Knowing what I should, doing what I want: From selfishness to inequity aversion in young children's sharing behavior

Tehila Kogut *

Education Department, Ben-Gurion University of the Negev, Beer-Sheva 84105, Israel

ARTICLE INFO

ABSTRACT

The social utility model suggests that people feel more satisfied with equal divisions of resources than from inequitable outcomes, even when the latter favors oneself. Research examining children's behavior has shown that the tendency to share half of one's endowment increases with age between the ages of 3 and 8. However, the satisfaction the children derive from their decisions (to share half of their endowments) has yet to be examined. I present two studies (using the dictator and ultimatum games) suggesting that young children (5–6 years old) are aware of the norms of fairness but choose to act selfishly and prefer not to share. Slightly older children aged 7–8 adopt these norms in their actual behavior but do not feel happier when they share half of their endowments than when they share less than half. Finally, true inequity aversion only appears at the ages of 9–10, when children not only give more, but they correspondingly also feel better when their endowments are equally divided.

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1. Introduction

Unlike many applied economic models which suggest that people are motivated mainly by self-interest and will always seek to increase their material share in resource allocation situations, a large body of evidence gathered by experimental economists and psychologists during the last two decades indicates that a substantial percentage of the people are strongly motivated by other-regarding preferences and that concerns for the well-being of others, for fairness and for reciprocity, cannot be ignored in social interactions (Fehr and Schmidt, 2003). The dual concern model (Pruitt & Rubin, 1986) and the social utility model (Loewenstein, Thompson, & Bazerman, 1989) both suggest that in addition to the wish to maximize one's own utility, people tend to take the other's share into account in their allocation decisions. Social considerations such as reputation, norms, or concerns about the fairness of the allocation may have roles in these types of

decisions. According to the social utility model (Loewenstein et al., 1989), people feel more comfortable and experience greater satisfaction with the equal division of resources than with inequitable outcomes, even those in favor of oneself. Two main models describe the role of people's social preferences in economic interaction. Fehr and Schmidt (1999) social inequity aversion model, suggests that some people are inequity averse such that in addition to their material self-interest, their utility decreases if the allocation of material payoffs becomes less equitable. They argue that this type of response is essential in creating an environment in which bilateral bargaining can thrive. Inequity aversion and the rejection of injustice help to stable maintain co-operation and reduce opportunities for free riders. Similarly, Bolton and Ockenfels (2000) ERC (Equity, Reciprocity, and Competition) model characterizes how people trade-off material self interest with a preference for fair distribution and highlights the concern for one's relative position in people's social behavior. Indeed, those models are broadly consistent with observations of behavior in standard economic experiments including the dictator and ultimatum games.

1.1. Adults' behavior in the dictator and ultimatum games

Research into the dictator game provides further evidence for people's social concerns and fairness motives in resource allocation dilemmas. In this game, one player, the dictator (i.e., the allocator), decides how to distribute a fixed amount of money (the endowment) between him/herself and another participant, the recipient. Usually, both dictator and recipient are anonymous, meaning that neither knows the identity of the other. If individuals were concerned only about maximizing their own profits, the dictator would take all the money for him/herself and leave nothing for the recipient. However, research has shown that the dictators often allocate some share of the money to the recipients, thereby reducing the amount of money they receive. For example, 80% of the subjects gave positive amounts of money to their anonymous recipients in Forsythe, Horowitz, Savin, and Sefton (1994) dictator games (pie size = $10) while more than 20% of the allocators even split the money equally. This pattern of results was found to be stable with respect to various game manipulations (see Bolion et al. 1998; and a recent meta-analysis of the dictator game by Engel, 2010). Since the recipient in this game does not have a say and the players are anonymous, the only motivation the dictator has to share some of the endowment with the recipient is altruistic (in the sense that no materialistic reward is expected)[1]. Another game, often used to examine people's motives in resource allocation dilemmas is the ultimatum game, which adds strategic considerations to the allocation decisions.

As in the dictator game, in the ultimatum game one player (the allocator) still decides how to allocate the money between the two players, but the recipient can either accept or reject the allocator's proposal. In the event of recipient rejection, neither player receives anything, and if the recipient accepts, the money is split according to the proposal. Offers made in this game are systematically higher than in the dictator game (e.g. Charness & Gneezy, 2008; Forsythe et al., 1994, the no name condition). Specifically, no zero offers are made and an equal split (i.e., 50:50) is frequently the common offer (e.g. 75% in Forsythe et al. (1994)), while offers of less than 20% are often rejected (e.g., Guth & Tietz, 1990; Neelin, Sonnenschein, & Spiegel, 1988; Roth, Prasnikar, Okuno-Fujiwara, & Zamir, 1991). Because the allocators in this game are motivated by the wish to avoid the rejection of their offers—in addition to the altruistic or social motivations to share the endowment—their motivation to share is also strategic. Van Dijk and Vermunt (2000) compared allocations of chips in the ultimatum and dictator games for a situation in which the chips were worth twice as much to the allocator as they were to the recipient. They showed that when the recipients were unaware of the chips' differential values, allocators reduced their allocation offers in the ultimatum game but compensated for the value differential by allocating more chips to the recipient than to themselves in the dictator game. These results suggest that allocators participating in the ultimatum game wanted to appear fair to the recipients, while in the dictator game a concern for real fairness played a greater role, leading to a more altruistic decision.

1.2. Children's sharing behavior

In summary, research into the sharing behavior of adults suggests that people tend to share their endowments and feel better with an equal division (Loewenstein et al., 1989) even when no strategic considerations exist. Only a few studies in the last decade used the methods of behavioral economics to investigate sharing behavior in children (Gummerum, Hanoch, & Keller, 2008), showing that the proportion of children who allocated any resources at all increased with age (e.g., Blake & Rand, 2009). Second, although young children (age 3–4) showed some willingness to share resources, the preference for equal allocations did not emerge until 7 years of age or later (Benenson, Pascoe, & Radmore, 2007; Harbaugh, Krause, & Liday, 2003). For example, Fehr, Bernhard, and Rockenbach (2008) examined the allocation decisions of children between the ages of 3 and 8. They found that most children aged 3–4 behaved selfishly whereas most of those aged 7–8 preferred equitable resource allocations. In particular, their studies showed that 21% of children aged 3–4, 33% aged 5–6, and 60% aged 7–8 chose to allocate resources equally. Similarly, in the ultimatum game, younger children made and accepted smaller ultimatum proposals than did older children, but they exhibited especially strategic behavior in the dictator game, in which they proposed much smaller allocations than in the ultimatum game (Harbaugh et al., 2003).

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[1] Without earning the endowment and in cases where the proposer can also take and not only give to others, dictators are far less generous (see Bardsley, 2008; List, 2007; Oxoby & Spraggon, 2008).

1.3. The present research

Although the studies discussed above describe how children of different ages behaved while engaged in the two games, they do not reveal anything about the children's levels of satisfaction from their allocation decisions (i.e., to give or not to give). As mentioned earlier, according to the social utility model (Loewenstein et al., 1989), adults not only tend to allocate half of their endowments, they also feel more comfortable and experience greater satisfaction with equal rather than with unequal outcomes, even for allocation decisions that favor oneself. Thus, the main focus in this paper is not the children's behavior, but rather, whether they are satisfied with their behavior. For example, children may feel obliged to share their endowments, but in doing so, do they necessarily feel happy about it? My aim is therefore to examine when the preference for equal distribution develops in childhood by focusing on the children's levels of satisfaction from their decisions about whether to share. In addition, a comparison of the children's behavior in the dictator and ultimatum games will allow us to examine the children's awareness of the expectations of the other side, a measurement that reflects their perceptions of social norms.

Two studies, conducted in parallel at the same school, examined children from three age groups: kindergarten (aged 5–6), second grade (aged 7–8), and fourth grade (aged 9–10). Because my focus was on sharing decisions, both studies were restricted to the allocator's role in the game. In the first study, the willingness to share and one's level of satisfaction with the decision taken in the dictator game were examined. The second study analyzed the allocators' decisions and resulting levels of satisfaction in the ultimatum game.

In line with previous studies that investigated children's willingness to share, I predicted that the frequency of giving and the amounts given would increase with age. Specifically, I predicted that the percentage of children that would equally distribute their resources would increase with age (replication) as would the children's corresponding levels of satisfaction with the equitable split. Likewise, I expected younger children who chose to equally divide their resources to be less happy with their decision (driven by obligatory feelings) than children their age who decided to keep their entire endowments or who shared less than half. Finally, I expected younger children to feel happier when they kept everything for themselves and older children to feel unhappy when not sharing.

In addition, I suggested that the younger children (ages 5–6), although aware of the societal norms of equity and resource allocation, would choose to ignore these norms. Hence, I expected the younger children to share half of their endowments more often in the ultimatum game (where not sharing is costly) than in the dictator game. In contrast, I expected the difference between the frequencies of sharing in the two games to be smaller for the older children.

2. Study 1: the dictator game

The first study examined the above hypothesis about sharing behavior and one's resultant level of satisfaction with his/her sharing decision. Children from each of the three age groups played the allocator's role in the dictator game and were then asked to rate their levels of satisfaction with their decisions to share or not to share. In line with Fehr et al. (2008), in which in-group favoritism was shown to increase with age, participants from all three age groups were randomly assigned to either the in-group or the out-group condition by telling the child playing the role of allocator that the recipient came from either the same or a different class.

2.1. Method

One hundred and eighty-four children (49% of whom were females) studying in a school of average socioeconomic level in Israel participated in the study: 59 kindergarteners, 67 s graders, and 58 fourth graders. Male and female participants from each of the three age groups were randomly assigned to one of two experimental conditions vis-à-vis the task of the allocator: recipient from the same class vs. from another class. I used a face-to-face, one-on-one procedure to ensure that the children understood the task.

Four experimenters (all females) who were not aware of the objectives and hypotheses of the experiment were all employed in each of the age groups and experimental conditions equally. They played with and interviewed the children while following a structured protocol and using the same method. First, the experimenter introduced herself and asked for the child's name. Second, the experimenter showed the child ten jelly candies (popular among Israeli children) and told him/her that these ten candies would be divided between him/her and another child. Each child was told either that the other child was from the same class or from a different class depending on which experimental condition the child being interviewed had been assigned to. The experimenter explained to the child that which of the two children was to be given the job of dividing the candies would be decided by a lottery. The experimenter then hid a coin behind her back and asked the child to guess in which hand (left or right) the coin was. The child's "guess" was always correct (i.e., he/she always won the lottery and was given the job of allocator)[2]. The experimenter then told the child that since he/she won the lottery,

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[2] Since I examine only the allocator role in this research and given that some of the younger children are likely to give no candies to their partner, I avoided the disappointment of some of the children of receiving zero candies (or not being able to allocate any themselves) by assigning all of them to play the role of the allocator. This procedure also allows us to run the study faster and therefore reduces the possibility that the children will speak to each other about how they behaved in the game.

Table 1
Mean (SD) number of candies shared by the children and percentage of non-sharers (children who kept all the candies for themselves) and of equal-splitters in each of the three age groups (the dictator game – study 1; *N* = 182).

	Kindergarten *N* = 57	Second grade *N* = 67	Fourth grade *N* = 58
Number of candies shared	1.89 (2.06)	3.22 (2.10)	3.27 (1.90)
Percentage of non-sharers	47.4%	19.4%	13.8%
Percentage of equal-splitters	19.3%	41.8%	31%
Percentage of equal-splitters of the givers	37%	52%	36%

he/she would decide how to divide the candies and how many, if any, to give to the other child. The experimenter showed the child a sealed box and an empty envelope and instructed him/her to put the candies (if any) for the other child in the box and the candies that were for him/herself in the envelope (which he/she will take home). Before asking the child to complete the task, the experimenter asked two questions to confirm that the child understood the exercise. (Where will you put the candies that are for the other child? Where will you put the candies that are for yourself?) To prevent the experimenter's presence from influencing the outcome, the experimenter turned her back to the child until the child completed his/her task, including putting the box among the other identical boxes (all empty) and the envelope in his/her bag. This procedure ensured that the children would feel that their decision remains unknown to the experimenter. Next the experimenter showed the child a set of five faces representing five mood levels: very happy, happy, indifferent, sad, and very sad. Finally, the experimenter asked the child how he/she felt about his/her decision, describing each mood ("very happy, happy, indifferent, sad, or very sad") while pointing at the different faces. While asking the child to rate his/her feelings regarding the decision, the child knows that the experimenter has no idea what the decision was (since s/he had put the sealed box among other identical boxes). In fact, at this stage, the experimenter indeed had no idea what the decision was. This procedure helps to weaken possible social desirability (for example, children might feel that it is not appropriate to express happiness about being mean; or to be sad when being generous). Before being dismissed, the child was asked to understand that it is important that s/he kept the information about the experiment as a surprise for the other children until the experimenters were done working in the school and would not take out his/her candies until s/he gets home. After the child completed the task and returned to his/her class, the experimenter checked whether the child left any candies in the box for the other child, and if so, how many.

2.2. Results and discussion

2.2.1. Sharing behavior

Two of the kindergarteners failed to understand the instructions of the experiment (i.e., did not know where to put the candies for the other child or for themselves); they were given the candies and dismissed. The mean (SD) number of candies shared by the children in each of the three age groups and the percentage of children who gave any candies to the other child are presented in Table 1. Analyses of the number of candies shared with the other child (the recipient) according to age group (kindergarten, second grade, and fourth grade), recipient class (same vs. other class), and gender showed a significant main effect for age group [$F(2168) = 8.50$, $p = .001$], such that kindergarteners ($M = 1.89$) left significantly fewer candies than both second graders [$M = 3.22$; $t(122) = 3.68$, $p < .001$] and fourth graders [$M = 3.27$; $t(113) = 3.83$, $p < .001$]. No significant difference was found between the latter two groups. No other significant main effects or interactions were found. Specifically, no significant difference was found between dictators sharing with recipients from the same class or from other classes in none of the age groups. These results diverge from those of Fehr et al. (2008), who showed that the willingness to share with an in-group member increased with age, although the out-group in their study comprised children from another school as opposed to children from another class in the same school as in my study.

Comparing the percentage of "givers" (i.e., children who gave some of their candies to the other child as opposed to those who gave nothing) in each of the three age groups, I found that 47.4%, 19.4%, and 13.8% of the kindergarten second grade, and fourth grade children, respectively, took all the candies for themselves and did not leave any for the other child (Chi-square = 19.34, $p < .001$).

Finally, of the givers, the percentages of children who gave half of their candies to the other child did not significantly differ between the three age groups: 11/30 (37%), 28/54 (52%), and 18/50 (36%) of kindergarteners, second graders and fourth graders, respectively, from among the givers chose to equally divide their candies, demonstrating that even the younger children were aware of the social norms and adopted them once they decided to share.

#### 2.2.2. Children's levels of satisfaction with their allocation decisions

The children's responses to the question "how do you feel about your decision" were coded on a five point satisfaction scale ranging from −2 for the saddest face to 0 for the neutral face to +2 for the happiest face. Perhaps because they all received candies, none of the children chose either of the two sad faces. An ANOVA of satisfaction by age group, recipient class, and gender shows no significant relationships.

In order to examine the relationship between the number of candies given and the satisfaction children derived from their sharing decision in the different age groups, a regression analysis was conducted on the children's reports of their level of

Table 2
Expressed level of satisfaction from the decision not to give, to give less than half, or to give half of the candies, by age group (the dictator game – study 1; N = 182).

		Kindergarten N = 57	Second grade N = 67	Fourth grade N = 58
Non-sharers	Indifferent	2	1	0
	Happy	4	2	5
	Very happy	21	10	3
Sharers less than half	Indifferent	1	4	4
	Happy	6	4	11
	Very happy	12	18	17
Equal-splitters	Indifferent	1	1	0
	Happy	4	7	1
	Very happy	6	20	17
Significance		Chi-square = 2.94, P = .57, NS	Chi-square = 2.98, P = .56, NS	Chi-square = 14.09, P = .01
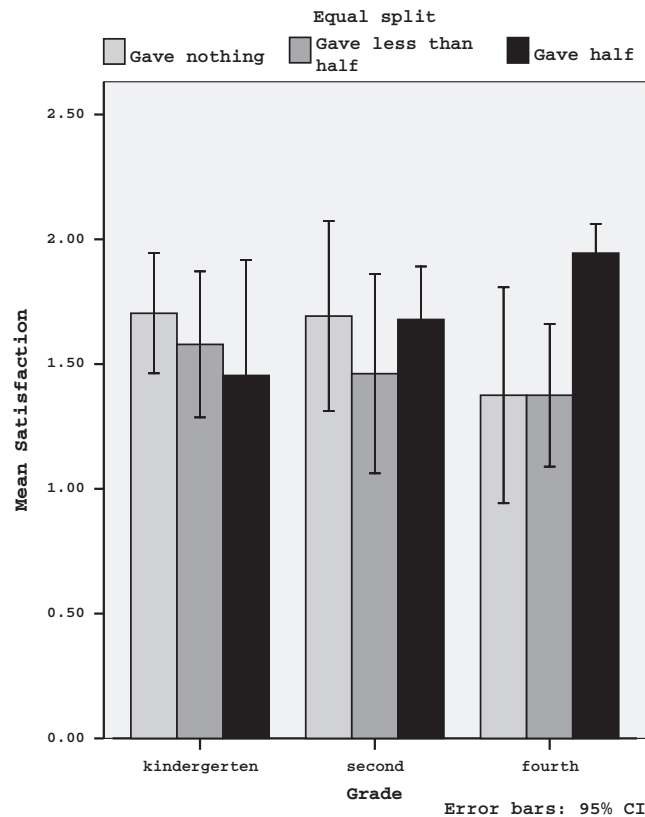
Fig. 1. Mean value on the satisfaction scale from the decision not to give, to give less than half, or to give half of the candies, by age group (the dictator game – study 1; N = 182).

satisfaction. The predictors were the number of candies given, grade and the interaction between these two variables. Results revealed a significant main effect for the number of candies shared (B = −.14, β = −.43, t = −2.13, p < .05) such that, overall, the children felt less happy when giving more candies. Most importantly, the interaction between age group and the number of candies given was also significant (B = .08, β = .63, t = 2.57, p < .01). A separate regression analysis on level of satisfaction by the number of candies given for each of the three age groups revealed a significant result only for the fourth grade participants (B = .12, β = .36, t = 2.66, p < .01), indicating that the more one shares, the greater his/her level of satisfaction.

In order to examine at which age the preference for the equal share emerges, I divided participants into three types of sharing patterns[3]: children who kept all the candies for themselves, children who chose an equal split and those that gave less

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[3] Five children gave more than half of their candies and were not included in this analysis (two fourth graders, who gave 7 and 8 candies and three second graders, who gave 6 candies each).

than half of their endowment (see Fig. 1). The interaction between age group and the sharing pattern in an ANOVA on level of satisfaction did not approach significance. However, separate analysis for each age group revealed significant results only for fourth graders, who expressed significantly greater satisfaction from their decision for an equal split ($M = 1.94$) than from both the decision to give less than half ($M = 1.37$) or to give nothing ($M = 1.37$)[4].

Finally, I compared the levels of satisfaction of the givers who chose to share half of their candies with those who gave less than half in each of the three age groups. An ANOVA on the satisfaction derived from the decisions of the givers only, based on age group and equitability of the division of candies (i.e., giving half vs. giving less than half), revealed a significant interaction between age group and the decision to split one's candies equally [($F(2, 128) = 5.06$, $p < .05$]. The satisfaction elicited from dividing one's candies equally increased with age. Children in kindergarten were slightly less satisfied when they gave half of their candies ($M = 1.45$) than when they shared fewer than half ($M = 1.58$, ns). Second graders were somewhat happier with an equal split ($M = 1.68$) than when they gave less than half ($M = 1.46$, ns). Finally, the fourth grade givers who shared half of their candies felt significantly happier ($M = 1.94$) than when they shared less than half [$M = 1.45$; $t(48) = 2.96$, $p < .01$; see Fig. 1][5].

Although I asked the children not to share their experience with the other children until the end of the experiment, I examine whether the children who participated later behaved differently than those who participated at the beginning of the experiment[6]. I divided each age group to children who made their choices relatively early on (first half), and those who made decisions later. An ANOVA on the number of candies shared by grade and the time of participation (first half of the experiment vs. second half) reveals no significant time effect $F(1176) < 1$, $p = .98$, nor significant interaction $F(2176) < 1$, $p = .48$. Similar results were obtained in an ANOVA on levels of satisfaction; both the main effects and interactions were far from significant.

I inquired the school's principals and the relevant classes' teachers and found neither specific educational programs that are related to sharing behavior, nor any change in the school's attitude to sharing as a social norm around these ages. This can partially rule out the possibility that the differences in sharing behavior or satisfaction from the decision found between the different age groups, is a result of such a direct intervention[7].

In summary, in addition to replicating previous studies showing that giving increased with age between the ages of 5 and 8, the results of the first study showed that the satisfaction derived from the decision increased with giving only for the older children. Kindergarten children and second graders' level of satisfaction was independent of giving. Only the older, fourth grade children expressed higher levels of satisfaction when sharing some of their candies with another child. Although children in the second and fourth grades did not significantly differ in their sharing behavior, only for fourth graders, giving some of their candies to another child led to greater satisfaction. More specifically, the results demonstrate that the tendency to feel better with an equal split (as suggested by the social utility model) emerged at the fourth grade level (about 9–10 years of age) when children tend to feel happier when they divide their candy supply equally than when they share less than half with another child.

The younger children's levels of satisfaction regarding sharing and decisions about sharing may stem from their lack of understanding of allocation norms such as equality or equity. On the other hand, the younger children may be well aware of what society expects from them based on social norms, but they still choose to do as they please (i.e., to keep all the candies for themselves) rather than what they should according to the norms. To further investigate the younger children's behavior, the second study was designed around the hypothesis that the younger children are aware of what is considered fair allocation, but they nevertheless choose to maximize their own shares even at the cost of violating social norms.

3. Study 2: the ultimatum game

The second study was designed to examine a situation in which violating social norms of sharing may be costly. I used the ultimatum game, in which one's offer may be rejected if perceived as unfair. I expected the younger children to share more in the ultimatum game than they did in the dictator game only if they were aware of norms of equality or equity. Children were expected to confront recipient rejection of unfair offers only if they understood what was considered a fair offer. In addition, younger children who increased giving only out of fear of losing their candies were expected to be less happy (i.e., as a result of their giving) relative to the older children who were expected to be driven by social utility and strategic considerations.

This study was conducted in the same school, around the same time, and by the same experimenters as the first study, but in different classes. Therefore, a comparison between the two studies is also available[8].

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[4] Results of a non-parametric test reveals similar results: the difference in the level of satisfaction was significant only for four graders, Chi-Square (4) = 14.09, $p < .01$ (see Table 2).

[5] Here too, a non-parametric test reveals similar results, such that level of satisfaction significantly differs between children who shared half of their candies and those who shared less than half only for fourth graders (Chi-Square (2) = 9.13, $p < .01$).

[6] I wanted to ensure that the children who participated later were not suspicious regarding the existence of their fictitious partner, or the truthfulness of the lottery that determined their role as allocators.

[7] To the best of my knowledge, sharing is encouraged in Israel as a social norm in informal ways all along childhood – at home, kindergarten and schools, and does not systematically vary by gender, social class or age.

[8] In order to minimize the possibility that the children from study 1 will share their experience with children from study 2, the experimenters asked the children in both studies not to talk about the "game" with their friends until they finish their work in the school; in order to keep it as a surprise. In addition, the fourth grade ultimatum study was run a few months later.
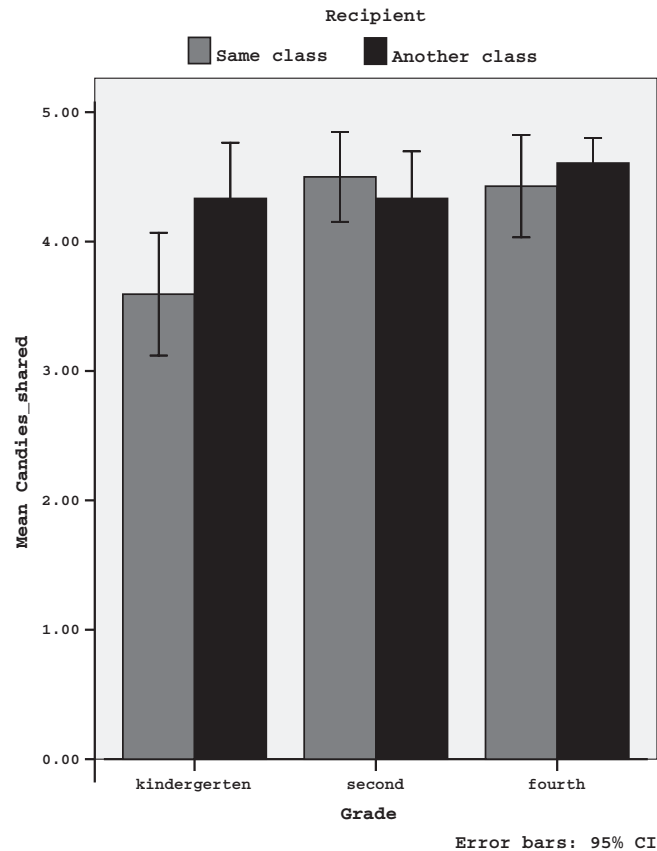
Fig. 2. Mean number of candies shared with the "other child" as a function of age group and recipient class (the ultimatum game – study 2, $N = 164$).

3.1. Method

One hundred and sixty-four children (49% of whom were females) participated in the study: 62 kindergarteners, 53 s graders and 49 fourth graders. As in the previous study, the children were randomly assigned to one of the two conditions: recipient from the same class or recipient from a different class.

The methodology was similar to that used in study 1. The experimenters worked separately with each child, who was allowed to win the ten candies at the beginning of the experiment. The child was then told that having won the lottery, he/she would decide how to divide the candies and how many candies, if any, to give the other child (i.e., the child was given the task of the allocator). The child was given a box and an envelope and was told how to use them when making his/her decision.

In contrast to the design of the first study, here the allocator was told that the other child (i.e., the recipient) would be able to accept or reject the offer of shared candies after being given the opportunity to view how many of the initial ten candies the allocator decided to share. The child was also told that should the other child accept the offer, each of them would receive his/her share, but if the other child did not agree, they would both receive nothing. Besides the two confirmation questions used in the previous study, I asked another question to ensure that the child understood the procedure: "How many candies will you receive if the other child does not accept your offer?" Two of the children (one from each age group) did not understand the procedure and were dismissed.

After the child was told that she/he had won the lottery, the experimenter turned her back on the child until he/she finished dividing the candies. Next the experimenter showed the child the set of five faces representing the five mood levels and asked him/her to point at the face that reflected the way he/she felt about the candy sharing decision. Finally, the experimenter went to another room for a minute, supposedly to ask the other child whether he/she had accepted the offer. In all cases, the experimenter returned to the child and told him/her that the other child had accepted the offer.

3.2. Results and discussion

3.2.1. Sharing behavior

The number of candies shared with the recipient ranged from 1 to 6 with an average of 4.27, SD = 1.03. A two-way ANOVA, by age group and by recipient class, on the number of candies given to the other child revealed a significant main effect

Table 3
Mean (SD) number of candies shared by the children and percentage of equal-splitters in each of the three age groups (the ultimatum game – study 2; $N = 164$).

	Kindergarten $N = 62$	Second grade $N = 53$	Fourth grade $N = 49$
Number of candies shared	3.96 (1.28)	4.42 (.89)	4.53 (.68)
Percentage of equal-splitters	39% (excluding 3 children who gave 6 candies)	58.5%	61.2%

for age [F(2158) = 5.05, $p < .01$], such that fourth graders ($M = 4.53$) and second graders ($M = 4.42$) shared significantly more candies than did the kindergarteners ($M = 3.96$). The former two did not significantly differ. Surprisingly, the interaction between age group and recipient class (i.e., belongs to the same class vs. another class) was also significant [F(2158) = 3.08, $p < .05$] (Fig. 2). While recipient class had no effect on sharing among the fourth and second graders, the kindergarteners shared more candies with recipients from a different class ($M = 4.33$) than with recipients from the same class ($M = 3.59$). A possible explanation for this finding is that unlike the older children, who saw their peers from the other class regularly and played with them in the school yard, kindergarteners (at least in the classes examined in the current study) interacted less frequently with other kindergarteners and were therefore less familiar with them. A more abstract target—in this case, unfamiliar kindergarteners—may be perceived as someone who is more likely to reject an unfair offer (care for fairness even at the cost of losing the candies offered). Likewise, the more familiar child may be perceived as more similar to oneself and as such, will accept any candy given to him/her (even at the cost of fairness). This assumption is in line with research suggesting that self/other discrepancies are enhanced as the other is more abstract and are reduced when considering a concrete target who is being judged as more similar to the self (e.g., Hsee & Weber, 1997). Further research is needed to examine how this assumption applies to children in different age groups and to adults (within the context of the rejection of an unfair offer).

Next I examined the percentage of equal splits (participants who gave half of their candies to the other child) in each age group (see Table 3)[9]. Among the fourth graders, 61.2% split their candies equally. Among second graders, 58.5% split their candies equally as opposed to 39% of the kindergarteners (Chi square = 6.57, $p < .05$). However, this difference in the percentage of equal splits interacted with recipient class: for recipients from another class, no significant difference was found between the percentages of children who offered equal splits (52%, 56.6% and 60.7% of kindergarteners, second graders and fourth graders respectively), (Chi-square < 1, $p = .80$). On the other hand, when the recipient and allocator belonged to the same class, only 28% of the kindergarteners offered half of their candies as opposed to 61.5% of the second graders and 62% of the fourth graders (Chi-square = 8.60, $p < .05$).

3.2.2. Interstudy comparison of sharing behavior

A two-way ANOVA by game type (dictator and ultimatum) and age group (kindergarten, second grade and fourth grade) on the number of candies given to recipients revealed a significant main effect for game [F(1340) = 75.12, $p < .001$], such that children in the dictator game gave fewer candies ($M = 2.77$) to the recipients than children in the ultimatum game ($M = 4.30$). The main effect for age was also significant [F(2340) = 13.53, $p < .001$], such that the older children shared more candies ($M = 3.89$ and $M = 3.82$ for the fourth and second graders respectively) than did the younger ones ($M = 2.89$). The interaction between age and game approached significance [F(2340) = 2.86, $p = .059$], showing that although children from both age groups increased the number of candies they each gave in the ultimatum game, this difference was greater for the kindergarteners than for the older children (see Fig. 3).

The comparative analysis of the two studies supports our assumption that younger children are aware of the norms of sharing and equality. The percentage of kindergarteners who gave half of their candy supply in the ultimatum game (vs. in the dictator game) and the difference between the number of children who equally divided their candy supply when the recipient belonged to another class and when he/she belonged to the same class, demonstrated that when the younger children were afraid of losing their candies, their behavior was in keeping with the norms.

3.2.3. Children's level of satisfaction with their decision

The children were asked how they felt about their decisions of whether and how much to share in the second experiment. Their answers were coded using a five point (from −2 to 2) satisfaction scale, as in the previous study[10]. An ANOVA of level of satisfaction by age group and recipient class showed no significant results.

In order to examine the relationship between the number of candies given and the satisfaction children derived from their sharing decision in the different age groups, a regression analysis was conducted on the children's reports of their level of satisfaction. The predictors were the number of candies given, grade and the interaction between these two variables. Results revealed a significant main effect for grade ($B = −1.09$, $\beta = −1.21$, $t = −3.15$, $p < .01$). Most importantly, the interaction between age group and the number of candies given was also significant ($B = .21$, $\beta = 1.25$, $t = 2.73$, $p < .01$). A separate regression analysis on level of satisfaction by the number of candies given for each of the three age groups separately revealed a significant result for the fourth graders ($B = .36$, $\beta = .35$, $t = 2.58$, $p < .05$), and for the second graders ($B = .28$, $\beta = .34$, $t = 2.62$,

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[9] Three kindergarten children who gave 6 candies each were not included in this analysis. Adding these children to the equal splitters reveals similar results.
[10] In this study, one child chose the very sad face (−2), while all the others' levels of satisfaction ranged between 0 and 2.

Table 4
Expressed level of satisfaction from the decision not to give, to give less than half, or to give half of the candies, by age group (the ultimatum game – study 2; N = 164).

		Kindergarten N = 62	Second grade N = 53	Fourth grade N = 49
Sharers of less than half	Very sad	1		
	Indifferent	2	4	3
	Happy	4	11	11
	Very happy	29	7	5
Equal-splitters (excluding 3 kindergarten children who gave 6 candies)	Indifferent	3	3	3
	Happy	6	5	9
	Very happy	14	23	18
Significance		Chi-square = 4.17, NS	Chi-square = 9.67, p < .01	Chi-square = 5.35, p = .06
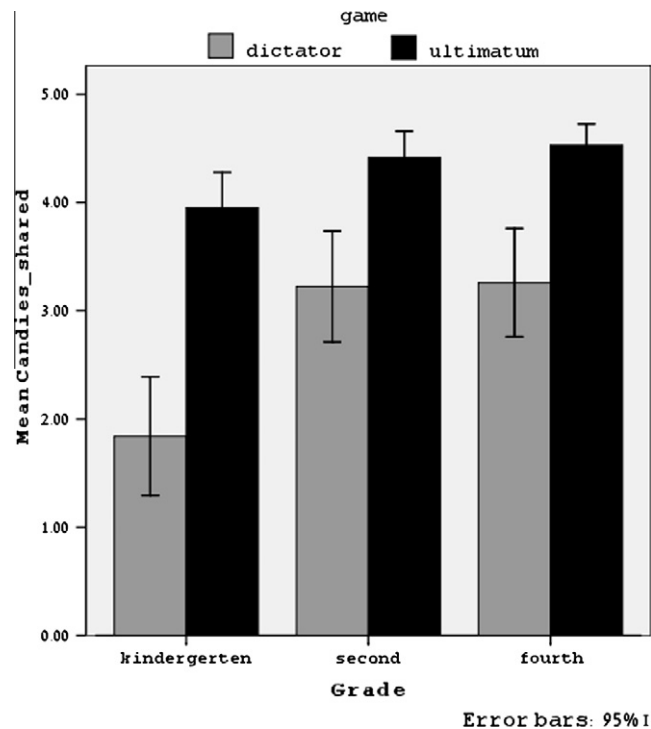
Fig. 3. Mean number of candies shared with the "other child" as a function of age group and game (dictator vs. ultimatum), Interstudy comparison.

$p < .05$), indicating that the more one shared, the greater his/her level of satisfaction. However, the number of candies shared did not significantly predict the kindergarten children's levels of satisfaction.

To examine at which age equal splits produce grater satisfaction, and given that all children gave at least one of their candies, I divided participants into two types of sharing patterns[11]: children who chose an equal split and those that gave less than half of their endowment. Results of an ANOVA on level of satisfaction with grade and sharing pattern as the independent factors show a significant main effect for sharing pattern F(1155) = 4.18, $p < .05$; such that overall, equal splitters expressed greater satisfaction from their decision ($M = 1.54$) than those who gave less than half of their endowment ($M = 1.30$). The interaction between age group and the sharing pattern was also significant F(1, 155) = 3.62, $p < .05$, suggesting that the difference in level of satisfaction between the two sharing patterns is significant for both fourth graders ($t(49) = 2.00$, $p = .05$) and second graders ($t(51) = 2.68$, $p < .05$), but not for the kindergarten children ($t(57) < 1$ NS). As can be seen in Fig. 4, both second and fourth graders expressed greater satisfaction with an equal split than from sharing less than half of their endowment, while the opposite pattern occurs for the kindergarten children[12].

While fourth graders expressed greater satisfaction from an equal split in both games, second graders levels of satisfaction was independent of their sharing pattern in the dictator game; yet, when engaged in the ultimatum game, the children were happier when they gave half of their candies than when they gave less than half. This difference suggests that second

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[11] The three children who gave 6 candies were not included in this analysis.
[12] Results of a non-parametric test reveal similar results: the difference in the level of satisfaction was significant for second graders (Chi-square = 9.67, $p < .01$), approached significance for fourth graders (Chi-square = 5.35, $P = 06$) and was not significant for the kindergarten children (Chi-square = 4.17, NS) (see Table 4).
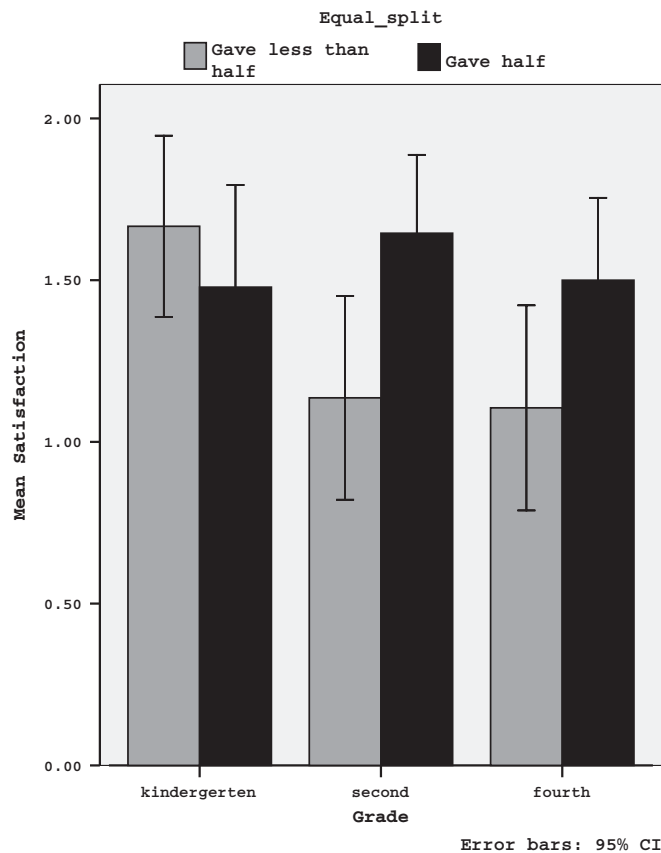
Fig. 4. Mean value on the satisfaction scale from the decision to give less than half or to give half of the candies, by age group (the ultimatum game – study 2).

graders were happier performing equal splits in the ultimatum game, possibly due to efforts to increase the probability of their offers being accepted rather than satisfaction from being fair or from giving more *per se*.

As in the previous study, I examine whether the children who participated later behaved any different from those who participated at the beginning of the experiment. Two analyses were conducted: one on the number of candies shared, and one on levels of satisfaction, each with grade and the time of participation (first half of the experiment vs. second half) as the independent variables. No significant time effect or interactions were found.

4. General discussion

The results of the two studies suggest new insights into how children's sharing behavior develops. Like previous research that examined children's sharing behavior (e.g., Blake & Rand, 2009; Fehr et al., 2008), I found that compared with their older peers, the younger children (5–6 years old) tended to act selfishly and kept their endowments for themselves in the dictator game. Moreover, I showed that at this age group, children's satisfaction from their decision was not dependent on their sharing behavior. Older children (ages 7–8) gave significantly more of their endowments to others, yet their satisfaction was independent of giving. Specifically, among the 7–8 year old givers, equally dividing their endowments did not lead to greater satisfaction relative to children their age who shared less than half of their endowments. It seems, therefore, that for this age group, some of the children gave because they felt obliged to do so not because they really wanted to give. The older (ages 9–10) children's sharing behavior was not significantly different from that of the middle age group (7–8); however, the older children were significantly happier when sharing and especially when sharing half of their endowments in comparison to others their age who did not share at all, or shared less than half of their endowment. It seems that in this case, the children gave because they wanted to, and therefore, they felt better about it.

These findings are in line with behavioral and socialization theories emphasizing the role of society in shaping individual behavior. According to such theories, society's values are transmitted through the internalization of norms (Grusec & Kuczynski, 1997; Parsons, 1967) that children gradually adopt as defining appropriate behavior. The internalization process begins with compliance, which is characterized by conformity to the social norms that is prompted by the desire to acquire rewards or avoid punishment. As children grow, these behaviors become parts of their identities and inherent beliefs. Real

internalization of a norm is achieved through complete acceptance of the beliefs, values, and attitudes that underlie the norm (Gralinski & Kopp, 1993; Kochanska, 1991; Kopp, 1982).

The different stages of the internalization process were evident in this research in the children's behavior and in their subsequent levels of satisfaction in terms of their allocation decisions. Although the younger children (aged 5–6) were aware of the norms (as demonstrated by their behavior in the ultimatum game and by their reactions to recipients from a different class), they did not feel obliged to engage in socially acceptable behavior when playing the dictator game. One possible explanation for this outcome is because the game was anonymous and no reward or punishment was expected, regardless of whether participants observed behavioral norms. Thus, the children did not feel bad when they kept their endowments for themselves and decided not to share at all. In contrast, during the ultimatum game, in which ignoring behavioral norms was potentially costly, they tended to abide by the norms. For the 5–6 year-old age group, following the norms seemed to be dependent on external factors.

Although second graders (7–8) felt obliged to behave according to the norms, they did not fully internalize them. They seemed to be torn between what they wanted to do (keep all the candies for themselves like the younger children) and what they thought they should do (share some or even half of their endowments). Because they shared mostly out of feelings of duty, they did not feel happier when they shared than when they did not share. However, in the ultimatum game, in which sharing is also strategic, giving, and specifically sharing half of their endowment, increased levels of satisfaction. Finally, the oldest children (9–10) in the study were one step ahead of the others in terms of their socialization. Not only did they internalize the norms, they also believed that sharing represented appropriate behavior. Their decisions to share seemed driven by inherent beliefs rather than as a result of external social sanctions. The 9–10 year olds were therefore happier when sharing and especially comfortable dividing their endowments equally in both games.

In summary, although the younger children (5–6) were aware of the fairness norms and children aged 7–8 adopted them in their actual behavior, real inequity aversion appeared only around the age of 9–10: the oldest children who participated in the study not only shared greater numbers of candies with the others, they also felt better, i.e., their levels of satisfaction were higher when they shared than when they did not share. Indeed, only within this age group did the children who shared half of their candies feel happier than those who shared less than half even when no strategic considerations played a role in the decision.

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