006; Warneken & Tomasello, 2007). They seem to form with the mother, for example, a joint goal to do something together, even reengaging her if she is not collaborating appropriately (Warneken, Gräfenhain, & Tomasello, 2012). But collaborating with peers is more challenging. Brownell and Carriger (1990, 1991) found that it was not until 2 or 2.5 years of age that children could coordinate with a peer relatively smoothly and successfully. But in neither of these early kinds of collaborative

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activities would there seem to be a sense of commitment with obligation to the partner. Thus, Gräfenhain, Behne, Carpenter, and Tomasello (2009, Study 1) found that, in contrast to 3-year-olds, 2-year-olds did not persist in collaborating in a situation in which they formed an explicit joint commitment to a partner any more than in a situation in which they did not. Similarly, Hamann, Warneken, and Tomasello (2012) found that 2-year-olds, again in contrast to 3-year-olds, did not persist in helping a partner reach the partner's goal more in a collaborative than in a noncollaborative context. One possibility is that 2-year-olds may reengage a partner because they feel it is more fun to do things collaboratively, but they do not, as do 3-year-olds, take joint commitments to bind them to persistence in the face of temptations to do other things.

The clearest signs of an understanding of joint commitment emerges at around three years of age when children begin to use normative language (e.g., *should*, *must*) in the context of collaboration and also to make excuses for defection. Thus, Kachel, Svetlova, and Tomasello (2018) found that 3-year-old children understood that making an explicit joint commitment to a peer partner meant that one had to fulfill one's role in a way that helped the team to bring joint success, and indeed children protested against peers' not playing their role appropriately, using explicitly normative language (e.g., *No, you must do X*). Gräfenhain and colleagues (2009, Study 2) found that after making an explicit joint commitment with an adult (orchestrated by the adult but explicitly agreed to by the child), 3- and 4-year-old children were loath to break it, "taking leave" or otherwise verbally acknowledging the commitment if they had reneged. Kanngiesser, Köymen, and Tomasello (2017) found that 3- and 5-year-old children were more likely to keep performing a boring task if they had explicitly promised an adult to do so, and when their partner reneged on a promise, they again protested with normative language.

But just as in adults, under the right conditions young children can also enter into an implicit joint commitment. Hamann and colleagues (2012) found that 3-year-old peers (but not 2-year-old peers) helped one another more readily if they were collaborating—with a common ground understanding that they were interdependent with one another for joint success—than if they were not collaborating. Likewise, Hamann, Warneken, Greenberg, and Tomasello (2011) found that 3-year-old peers (but again not 2-year-old peers) shared the spoils of the collaboration with one another more readily if they were collaborating—again presumably with a common-ground understanding that they were interdependent with one another for joint success—than if they were not collaborating. The peers feel they are obligated to keep the partner's well-being in mind—even without a verbally expressed explicit joint commitment—because they know together in common ground the effects that each of their actions has on the other.

Looking across studies, one may question the role of explicit versus implicit joint commitments. It may be the case that adults honor both types of commitment equally because the implicit version, like the explicit version, makes their dependence on one another clearly manifest and salient to them both (e.g., when both see the need to move an obstacle together and just begin doing so). But it might be, developmentally, that young children first need to experience explicit joint commitments in language (and the consequences of breaking them) before implicit joint commitments would feel binding to them. The opposite possibility is that the

reengagement attempts of toddlers' have already started children on the road to an appreciation of joint commitments and that learning to verbalize the commitment is simply making the implicit explicit.

In the current study, therefore, we explored the development of children's sense of commitment to a peer partner when they had made either an explicit or implicit joint commitment. The strength of their commitment was measured by their behavior when faced with a material reward or temptation to defect from the collaboration. As a baseline, children also participated in a condition in which they were simply playing beside a peer in parallel. We tested 3- and 5-year-old children because previous research has suggested that by the age of 3, children possess the competence to collaborate effectively with a peer partner (e.g. Hamann et al. 2011, 2012; Kachel et al. 2018). Our question was whether children this young would persist in collaborating in the face of strong temptations to defect (presented at two different strengths) and whether their persistence would be different at the different ages, depending on whether the commitment was implicit versus explicit.

Method

Participants

Participants were 96 children (48 boys) 3.5 years old ($M = 43.7$ months, $SD = 2.1$) and 96 children (48 boys) 5.5 years old ($M = 66.1$ months, $SD = 1.6$) of heterogeneous socioeconomic backgrounds (predominantly middle-class and Caucasian) attending preschool in a medium-sized German city. Prior to the study, parents had given informed consent for their children's participation. Children were tested in same-sex dyads. In each dyad, only one child was an actual subject; the second child (hereafter the partner) was trained as a confederate but remained naïve to that. Children were randomly assigned to the three experimental conditions and their role in the dyad (subject or partner). Sixteen additional dyads were tested but excluded from analyses due to errors in the procedure: experimenter ($n = 2$), camera malfunction ($n = 1$), inattentiveness of the subject or partner child ($n = 5$), failed pretest ($n = 8$). Dyads were trained and tested in a quiet room in their kindergarten in a session lasting approximately 60 minutes. The procedure of this study (Children's Adherence to Explicit and Implicit Joint Commitments) was approved by the Child Subjects Committee of the Max Planck Institute for Evolutionary Anthropology.

Materials and Design

Participants were tested in three conditions (parallel-play condition, implicit-commitment condition, and explicit-commitment condition) in a between-subjects design. In all three conditions, subjects and their partners were trained to obtain two wooden beads (one for each child, to make a bracelet later) from an apparatus. The apparatus was a modified version of the apparatus used by Hamann et al. (2011) and Hamann, Bender, and Tomasello (2014). To obtain the beads, both children had to pull on a rope to move a block toward the two beads. The block then moved and pushed the beads from their platform, and they rolled toward two separate openings, where the players could retrieve them. Accord-

ing to the three experimental conditions, the subject and the partner were either independent and could acquire their bead each by themselves (parallel-play condition), were dependent on one another and knew this (implicit-commitment condition), or were dependent on each other and made an explicit joint commitment (explicit-commitment condition). In the implicit-commitment and the explicit-commitment conditions, pulling on the rope alone was ineffective because the block would not move and accessing both ends of the rope was impossible (see Figure 1 Panels B and C). This created the necessity for collaboration. In the parallel-play condition, each child had a separate block to access the bead inside of the apparatus and could therefore be successful alone (see Figure 1A).

As children confronted the task, their ropes were not immediately accessible but had to be retrieved from within a forced-choice panel. The panel consisted of two chambers such that opening one would block the other. During the test trials, one chamber con-

tained the rope allowing them to collaboratively pull with the partner, and the other contained a “bribe” reward to induce the child to defect from the collaboration. Manipulated within-subject across trials, the bribe was either of a low value (double the reward for collaboration: two vs. one) or a high value (quadruple the reward for collaboration: four vs. one). A barrier between the two children prevented both children from easily seeing which chamber of the forced-choice panel the play partner decided to open and what each chamber contained. Dyads were randomly assigned to the three experimental conditions; within each dyad, children were randomly assigned to their role in the dyad (subject or partner).

Procedure

Dyads of children were picked up in their classroom and brought to the test room by the lead experimenter (E1). After a brief familiarization, both children received two joint training trials

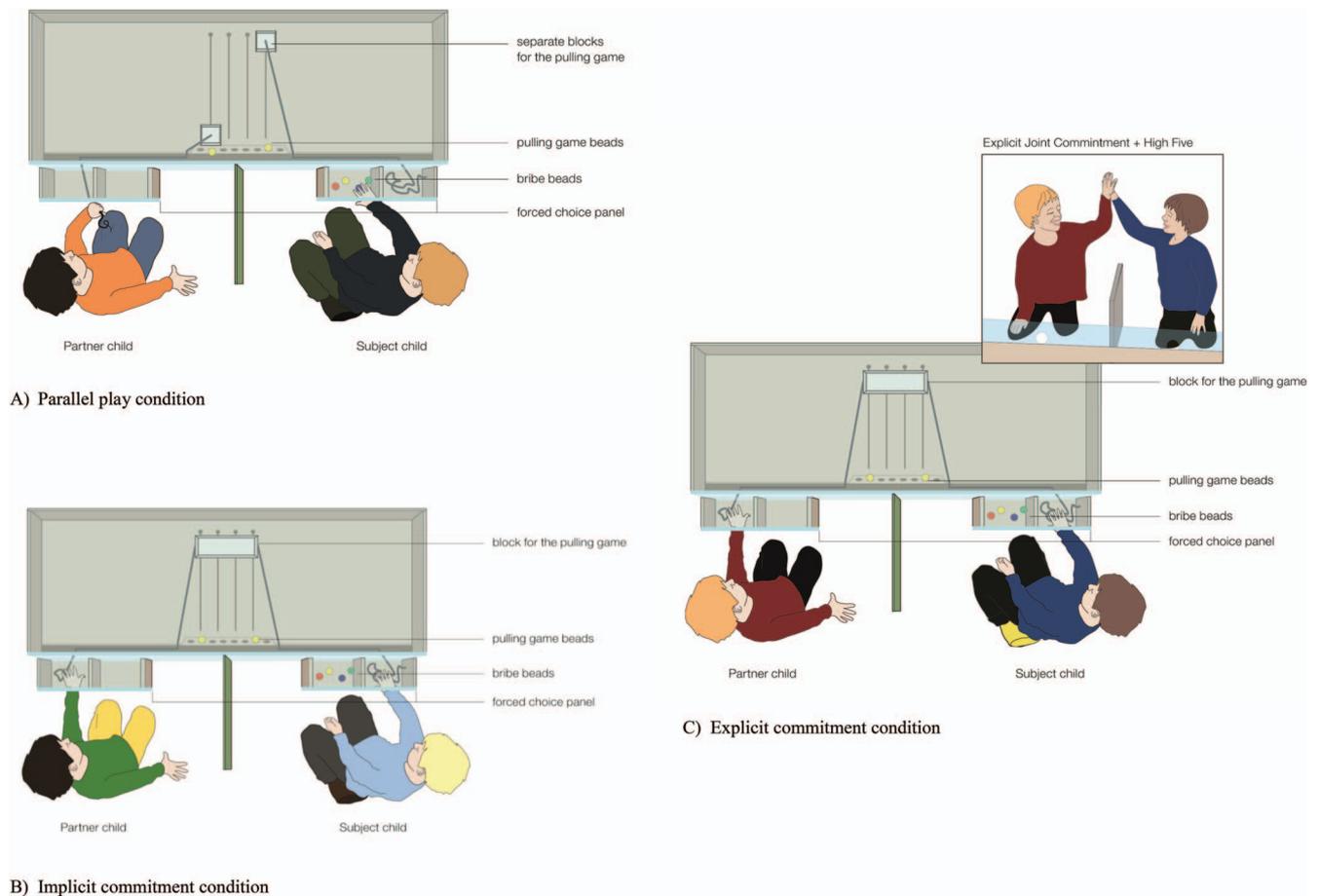


Figure 1. Schematics for the three conditions. In all three conditions, the partner child’s only option was the rope for the pulling game. The subject could choose between the rope and the bribe that was offered in the second chamber of the forced-choice panel. In the parallel-play condition (Panel A), each child had her own block and could pull independently; in the implicit-commitment condition (Panel B), there was only one block for both children, creating the interdependence between both players; and in the explicit-commitment condition (Panel C), there was again only one block for both children, creating interdependence, and on top of that, both children formed an explicit joint commitment to pull together (verbally and with a high five). See the online article for the color version of this figure.

with E1 and an assistant (E2) to learn the rope-pulling game and the mechanism of the forced-choice panels. The training ensured that both children understood together the interdependent or parallel aspect of the game in their condition, that is, that one partner could not pull and retrieve the rewards if the other did not participate (in the implicit-commitment and the explicit-commitment conditions; see Figure 1, Panels B and C) or that one partner could pull and retrieve the reward without the other partner's help (in the parallel-play condition; see Figure 1A). Furthermore, both children learned to stay quiet and to open only one of the chambers after a signal from E1 (knocking on the door). Both children collected their beads in an opaque container to make sure that they could not keep track of how many beads they had already collected or who had collected more. Then both children received two separate training trials with E1 while the other child was outside with E2.

Separate training for the subject child. In the separate training trials for the subject, the children were familiarized with the situation that both chambers of the forced-choice panel can be baited and that they could choose what they prefer. In both of these separate training trials, the rope was not assessable. One chamber (where in the previous training trials and the following test trials the rope was placed) was baited with a single bead; the other was baited with three beads. To progress to the test trials, subjects had to show a preference for three over one bead in both trials. This served as a preference test to show that children generally prefer more rewards over fewer rewards and to make sure that children did not have a side bias toward the rope chamber (after a passed preference test, both sides were opened equally often in the training trials) and would feel comfortable to choose freely between the rope and the offered bribe in the test trials. Furthermore, E1 told the subject children that beads from their forced-choice panel go in only their bead collector.

Separate training for the partner child. In the separate training trials for the partner child, E1 repeated the procedure from the rope-pulling game and played with the partner child. The forced-choice panel of the partner child's was baited with only the rope, and the other chamber remained empty. Furthermore, E1 told the partner child that E2 had additional secret beads and would give them to her if E2 called for her (this ensured that the partner child would not end up empty-handed if the subject child accepted the bribe reward in the test trials).

Pretest trial. In a pretest trial E1 called the subject in the test room first. E1 and the subject then looked at both forced-choice panels. E1 pointed out what options the partner child and the subject had (in both forced-choice panels one chamber was empty and one contained the rope). Then, E1 reminded the subject that he or she could choose to open whichever chamber. Last, E1 asked the subject whether the partner could pull the block in the apparatus alone or not. Children in the parallel-play condition had to answer "yes" (see Figure 1 A), and children in the implicit-commitment and the explicit-commitment conditions (see Figure 1, Panels B and C) had to answer "no"; otherwise they were reminded. After that, E1 called in the partner child. Then, children in the explicit-commitment condition were encouraged to form an explicit joint commitment before each trial (pretest and test trials); that is, E1 asked children individually whether they would play the game again together with the other child. Both children had to agree verbally and were asked to "high five" with the partner (see Figure 1C). To pass the pretest trial, both children had to open the

right chamber of the forced-choice panel (the one containing the rope) and pull together. After that, the test trials followed.

Test trials. The six test trials proceeded exactly like the pretest trial. E1 pointed out that in the partner child's forced-choice panel, one chamber was empty and one contained the rope. But in the subject's forced-choice panel, one chamber now contained the bribe (either two or four beads) and one contained the rope. Then, E1 reminded the subject that she could choose to open whichever chamber she wished. The value of the bribe reward (high or low) was alternated across trials, and whether the first bribe was a high or a low offer was counterbalanced across dyads.

Whenever the subject child chose to open the chamber containing the bribe, E2 immediately called for the partner child and secretly gave additional beads to her. That way, the partner child stayed happy and clueless about the bribery of the subject child. Neither E1 nor E2 commented or talked about the subject's choices, and E2 prevented the children from talking about the game while E1 set up the next trial. The children were not given any information about how many trials they were to play. E1 simply announced that there would be yet another trial by saying, "Okay, I'll hide beads again."

After the six test trials, a same-outcome test trial was completed. In this trial, the subject's forced-choice panel was baited with a single bead in one of the chambers and the rope in the other (thus making cooperation and defection equally rewarding).

Dictator game. After the last test trial, the subject children and E1 were alone in the test room, and the subject played a dictator game. E1 announced that she found five additional beads and that the subjects could divide them in any way they wanted by placing them on two plates (one for the subject and one for the partner).

After the dictator game, the partner child had a chance to add his additional beads from E2 into his bead collector. Then, without the children present, E1 made sure that both children would have the same number of beads in their collectors before calling them back in the test room to make their bracelets.

Coding and Reliability

In each trial, we recorded whether the subject accepted the bribe (opened the chamber containing the bribe instead of the chamber containing the rope) and the subject's allocation in the dictator game. All of the sessions were videotaped and coded by a primary coder. To establish reliability, a naïve coder who was blind to the conditions and the hypotheses of the study coded a randomly selected sample of 20% of the data in each condition. The two coders were in perfect agreement (Cohen's $\kappa = 1$).

Results

In the main analysis, we looked at the number of bribe rewards subject children accepted out of six test trials. The last test trial of two subjects' had to be excluded due to an apparatus failure. The generalized linear mixed model (Baayen, Davidson, & Bates, 2008) included condition, age, bribe value (high, low), the Condition \times Bribe Value \times Age interaction, gender and trial number as fixed effects, and dyad ID as a random effect. To keep Type I error rates at the level of 5%, we included random slopes of bribe value and trial number within dyad ID but not the correlation

parameters among the random intercept and random slopes terms (Barr, Levy, Scheepers, & Tily, 2013; Schielzeth & Forstmeier, 2009). To establish the significance of the effect of the test predictors as a whole, we ran a likelihood ratio test (Dobson & Barnett, 2008) comparing the full model with a null model (Forstmeier & Schielzeth, 2011). Overall the full model provided a significantly better fit compared to the null model, $\chi^2(12, N = 96) = 67.61, p < .001$. The three-way Condition \times Bribe Value \times Age interaction was not significant, $\chi^2(2, N = 96) = .89, p = .64$. Therefore, we dropped it from the analysis. The reduced model included condition, age, bribe value, the Condition \times Age interaction, the Condition \times Bribe Value interaction, the Bribe Value \times Age interaction, and gender as a fixed effect, as well as dyad ID and trial number as random effects. The reduced model was significantly better at explaining the data than was the null model, $\chi^2(10, N = 96) = 66.73, p < .001$.

Of most importance, we found an effect of condition, $\chi^2(2, N = 96) = 34.06, p < .001$, indicating that children resisted bribes more in both the implicit-commitment ($p < .001$) and explicit-commitment ($p < .001$) conditions than in the parallel-play condition (see Figure 2). Moreover, they resisted bribes more in the explicit-commitment condition than in the implicit-commitment condition ($p = .03$). This result suggests that preschool children already appreciate the force of joint commitments to collaborate and, in addition, a difference in force between explicit and only implicit joint commitments.

As can also be seen in Figure 2, the pattern was different at the two ages, and indeed there was a statistical trend toward an interaction of condition and age, $\chi^2(2, N = 96) = 5.37, p = .067$. The most obvious difference was that the 5-year-olds felt free to accept the bribe in the absence of a joint commitment (i.e., in the

parallel-play condition) almost twice as often as did the 3-year-olds. This might reflect their greater experience with joint commitments, such that their absence was both salient and significant. Bonferroni-corrected post hoc tests of the effect of condition separately for each age group revealed that 3-year-olds resisted bribes more often in the explicit-commitment than in the parallel-play condition ($z = -2.83, p = .004$) but did not distinguish between the implicit-commitment condition and either of the other two (see Figure 2 A). In contrast, 5-year-olds resisted bribes more often in both the implicit-commitment ($z = -3.49, p < .001$) and the explicit-commitment ($z = -4.22, p < .001$) conditions than in the parallel-play condition. Although the two commitment conditions did not differ from one another for the 5-year-olds, still it was the case that, unlike the 3-year-olds, the 5-year-olds clearly differentiated the condition in which there was only an implicit joint commitment from that in which there was no commitment at all.

We also found an effect of trial, $\chi^2(1, N = 96) = 10.79, p = .001$, indicating that children resisted bribes more over the course of the six trials ($z = -3.38, p < .001$), probably because obtaining even more beads became less interesting over trials. There was also a trend for an effect of gender, $\chi^2(1, N = 96) = 3.02, p = .08$, indicating that boys resisted bribes more than did girls ($z = 1.77, p < .08$). Furthermore, there was a significant Bribe Value \times Age interaction, $\chi^2(1, N = 96) = 4.49, p = .03$, such that 3-year-olds resisted bribes more often when they were of a lower value ($z = 2.20, p = .03$), and this effect was even more pronounced in 5-year-old children ($z = 4.36, p < .001$). Finally, the Condition \times Bribe Value interaction was not significant, $\chi^2(2, N = 96) = 1.71, p = .43$.

We were also interested in whether children preferred to work collaboratively with their partner child (choose the rope) or accept

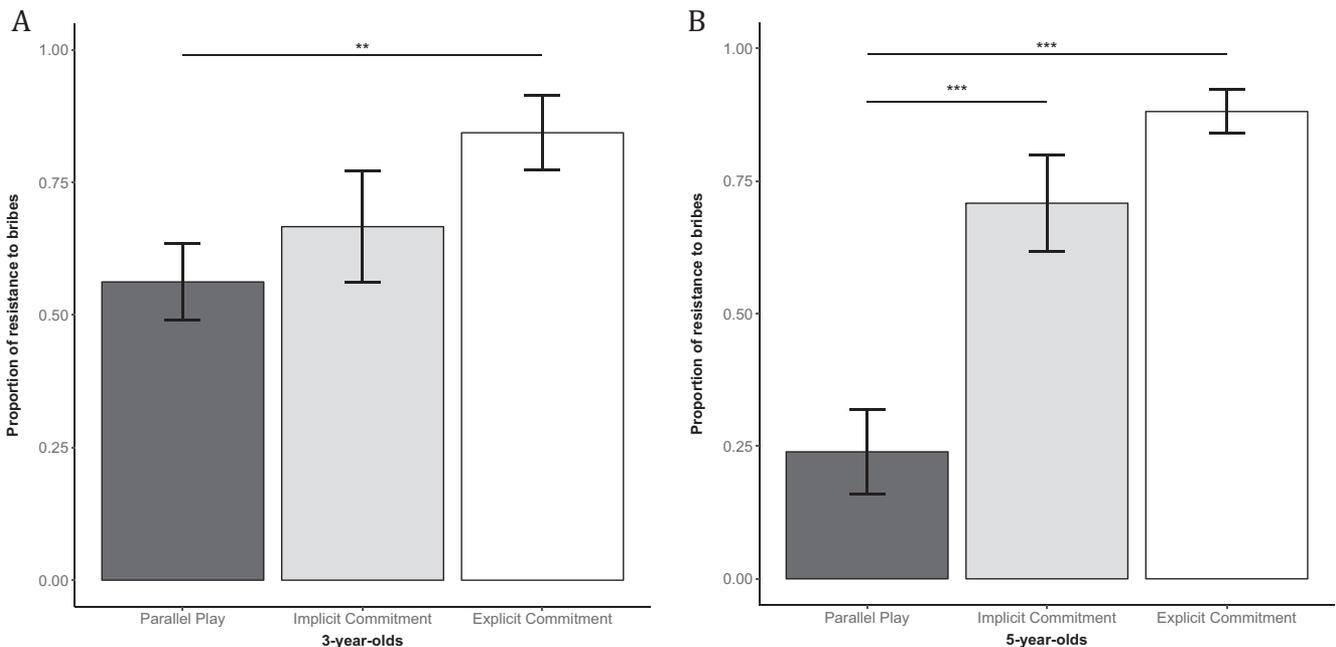


Figure 2. Proportion of trials in which 3-year-olds (Panel A) and 5-year-olds (Panel B) resisted the bribe across conditions. Error bars indicate standard error of the mean. We found a significant effect of condition ($p < .001$) in our model, and the Condition \times Age interaction was a trend ($p = .067$). ** $p < .01$. *** $p < .001$.

a bribe of the exact same outcome (choose the bribe) in the additional same-outcome test trial, because previous research has shown that children prefer collaborative over individual work if the outcome is the same (Rekers, Haun, & Tomasello, 2011). With either option, they would get one bead for themselves and, if they chose to pull collaboratively with the partner, one bead for their partner. Again, we analyzed the mean acceptance of the bribe reward, but here there was just one test trial. Three subjects had to be excluded from the analysis because they did not receive the same-outcome trial due to an apparatus failure. To model the impact of condition, age, and gender on children's acceptance of the same-outcome bribe, we used a generalized linear model with binomial error structure and logit link function (McCullagh & Nelder, 1989). The full model did not provide a significantly better fit compared to the null model, $\chi^2(4, N = 93) = 62.69, p = .29$. Thus, none of the test predictors had an obvious effect on the acceptance of the one-bead bribe. To test whether children's choices for either option were above chance, we ran one-sample t tests for each condition separately with the chance level set to 1/2. As hypothesized, children's resistance of the bribe was above chance in all three conditions: implicit-commitment condition, $t(30) = -5.04, p < .001$; explicit-commitment condition, $t(30) = -14.50, p < .001$; and parallel-play condition, $t(30) = -5.04, p < .001$. This suggests that, for the same reward, children of both ages preferred collaboration to individual effort—making sure that their partner would end up with one bead instead of nothing. In line with Rekers et al. (2011), even in the parallel-

play condition subjects preferred to work collaboratively instead of individually for the same outcome (see Figure 3).

Finally, we were interested in how children would allocate five additional beads that were handed to them after the game was over. We counted how many of those five beads children kept for themselves and used a GLM with Poisson error structure and log-link function (McCullagh & Nelder, 1989) for the analysis. We analyzed whether condition, age, gender, and children's bribe-accepting behavior in the previous test trials influenced their allocation. The full model did not provide a significantly better fit compared to the null model, $\chi^2(4, N = 96) = 33.21, p = .96$. Thus, none of the test predictors had an obvious effect on children's allocation of the additional beads. Visual inspection of the data shows that most children either kept all five beads for themselves or kept three beads and gave two beads to their partner (see Table 1).

Discussion

The most general result of the current study was that when preschool children make a joint commitment with a peer to collaborate, their sense of commitment is strong enough that they resist fairly strong selfish temptations to break it. It is conceivable that what the children were demonstrating was not a sense of commitment but rather a simple preference: the explicit-commitment and implicit-commitment conditions were so much fun that children preferred continuing to collaborate in them rather

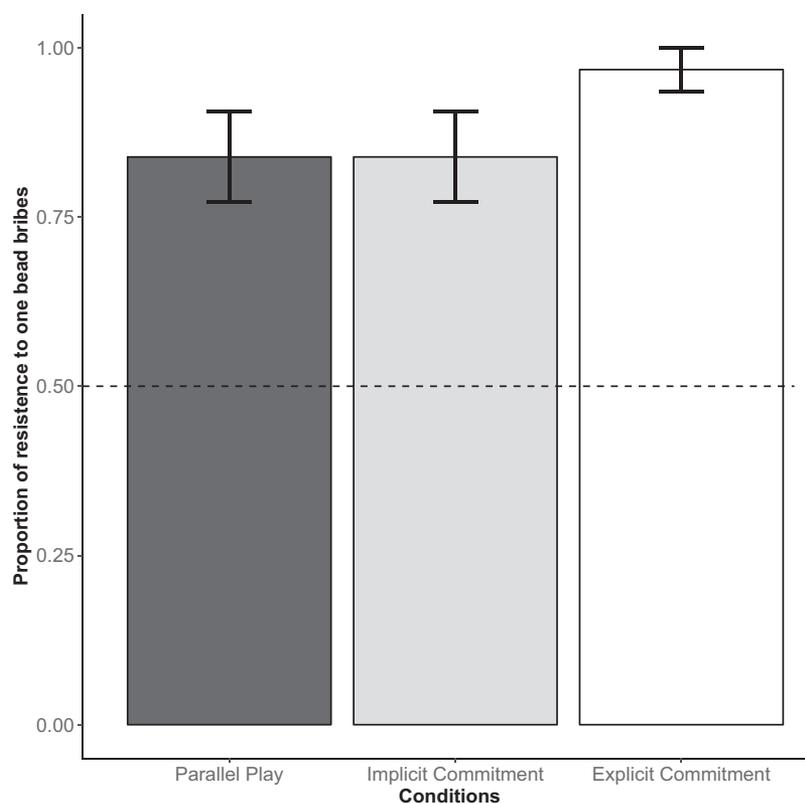


Figure 3. Subjects' resistance to one-bead bribes as a function of condition. Error bars indicate standard error of the mean. The dotted line indicates chance level.

Table 1
Distribution of Children Who Kept One–Five Beads for Themselves in the Dictator Game as a Function of Age

Group	No. of beads				
	1	2	3	4	5
3-year-olds					
<i>n</i>	0	7	18	1	22
%	0	14.58	37.5	2.08	45.83
5-year-olds					
<i>n</i>	0	6	24	2	16
%	0	12.5	50	4.17	33.33

than take the selfish option (whereas the parallel-play condition was not as much fun). However, the current study was designed to be highly similar to other studies (e.g., Kachel et al., 2018), and in those studies children objected to partner defections with normative language such as *You must not do it this way* and *You have to do it that way*. Our assumption here, then, is that children are assessing their own potential defection in this same normative way and, in some cases, deciding that they should not defect. This interpretation is also consistent with findings in other studies of children in this same age range who protested, using normative language, when others broke rules (see Schmidt & Tomasello, 2012, for a review), or who felt guilt when they themselves carelessly caused harm to others (Vaish, Carpenter, & Tomasello, 2016), or who gave up resources in their possession (which they otherwise would not have given up) to a collaborative partner to achieve a just distribution of the spoils (Hamann et al., 2011).

In addition, the preference explanation cannot account for the difference between the explicit-commitment and implicit-commitment conditions. These conditions were identical except for the explicit joint commitment itself, and so their “fun value” should have been identical. But, in the overall sample, children resisted bribes better in the explicit-commitment condition, perhaps suggesting that the explicit joint commitment somehow felt more binding to them. In the adult literature, the proposal is that making an explicit joint commitment effectively prevents one from pleading ignorance and making the excuse that one didn’t realize there was a commitment (as one can more plausibly do in the case of an only implicit commitment; Pettit, 2018). Indeed, one could think of written legal contracts as simply one further explicit step along the lines of making sure that there is no misunderstanding about the content of the agreement.

Differences between 3-year-olds and 5-year-olds in the study were not large but were nevertheless detectable. Inspection of the graphs reveals that the main difference was that 5-year-olds were much quicker to take the bribe when there was no joint commitment (i.e., in the parallel-play condition) than were the 3-year-olds. Two explanations suggest themselves. One is that the 3-year-olds simply found the independent rope-pulling game in the parallel-play condition more fun than did the 5-year-olds, such that they ignored the bribes (whereas the game requiring both partners—in the two commitment conditions—was equally fun for both ages). The other possibility is that 3-year-olds are kind of “promiscuous normativists” (Schmidt & Tomasello, 2012), such that anytime they are playing next to one another, even if it is in parallel, they see it as a kind of collaboration with an implicit commitment,

whereas 5-year-olds differentiate more clearly among collaborative interactions based on how they are initiated. The reason that 5-year-olds differentiate types of social interaction more clearly than do 3-year-olds, on the current hypothesis, is that they have had much more experience collaborating and making joint commitments on their own with peers. And peer experience—for example, being abandoned by a partner on whom one depends—is crucial for understanding the importance of explicit joint commitments, which are designed precisely to prevent such defection. In a related vein, because 5-year-olds, but not 3-year-olds, are actively concerned about their reputations with others (Engelmann, Herrmann, & Tomasello, 2016; Piazza, Bering, & Ingram, 2011), perhaps they are more highly motivated to discover what actions have ramifications for their reputations and which, like those in the parallel-play condition, do not.

At first glance, the findings with 3-year-olds might seem to conflict with those of Hamann et al.’s (2011, 2012), who found that simply entering into a collaboration with a peer partner (an implicit commitment) led children to help their partner more and share with the partner more than did parallel play. Arguably, however, such helping and sharing in the context of an ongoing collaboration are easier for children than is resisting material rewards for opting out, as in the current study. In addition, it is important that in those previous studies children helped or shared with their partner, either more or less, after the collaboration was already ongoing, whereas in the current study the child’s decision was about whether to collaborate at all—arguably a much weightier decision.

A further step along this same developmental path might be for children to make joint commitments spontaneously, and they do so on some occasions with such interactions as “Let’s do X” and “Okay.” But in point of fact they do not make such explicit joint commitments so frequently (Melis & Warneken, 2016). This may be because explicit joint commitments are necessary only when (a) partners depend on one another in important ways such that defection causes harm and (b) there is some question about whether partners will be motivated enough to persist through distractions and temptations to defect. In play interactions, which are the main form of interaction in young peers, the interdependence is not so great, in the sense that defection does not cause great harm. Alternatively, it simply may not occur to young children, especially in the preschool period, that peers might change their preferences in the middle of their social interaction.

Along these lines, one could argue that because an adult orchestrated the explicit joint commitment in our study, the children felt committed not only to the peer partner and their joint play but also to the adult who arranged their consent to play together—and this contributed to our results. This is possible, but to tone down her role in the process the experimenter initiated things in a playful manner and also reminded children before each trial that they could choose whichever chamber of the forced-choice panel they wanted—and left the room before the collaboration began. Also, previous research on children’s understanding of joint commitments where the adult arranged nothing (e.g., Gräfenhain et al., 2009; Hamann et al., 2011, 2012) have shown that “pressure” from an adult is not necessary for the children to feel a commitment to their peer partner. In either case, an interesting future line of research might be to see the conditions under which young chil-

dren are motivated to make spontaneous and explicit joint commitments.

Finally, we observed that children's bead allocation in the dictator game was not influenced by any of our test predictors. The majority of children in our study kept three or all five additional beads for themselves. This pattern is in line with previous work on children's behavior in the dictator game (Benenson, Pascoe, & Radmore, 2007; Blake, Corbit, Callaghan, & Warneken, 2016). Although collaboration reduced children's tendency to accept the bribe in the pulling game, there was no increase in sharing the additional windfall beads afterward, even though the resource and the partner were the same. A study by Corbit, McAuliffe, Callaghan, Blake, and Warneken (2017) found that 5-year-olds start to reject disadvantageous resource distributions after collaboration (and even advantageous resource distributions starting between 7 and 8 years of age). However, the shared resources in their study were the ones obtained during the collaboration, whereas in our study they were additional beads from the experimenter.

The current results thus contribute to a growing body of work that at around three years of age, young children take what may be called a normative turn. It is at this age that they begin to enforce social norms on others (Schmidt & Tomasello, 2012). It is at this age that they begin to have a sense of fairness in the division of spoils after a collaborative activity (Hamann et al., 2011). And it is at this age that they begin to use normative language like *ought*, *must*, and *should*, perhaps especially when protesting against moral and conventional violations (Köymen et al., 2014; Rakoczy, Warneken, & Tomasello, 2008; Wyman, Rakoczy, & Tomasello, 2009). This normative turn indicates that young children have begun to enter into a new world in which the question is not just what someone is thinking or doing but rather what the person should be thinking or should be doing in the eyes of the larger social community.

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