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Preschoolers Are Able to Take Merit Into Account When Distributing Goods

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Abstract

Classic studies in developmental psychology demonstrate a relatively late development of equity, with children as old as 6 or even 8–10 years failing to follow the logic of merit—that is, giving more to those who contributed more. Following Piaget (1932), these studies have been taken to indicate that judgments of justice develop slowly and follow a stagelike progression, starting off with simple rules (e.g., equality: everyone receives the same) and only later on in development evolving into more complex ones (e.g., equity: distributions match contributions). Here, we report 2 experiments with 3- and 4-year-old children (N = 195) that contradict this constructivist account. Our results demonstrate that children as young as 3 years old are able to take merit into account by distributing tokens according to individual contributions but that this ability may be hidden by a preference for equality.

Keywords

fairness, cooperation, development, morality, equity

Disciplines

Child Psychology | Developmental Psychology | Experimental Analysis of Behavior | Social Psychology

Preschoolers are able to take merit into account when distributing goods

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Abstract

Classic studies in developmental psychology demonstrate a relatively late development of equity, with children as old as 6 or even 8 to 10 years failing to follow the logic of merit—that is, giving more to those who contributed more. Following Piaget, these studies have been taken to indicate that judgements of justice develop slowly and follow a stage-like progression starting off with simple rules (e.g., equality: everyone receives the same) and only later on in development evolving into more complex ones (e.g., equity: distributions match contributions). Here, we report two experiments with 3- and 4-year-old children (N = 195) that contradict this constructivist account. Our results demonstrate that children as young as three years old are able to take merit into account by distributing tokens

according to individual contributions but that this ability may be hidden by a preference for equality.

Keywords: Fairness; Cooperation; Development; Morality; Equity.

Word Count: 4426

Preschoolers are able to take merit into account when distributing goods

Justice can be at the same time very simple and very complicated (Sandel, 2010). It is simple because it amounts to distributing resources in a fair way, not giving advantage to anyone (Rawls, 1971). It is complicated because being fair often involves taking into account a vast array of parameters (efforts, needs, investments, etc.) that are difficult to evaluate and quantify. Moreover, the very same logic of fairness can lead to different distributions. When individuals are in the same position, for instance because they have equally contributed to the production a common good, equality may be the fairest way to distribute resources. By contrast, when individuals are in different positions, for instance because one of them has contributed more, being egalitarian may amount to favoring the one who contributed less (by offering them a better "rate of return" from their work). Thus, if people want to be fair, they sometimes ought to give more to the ones who contributed more.

The difficulty of implementing fairness in the real world is probably the reason why, following Piaget (1932), judgements of justice have long been thought to emerge very gradually and to follow a stage-like progression from irrelevant rules (such as giving according to one's own preferences) to simple rules (such as equality: everyone gets the same) to more complex ones later on in development (such as equity: distributions match contributions). In line with this approach, classic studies demonstrate a relatively late development of equity, with children as old as 6 or even 8 to 10 failing to follow the logic of merit, i.e., failing to give more to those who contribute more (e.g., in tasks involving the distribution of money after a common phase of artwork production) (Damon, 1975, 1980; R. D. Enright & Sutterfield, 1980; R. D. Enright et al., 1984; Kohlberg, 1969; McGillicuddy-de Lisi, Watkins, & Vinchur, 1994; Nelson & Dweck, 1977; C. Peterson, Peterson, & McDonald, 1975; Sigelman & Waitzman, 1991).

In the last decades, an alternative to this constructivist position has emerged. This approach draws from general accounts of fairness coming from evolutionary biology (Trivers, 1971), behavioural economics (Binmore, 2005) and moral philosophy (Rawls, 1971). In this framework, it is posited that humans are endowed with a a universal 'sense of fairness', an adaptation designed to regulate cooperative interactions (fro empirical evidence, see for instance Robinson, Kurzban, & Jones, 2006). Humans are indeed uniquely cooperative and, contrary to to great apes, obtain most of their ressources through collaborative interactions such as hunting, gathering, or exchanging goods and services (Kaplan, Hill, Lancaster, & Hurtado, 2000; Tomasello, 2009). In this highly cooperative context, recent evolutionary models have shown that fairness is the optimal strategy (André & Baumard, 2011, 2012; Chiang, 2010). Individuals are indeed in competition to be recruited in cooperative interactions and those who take a bigger share of common benefits are left out for more advantageous partners. This perspective allows for a better understanding of why merit is strongly valued by humans. If A invested three units of resources in the interaction while B invested only one, she then ought to receive a payoff exactly three times greater than B (otherwise B would benefit more from the interaction than A and A would be better off leaving for another partner). Distributing resources according to merit is thus the best way to share the benefits of cooperation in a mutually advantageous way.

Although evolutionary theories do not contradict the idea of a progressive development of justice judgments, they render the idea of an early development of complex judgments of justice more plausible (the same argument hold for a variety of domains, see for instance the case of numbers, Dehaene, 1997; for a general discussion, see Barkow, Cosmides, & Tooby, 1992; Bloom, 2004; Pinker, 1997). Indeed, the idea that humans are predisposed to develop a sense of fairness is at the heart of this approach. Such a predisposition might help children to overcome the complexity of judgments of justice from

an early age. In line with this idea, recent experiments using looking time measures have shown that 12 to 18 months old infants are sensitive to inequity (Geraci & Surian, 2011; Schmidt & Sommerville, 2011; see also LoBue, Nishida, Chiong, DeLoache, & Haidt, 2011). When actively involving involved in the task, children as young as 3 years old share mostly equally after having worked together to obtain rewards in a collaborative task, even when those rewards could easily be monopolized (Warneken, Lohse, Melis, & Tomasello, 2011; see also Blake & Rand, 2010). Moreover, as a follow-up study demonstrated, sharing is clearly related to the collaborative nature of the task: 3-year-olds share with others much more equitably in these contexts than they do in either windfall or parallel-work situations (Hamann, Warneken, Greenberg, & Tomasello, 2011).

Taken together, these studies suggest that fairness, i.e., the ability to share the benefits of social interactions in a mutually advantageous way, may be present very early in ontogeny. A finer test would be to study whether children are able to match contribution and distribution in order to maintain fair interactions with their partners. So far, however, evidence for such an ability have been lacking. What may have prevented previous research from identifying such complex judgments of justice, we argue, is that experiments were often overly demanding for young children. To single out a representative example, consider the following scenario: children are told a story about a group of three characters making clay pots together. Each character is associated with identifying characteristics: one is the oldest, one is poor, and one is the most productive. Ultimately, the clay pots are sold for $9 and the child is asked to state the number of dollars each character should get (taken from Sigelman & Waitzman, 1991). Here, young children are likely to have struggled with the fact that numerous tokens need to be manipulated and that the whole situation is not very familiar to them.

In more recent studies reporting a late development of equity children were directly affected by the distribution, which may have biased them to serve their own interests. In Fehr

et al. (2008) for instance, children as old as 7 were reluctant to distribute tokens equally when they had the option to get more for themselves (see Rochat & Dias, 2009 for a similar problem). Young children may find it difficult to be moral when there is a cost for themselves (Moore, 2009; Thompson, Barresi, & Moore, 1997).

In the two experiments presented here, children were told a story about two characters who decide to bake cookies together. One gets tired, stops working and starts to play. The other character agrees to continue cooking whilst declaring that it is hard work. Eventually, the cookies are done and children are asked to distribute them. This task addresses the concerns discussed above. First, there are only two or three tokens to distribute and the scenario is extremely simple. Moreover, the answer is behavioural rather than verbal, which is less challenging for young children. The experimenter gives some fake cookies and children manipulate them themselves. Second, the child has no personal interest in the outcome of the distribution. Finally, adult interference is reduced to a minimum and the child is encouraged to rely on her own interpretation of the situation.

In Experiment 1, we examine whether children are able to take merit into account. Children have to distribute a small cookie and a big cookie. Two options are thus available to them: giving a big cookie to the greater contributor (and a small cookie to the lesser contributor) or giving a big cookie to the lesser contributor (and a small cookie to the greater contributor). Although none of these choices is ideal (since the big cookie is much bigger than the small cookie), we reasoned that if children understand merit, they will consider that favouring the big contributor is the ‘least bad’ solution. This forced choice scenario, however, gave us no access to children’s ideal choice. It may be the case that children are able to take merit into account but prefer egalitarian distributions in particular situations (in our scenario, for instance, they might think that although the character who worked more has slightly more rights over the cookies, this does not warrant an unequal distribution). In Experiment 2, we

relaxed the constraints placed on the distribution by allowing children to distribute three cookies of equal size as they wished. If children prefer equality in our scenario, they should give each character one cookie and not distribute the third cookie. In a second phase of the experiment, we asked children to distribute the remaining cookie(s) thereby allowing them to make use of their *capacity* to take merit into account in spite of their potential *preference* for equality.

Experiment 1

Preschoolers are presented with a typical situation of distributive justice involving varying levels of contribution. We predict that children will favour the big contributor over the small contributor and distribute the tokens accordingly.

Experiment 1

Method

Participants. 121 preschoolers were tested: 35 took part in pretest 1 (*Mean age* = 48.1 months; range 36 – 58, 13 girls), 35 took part in pretest 2 (*Mean age* = 48.1 months; range 38 – 60, 14 girls) and 51 took part in the test (*M* = 50.3 months; range 36 – 58). Children in the test phase were divided in two age groups: 3- to 4-year-olds (*n* = 20; *M* = 44.1 months; *SD* = 3.5; range 38–48; 11 girls) and 4- to 5-year-olds (*n* = 31; *M* = 54.3 months; *SD* = 3.1; range 48–60; 12 girls). Data regarding ethnicity were not collected. To keep the sample homogeneous in term of socioeconomic background, recruitment was restricted to middle class school catchment areas in Paris and Lyon (France), and excluded private schools (which typically enrol families with higher SES) or ZEP schools (which enrol students living in the 10% poorest catchment areas). Head teachers were contacted over the phone by one of the

experimenters and sent general information about the study and procedures if they were interested in taking part. The school administration then sent an information sheet and consent form to every parent of a child in the targeted age group. Data for each experimental phase (pretest 1, pretest 2, test) were collected sequentially and a given test phase only started when data collection for the previous phase had been completed (note also that children in a given school were allocated to the same experiment or pretest, hence the slight variation in sample size across experiments and pretests).

Material and procedure. Participants were tested individually in a quiet room they were familiar to and close to their own classroom. In the test phase, the experimenter introduced the characters of the story, saying: *See, this is Amélie, and this is Hélène. Amélie and Hélène are very good friends. Can you show me Hélène? Can you show me Amélie? Good! Bravo!* The experimenter then ensured that the child had memorized their names by asking her to point to Amélie (right) and to Hélène (left) (see Figure 1, picture 1). The experimenter then showed picture 2 and said: *Today, Amélie and Hélène have decided to bake cookies. See, they're in the kitchen, they're making cookies! After a little while, Hélène is bored of making the cookies. Amélie says: "Yes, it's tiring to bake cookies but I'm OK to finish on my own."* The experimenter then showed the third picture and said: *Hélène goes to play with her doll. Yeepee! It's fun to play dolls!* At this point, the first control question was asked: *Does Hélène find it fun to play dolls?* If the child provided the correct answer, the experimenter then proceeded to the fourth picture, saying: *In the meantime, Amélie is finishing the cookies. She says: "Phew!! This is such hard work! It's so tiring to make these cookies!" Amélie is working really hard*, and the second control question was asked[1]: *Does Amélie find that it's a lot of work to bake the cookies?* If the correct answer was provided, the experimenter showed the final picture and said: *That's it! Amélie is done! The cookies are*

[1] If the child did not provide the correct answer, she was prompted again.

ready! Mum says: "You can each have a cookie". She puts two cookies on a plate. There is one small cookie and one big cookie. Hélène and Amélie both want the big cookie. Is it better to give the big cookie to Amélie or to Hélène? Picture 1 was presented again and the child answered the test question either by naming the character or by pointing to her picture. After the child had made her choice, she was explicitly asked to justify her answer. To do so, the experimenter asked "*Why?"* after the child indicated whether it was better to give the big cookie to Amélie or to Helène. Justifications mentioning the characters' respective levels of contribution were considered correct (e.g., "because Amélie prepared more of the cake"). Other justifications (e.g., "because she has a big mouth") or absence of justification ("don't know" or silence) were coded as incorrect. A second coder classified the children's justifications. Agreement between coders was 100% in Experiment 1 and 2.

Pretest 1. In order to ensure that children had no *a priori* preference for Amélie or Hélène, the experimenter asked the children to distribute the cookies after having seen the first picture only. The experimenter followed the same procedure for picture 1 and then went straight to the distribution phase.

Pretest 2. To check that children did not give the big cookie to Amélie for reasons unrelated to justice, we ran another pretest where we presented picture 1 and then explained that Hélène was playing dolls (picture 3) and Amélie was cooking (picture 4) but where no justice-related information was provided. Children were then asked to distribute items unrelated to both activities (i.e. a small gift-wrapping and a big gift-wrapping). This allowed us to make sure that children did not give the big cookie to Amélie because they favoured the activity she was associated with (cooking *vs.* playing dolls) or because she was displaying facial signs of effort. We used the same script as in the test except for the final picture: *Mum brings two gifts. There is one small gift and one big gift. Hélène and Amélie both want the big gift. Is it better to give the big gift to Amélie or to Hélène?*

Please Insert Figure 1 about here

Results and discussion

Note that all *p*-values assume a two-tailed test.

Pretest 1. When presented with picture 1 on its own, children ($N = 35$; $M = 48.1$ months; range 36 – 58) were just as likely ($p = 1.00$, two-choice binomial) to give the big cookie to Amélie ($n = 18$) and Hélène ($n = 16$). This indicates that children had no *a priori* preference for Amélie.

Pretest 2. Fourteen children gave the big present to Amélie and 21 gave it to Hélène, which is not different from chance ($p = 0.31$, two-choice binomial). This suggests that children did not give the big cookie to Amélie because they favoured the activity she was associated with (cooking *vs.* playing dolls) or because she was displaying facial signs of effort.

Test. Thirty-eight children out of 51 gave the big cookie to Amélie (the girl who had contributed more), a distribution different from chance ($p = .002$, two-choice binomial, $OR = 2.92$) and from the one observed in both pretests (pretest 1: $\chi^2(1) = 4.22$, $p < .05$, $OR = 2.60$; pretest 2: $\chi^2(1) = 10.34$, $p < .005$, $OR = 4.38$). Analysis in each age group confirmed this result: 15 3-year olds out of 20 ($p = .04$, two-choice binomial, $OR = 3$) and 23 4-year olds out of 30 ($p = .01$, two-choice binomial, $OR = 3.29$) chose to give the big cookie to Amélie. A chi-square test revealed no difference between the age groups, $\chi^2(1) = .004$, $p = .95$, and also no significant impact of the child's sex or child sex on the distribution pattern, $\chi^2(1) = 2.9$, $p = .09$. Children's justifications were also analysed. Overall, 11 children provided correct justifications: 1 out of 20 in the group of 3-year olds and 11 out of 31 in the group of 4-year olds. Note that though there was a marked increase in children's capacity to justify their

judgments (p = .017, Fisher's test, OR = 10.45), most 4-year olds still struggled to provide accurate explanations for their choices. It is interesting to note that such a gap between judgments and justifications is also commonly reported in the adult literature and suggests that moral judgments are independent form language (Haidt, 2001; Hauser, Cushman, Young, & Jin, 2007).

In sum, preschoolers appear to be able to take the characters' respective contributions into account by giving more to the one who played a bigger role in the production of a common benefit. This result shows that children are able to understand merit and come up with an equitable solution much earlier than previously thought (e.g. Damon, 1980; McGillicuddy-de Lisi, et al., 1994). It is important to note, however, that our forced choice scenario tells us nothing about children's ideal choice: Since the cookies had different sizes, children had no way of expressing a preference for an egalitarian solution. What Experiment 1 allows us to conclude is that young children are *able to* take merit into account, not that this is their *preferred* option. In Experiment 2, we relaxed the constraints placed on the distribution to have access to young children's spontaneous preferred option in a similar situation.

Experiment 2

We used the same story structure as in Experiment 1, but this time three cookies of the same size were available for distribution. Children were offered all three cookies at once and had the opportunity to distribute them the way they wanted (with no further constraints imposed by the experimenter). Once they showed signs that they had completed the distribution, the experimenter recorded their initial distribution and, if relevant, prompted them to distribute any spare cookie. While remaining very simple, this design offers children a wider range of possible distributions including that of distributing the cookies equally. We predicted that some children would spontaneously favour equality but that beyond this

egalitarian response children would still think that the greater contributor has a right to slightly more than the smaller contributor.

Method

Participants. Seventy-five preschoolers were tested. They belonged to two age groups: 3- to 4-year-olds (n = 33; M = 42.7 months; SD = 3.4; range 34–48; 17 girls) and 4- to 5-year-olds (n = 42; M = 54.2 months; SD = 2.6; range 49–58; 19 girls). An additional 7 children were eliminated because they did not speak French (1), they refused to complete the whole experiment (4), or they failed to answer prompt questions (2).

Materials and procedure. The materials and procedure were identical to those used in Experiment 1 except for the final picture: *That's it! Amélie is done! The cookies are ready! Mum says: "You can have some!". She puts three small cookies on a plate. You can give cookies to Amélie and Hélène.* Picture 1, displaying Amélie and Hélène's faces, was shown again so that the children could distribute the cookies. We then waited 10 seconds or for a clear sign from the child that she had finished distributing (e.g., "I'm done"). The "initial" distribution was recorded at this point. If the child had not distributed all the cookies, the experimenter went on saying: *Well done! Very nice! Oh, look, there's some left. Who do you want to give it to? To Amélie or to Hélène?* (order of names counterbalanced) and repeated the procedure until all cookies were given out (children could thus distribute the cookies in one, two, or three steps). The "final" distribution was recorded at this point. The experimenter then asked the child to justify the distribution: *Oh! Look! Amélie/Hélène (depending on the child's distribution) has more! Why did she get more?*

Results and discussion

In what follows, we take three variables into account: i) who was given a cookie first, ii) children's initial distribution, and iii) children's final distribution.

59 out of 75 children gave the first cookie to the big contributor, which differs from chance, $p < .0001$, two-choice binomial, $OR = 3.69$ (27 out of 33 3-year-olds, $p < .0003$, two-choice binomial, $OR = 4.5$, and 32 out of 42 4-year-olds, $p < .001$, two-choice binomial, $OR = 3.2$).

Children's initial distribution was mainly egalitarian: 44 out of 75 children gave one cookie to each girl (17 3-year-olds, 27 4-year-olds, $p < .0001$ in both cases, nine-choice binomial, $OR = 11.35$). Among the 31 children choosing an unequal initial distribution, 26 favoured the greater contributor, which differs from chance, $p < .0002$, two-choice binomial, $OR = 5.2$ (14 out of 16 3-year-olds, $p < .005$, two-choice binomial, $OR = 7.0$ and 12 out of 15 4-year-olds, $p < .04$, two-choice binomial, $OR = 4.0$), with no difference between the age groups, $\chi^2(2) = 1.57$, $p = .46$. Interestingly, there was no difference between the mean age of the 44 egalitarian children ($M = 49.4$, $SD = 6.9$) and the mean age of the 26 children favouring the greater contributor ($M = 48.2$, $SD = 6.0$), $t(67) = .74$, $p = .46$, which suggests that equal distributions were not specifically favoured by the youngest.

Please insert Figure 2 about here

In the final distribution, the greater contributor was favoured by 56 children out of 75, $p < .0001$, two-choice binomial, $OR = 2.95$. This was confirmed when both age groups were considered separately, with 26 out of 33 3-year-olds, $p < .002$, two-choice binomial, $OR = 3.71$ and 30 out of 42 4-year-olds favouring Amélie, $p < .008$, two-choice binomial, $OR = 2.5$. Interestingly, all 4-year-olds chose to give two cookies to Amélie and one to Hélène and none decided to give all three cookies to Amélie. Amongst the 3-year-olds, 22 gave two cookies to

Amélie and one to Hélène, and only 4 gave all three cookies to Amélie. In line with Experiment 1, distributions were influenced neither by age group, $\chi^2(1) = .21$, $p = .65$, nor child's sex, $\chi^2(1) = .74$, $p = .39$.

We also analysed the behaviour of the 44 children who had been egalitarian in their initial distribution separately. When these children were encouraged to give the third cookie, 30 children favoured the greater contributor ($p < 0.03$, two-choice binomial, $OR = 2.14$), with no difference between the age groups ($\chi^2(1) = 0.74$, $p = .79$).

Finally, we analysed children's justifications following the same procedure as in Experiment 1 and found that a minority of children provided correct justifications (13 children out of 75, 2 out of 33 among 3-year olds and 11 out of 42 among 4-year olds). Again, there was a significant increase in children's capacity to justify their judgments with age ($p = .03$, Fisher's test, $OR = 5.5$).

Experiment 2 shows that, in Amélie and Hélène's story, children judge equality to be the best solution. Further evidence suggests that they still think that a greater contributor has a right to more of the stock of commonly produced tokens.

General discussion

In this paper, we demonstrate that children as young as 3 are able to take merit into account when distributing tokens. In Experiment 1, children consistently gave the biggest cookie to the biggest contributor, showing an ability to match contribution and distribution. To our knowledge, this is the first demonstration of a consistent understanding of merit and equity before the age of six (Damon, 1975, 1980; Enright, et al., 1984; Enright & Sutterfield, 1980; Kohlberg, 1969; McGillicuddy-de Lisi, et al., 1994; Nelson & Dweck, 1977; Peterson, et al., 1975; Sigelman & Waitzman, 1991). These results are in line with recent experimental findings demonstrating that more basic moral principles (e.g., equality) are also grasped early

on in development (Hamann et al., 2011; Warneken et al., 2011). In Experiment 2, children had the opportunity to be egalitarian and their modal response was to share one cookie with each recipient. When prompted to give the remaining cookie however, most children gave more to the harder worker.

These results go against previous theories predicting 1) a late development of equity and 2) a stage-like progression from simple rules (e.g., equality) to more complex ones (e.g., equity). On the contrary, we observed 1) that young children understand that the greater contributor has more rights than the lesser contributor over the tokens to be distributed and 2) that children may have an initial preference for equality while being able to take merit into account when prompted to.

Our studies thus enabled to disentangle children's *ability* to take merit into account from their *preferences*. Many previous studies had demonstrated that young children tend to distribute goods equally (Damon, 1975, 1980; Enright, et al., 1984; Enright & Sutterfield, 1980; Kohlberg, 1969; McGillicuddy-de Lisi, et al., 1994; Nelson & Dweck, 1977; Peterson, et al., 1975; Sigelman & Waitzman, 1991) but whether they were unwilling or unable to perform equitable distributions remained unclear. Conversely, our studies suggest that young children have the *ability* to be equitable, but may nonetheless *prefer* to distribute goods equally when they have the opportunity to do so.

There are a number of reasons why children might have preferred egalitarian distributions in these experimental settings (and in their initial distribution in Experiment 2), some of which may have nothing to do with equity: Children may find the egalitarian solution more salient; they may be trying to demonstrate that they have good counting skills and that they can split tokens equally; they may be assuming that the experimenter expects them to produce an egalitarian distribution, and so on. Alternatively, children may choose equality simply because it appears to them as the most equitable solution. After all, both Amélie and

Hélène contributed to baking the cookies, Amélie and Hélène are friends, Hélène went to play dolls with Amélie's approval, and the extra effort involved on Amélie's part is not that big. In other words, they may realise that Amélie has slightly more rights over the cookies, but the extra merit involved may not warrant going so far as to offer twice as many cookies (for a similar point, see Kenward & Dahl, 2011).

One limitation of the present studies is that they do not allow to disentangle these alternative interpretations. Therefore, characterising which contexts favour a spontaneous preference for equality will be an important route for future investigations. The adult literature suggests that in interactions with relatives or friends, people prefer egalitarian distributions (Clark & Mills, 1979; Deutsch, 1975; Fiske, 1992). In long-term relationships, it indeed makes sense to share things equally as individual contributions are likely to be roughly equalised in the long run. It would thus be interesting to manipulate friendship status or length of relationship in order to assess the influence of relationship status on children's judgments of fairness.

It would also be interesting to explore other factors known to influence judgments of fairness. For instance, previous studies on justice have shown that adults take into account talents, handicap and privileges (Cappelen, Sorensen, & Tungodden, 2010; Konow, 2003). Whether children also take these factors into account from very early on remains an open question. For instance, would they think that Amélie deserves more cookies if she has been more productive because her mother helped her or because she is older? Would they think that Amélie deserves more if she spends more time cooking even if she is eventually less productive than Hélène? What if Hélène had never helped in the first place and arrived as a Amélie's guest? What if they had worked equally hard on different tasks (e.g. one is baking cookies, the other is cleaning the drawing room)? The scope of these findings therefore remains limited and an important next step will be to further study which features are salient

to young children, under what conditions they are taken into account, and what are relevant mitigating factors influencing children's equity judgments.

Another limitation is that the study does not allow to understand the relationship between nascent intuitions of fairness and their impact on moral behaviour. Earlier studies have shown that children as old as 8 years old fail to forgo their own interests in order to distribute goods in a fair way. In our study, the participant was put in the position of being the impartial referee who has to make the call about fair-sharing. However, this context tells us nothing about what they would have done if they had had an interest in keeping some of the cookies to themselves. It is indeed conceivable that the developmental trajectory differs for moral intuitions and moral behaviour and that the former matures sooner than the latter.

Finally, how much the sense of fairness is innately predetermined and how much it is constrained by environmental or cultural factors remains an open question. Though most children this age spend a lot of time in a benevolent family environment and are rarely in a position to distribute the product of collective actions, they still have at least two years of experience engaging in social interactions involving collaboration and conflicts of interests: they have to share toys, take turns, help out, etc. (Ross, 1996). On the other hand, observations of children's everyday interactions highlight that children as young as two spontaneously produce complex judgments of justice (Dunn & Munn, 1987). Teasing apart the effects of innate dispositions, environment and culture therefore calls for further investigation. For instance, it would be interesting to assess the generalizability of our findings and compare the development of fairness in traditional societies where different norms and values are promoted.

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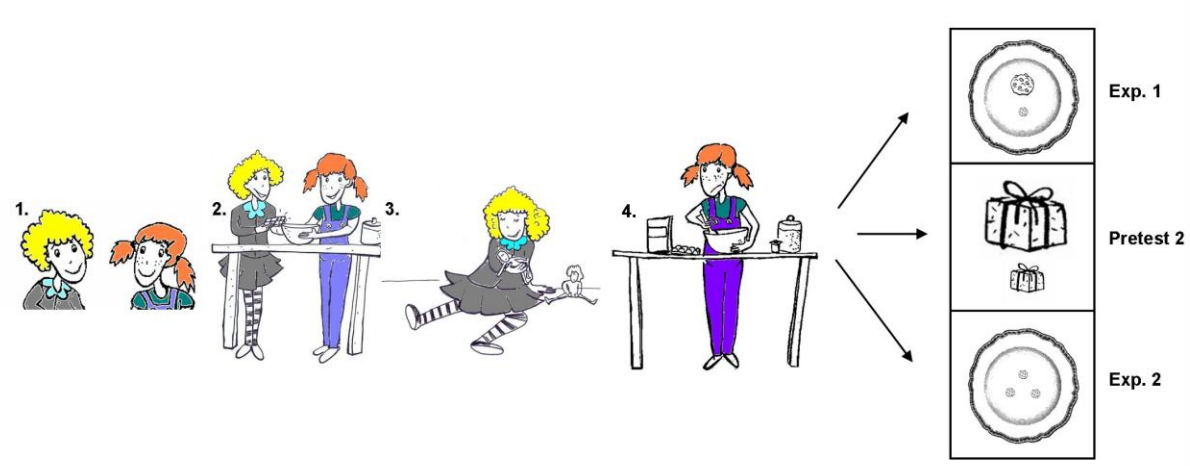

Figure 1. Pictures used in the Experiments 1a, 1b and 2.

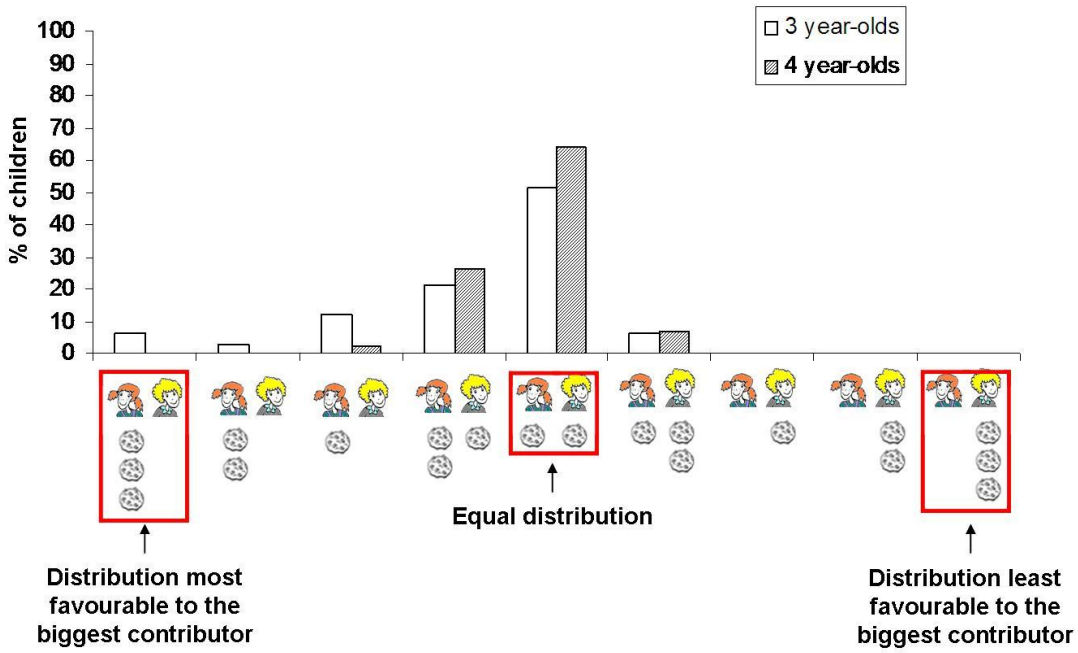

Figure 2. Pattern of initial distribution in 3- and 4-year-olds.