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Brief article

Anti-equality: Social comparison in young children

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ABSTRACT

Young children dislike getting less than others, which might suggest a general preference for equal outcomes. However, young children are typically not averse to others receiving less than themselves. These results are consistent with two alternatives: young children might not have any preferences about others receiving less than themselves, or they might have preferences *for* others receiving less than themselves. We test these alternatives with 5- to 10-year-old children. We replicate previous findings that children will take a cost to avoid being at a relative disadvantage, but also find that 5- and 6-year-olds will spitefully take a cost to ensure that another's welfare falls below their own. This result suggests that the development of fairness includes overcoming an initial social comparison preference for others to get less relative to oneself.

1. Introduction

Fairness is a central concern in human moral cognition (Haidt & Joseph, 2004). This has motivated a variety of research into its origins, including comparative research to determine its potential presence in other species (e.g., Bräuer, Call, & Tomasello, 2009; Brosnan & de Waal, 2003; Range, Horn, Viranyi, & Huber, 2009), cross-cultural research to determine the extent to which fairness concerns are cross-culturally consistent or variable (e.g., Henrich et al., 2010), and developmental research to determine its emergence and development throughout childhood.

When evaluating the distribution of resources to third-parties, an appreciation of fairness appears to emerge early in development. Recent studies suggest that infants expect equal distributions of resources (Schmidt & Sommerville, 2011; Sloane, Baillargeon, & Premack, 2012), and prefer characters who enact equal distributions (Geraci & Surian, 2011). Furthermore, children as young as 3 years old show a strong tendency to enact equal divisions between others (Olson & Spelke, 2008; Shaw & Olson, 2012).

First-party cases in which a child is at a disadvantage—"disadvantageous inequality aversion" (Fehr & Schmidt, 1999)—also evoke responses that are consistent with fairness concerns. In particular, children show strong dislike of divisions in which they themselves get less. For example, LoBue, Nishida, Chiong, DeLoache, and Haidt (2009) found that preschoolers become visibly upset if given fewer stickers than another child. Blake and McAuliffe (2011) found that children as young as 4-years-old will reject a distribution of "1 candy for you and 4 candies for another child", choosing for both children to receive nothing rather than being at a relative disadvantage.

Older children also appear to be averse to *advantageous* inequality, in which they receive more than another child (Fehr & Schmidt, 1999). Shaw and Olson (2012) found that children as young as 6 years old will tell an experimenter to discard a resource rather than allocating it to the child and disrupting a pre-existing fair distribution (of two resources each), at least if the experimenter *knows* there is a pre-existing fair distribution (Shaw et al., in press). Blake and McAuliffe (2011) found that 8-year-olds will reject advantageous distributions, as in "4 candies for you and 1 candy for another child". Fehr, Bernhard, and Rockenbach (2008) found that 7- to 8-year-olds receiving one candy preferred another child to receive one rather

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than no candy, at least if the other child was a member of the same school, demonstrating a preference for equality over advantage.

But there is far less evidence that young children are averse to advantageous inequality. When 3- and 5-year-olds from a range of different cultures were given the opportunity to divide resources between themselves and other children, they tended to keep most of the resources for themselves, and were less likely than adults to favor an equal split (Rochat et al., 2009). LoBue et al. (2009) found that 3-year-olds were generally not upset at receiving more stickers than another child. Blake and McAuliffe (2011) found that children under 8 years old tended to accept distributions in which they received more candies than another child.

One possible explanation for this failure to find an aversion to advantageous inequality is that young children are simply unaware that distributions in which they themselves get more are unfair. Smith, Blake, and Harris (2013), however, find that children as young as 3 years old think that they *should* share equally with others, even though they do not. Furthermore, taking an advantage in such situations is not a failure of willpower, in which children plan to share equally but then cannot stop themselves from taking a selfish advantage, because children *predict* that they will take an advantage.

These findings suggest an alternative: although children *know* it would be better to divide resources equally, they are not sufficiently motivated so that they will take a cost to do so. Even when their own payoffs are held constant (e.g., Fehr et al., 2008), they might not feel the normative force of fairness. Even more cynically, it might be that, although children might feel some motivation towards others receiving as much as themselves, they have a contrary motivation to *reduce* others' welfare as much as possible relative to their own. That is, they have a social comparison concern to maximize their own welfare relative to others. Certainly adults engage in constant comparison of themselves with others (Festinger, 1954; Fiske, 2011), and there is some evidence that adults show a preference for relative advantage (Cox, 2013; Dohmen, Falk, Fliessbach, Sunde, & Weber, 2011).

Likewise, there is some evidence that older children engage in social comparison and that this can influence their fairness behavior. In a recent study by Steinbeis and Singer (2013), 7- to 13-year-olds received information about their own performance and another child's performance on a speeded reaction time task. Children liked doing well and disliked doing poorly, and these reactions were exacerbated when told the other child did differently: victory was sweeter when the other child failed rather than succeeded (schadenfreude), and failure was more bitter when the other child succeeded rather than failed (envy). Importantly, however, both of these social comparison effects were weaker for older children. Steinbeis and Singer (2013) also asked children to play the same prosocial, envy, and sharing games from the study by Fehr et al. (2008). They found that decreases in social comparison partially mediated the relationship between age and decisions to minimize the payoff to another child. That is, older children were less likely than younger children to choose for another child to receive the minimum payoff (e.g., choosing "1 for self and 0 for other" rather than "1 each"), but at least part of this developmental difference can be accounted for by the decrease in social comparison emotions seen in the first task.

In the current study, we investigate whether young children prefer others to receive less than themselves. Specifically, we attempt to replicate previous results that young children prefer a fair outcome to a disadvantageous outcome, but we also assess whether they prefer an advantageous outcome to a fair outcome. Furthermore, we investigate whether these preferences are strong enough to overcome a self-interested preference to maximize one's absolute payoff. If so, this would suggest that the developmental origins of fairness include overcoming a strong social comparison preference for others to receive relatively less than oneself.

2. Method

2.1. Participants

We tested twenty-four 5- and 6-year-olds (M_{age} = 72.5 - months, SD = 7.17 months), twenty-four 7- and 8-year-olds (M_{age} = 95.5 months, SD = 6.96), and twenty-four 9- and 10-year-olds (M_{age} = 120.9 months, SD = 5.80). One child in the youngest group and two in the oldest group were excluded from the final analysis due to missing data (from either a camera malfunction or a trial being skipped), leading to a final sample of 69 children. These children were majority female (60%) and majority white (80%).

2.2. Procedure

Each child was tested individually. Across ten trials, children decided between two options for distributing tokens to self and to "another child, who will get here later in the day, after you leave".[1] Children were told the tokens could later be exchanged for prizes in the adjacent room. For each trial, the two options were laid out on a color-coded board. One payoff option was presented on green squares, the other on blue squares. For example, the child in Fig. 1 is choosing the blue option (in which she receives 7 tokens, the other child 0 tokens) over the green (8 tokens each); in the notation used throughout the rest of the paper, this is a choice between a (7,0) and an (8,8) payoff.

2.3. Trials

There were ten trials (see Table 1). Four *Disadvantageous Inequality* (*DI*) trials provided a choice between an equal option and an option in which the subject would receive *less* than the other child. In two of these trials, both options delivered the same payoff to the subject (2,2 vs. 2,3; 8,8 vs. 8,15); in two trials, the equal option (avoiding a disadvantage) entailed a "cost" of 1 token relative to

[1] In some previous studies a receiver was present (e.g., Blake & McAuliffe, 2011), in others the receiver was absent (e.g., Fehr et al., 2008). Given this variability and the goals of this study, we followed the standard used in most adult experimental economics studies: an anonymous situation.

Fig. 1. *Apparatus and procedure*. This 5-year-old is choosing "blue" (seven for self and zero for other, or "7,0"), on her left, over "green" (eight for self and eight for other, or "8,8"), on her right. After each decision, the tokens for the participant are put in the covered box in front of her with her name on it, the tokens for the other girl are put in the unlabeled box, and the tokens from the other half of the board are removed. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

the other choice (1,1 vs. 2,3; 7,7 vs. 8,15). The costly trials address whether children are willing to give up resources to avoid a relative disadvantage.

Four *Advantageous Inequality* (*AI*) trials provided a choice between an equal option and an option in which the subject would receive *more* than the other child. In two trials, both options delivered the same payoff to the subject (2,1 vs. 2,2; 8,1 vs. 8,8); in two trials, the advantageous-inequality option entailed a "cost" of 1 token relative to the equal option (1,0 vs. 2,2; 7,0 vs. 8,8). The costly trials address whether children are willing to give up resources to enact a relative advantage.

Finally, two *control* trials assessed how often children would take a cost of 1 token (perhaps by mistake) when both options provided equal outcomes to both children (1,1 vs. 2,2; 7,7 vs. 8,8).

Each of these five trial types (no-cost DI, costly DI, no-cost AI, costly AI; control) occurred twice, once with low inequality (a difference of 1 between participant's and other's payoffs) and once with high inequality (a difference of 7). The "low" trials were presented as a block and the "high" trials were presented as a block. Within each block, the third (middle) trial was always the control trial, with the other 4 trials fully counterbalanced within block, producing 24 orders per block. "Low" and "high" blocks were randomly paired, producing 24 final trial orders (half of which began with the "low" block).

Table 1
The ten trials presented to each child.

	Low inequality		High inequality	
	No-cost	Costly	No-cost	Costly
DI	2,2 vs. 2,3	1,1 vs. 2,3	8,8 vs. 8,15	7,7 vs. 8,15
AI	2,1 vs. 2,2	1,0 vs. 2,2	8,1 vs. 8,8	7,0 vs. 8,8
Control		1,1 vs. 2,2		7,7 vs. 8,8

3. Results

3.1. Overall age trends

Across the four Disadvantageous Inequity (DI) trials pooled together, 73.9% of the younger, 87.5% of the middle, and 78.4% of the older children chose the fair option over the option that gave the other child more. There was no correlation between age in months and choosing the fair option in DI situations, $p = .271$.

Across the four Advantageous Inequity (AI) trials pooled together, 37% of the younger, 62.5% of the middle, and 71.6% of the older children chose the fair option over the option that gave the other child less. Age in months correlated with choosing the fair option in AI situations, $r = .327$, $p = .006$; that is, older children chose the fair option more often than younger children on AI trials.[2]

3.2. Interaction between age and inequality preferences

We performed a repeated measures ANOVA with Age as the between-subjects factor (age groups: 5–6, 7–8, 9–10) and within-subjects factors of Inequality Magnitude (high, low), Inequality Type (AI, DI), and Cost (no cost, costly). These within-subjects factors specify the 8 non-control trials (see Table 1). In each trial, the choice that reduced the payoff to the other child (i.e., fair rather than DI, or AI rather than fair) was coded as 0, and the other choice was coded as 1.

We found a main effect for Inequality Type ($F(1, 66) = 49.3$, $p < .001$), and an interaction between Inequality Type and Age ($F(2, 66) = 6.1$, $p = .004$). Following up on this interaction, we found that Age is significant for AI ($F(2, 66) = 5.8$, $p = .005$), but not for DI ($F(2, 66) = 1.1$, $p = .329$). Following up on the significant effect for Age for AI trials, we found that, out of a possible score of 4 (answering all 4 AI trials fairly), the youngest age group had a mean score of 1.478 (SD = .297), the middle age group had a mean score of 2.500 (SD = .291), and the oldest age group had a mean score of 2.864 (SD = .304). LSD tests confirmed that the youngest group was different from the middle ($p = .017$) and oldest ($p = .002$), but that the middle and oldest age groups were not different from each other ($p = .391$). The only significant interaction with Inequality Magnitude was with Inequality Type ($p = .008$), specifically that children were less likely to choose a costly option when it was a larger percentage of their payoff.

3.3. Results for costly trials

To analyze the strength of the preferences revealed by the subset of trials involving a cost, we included two

[2] All of our reported analyses are for the entire sample of 69 children. We also ran the analyses with the subset of children who chose the higher payoff in both control trials ($n = 45$), and found substantively identical results.

control trials in the design of the study. Notice, for example, that the only difference between the control trial "1,1 vs. 2,2" and the costly AI trial "1,0 vs. 2,2" is the lesser payoff to the other child when a cost is taken. We can therefore use Fisher's exact tests on each pair to analyze whether children are more likely to pay a cost when it results in a relative decrease in the other's payoff compared to no relative change. Similarly, the costly DI trials assess whether the child is more likely to take a cost when it results in avoiding a relative disadvantage.

Compared to the control trials, children in all three age groups showed a significant willingness to take a cost to avoid a disadvantage in the costly DI situations, Fisher's exact tests, $ps < .05$. On the other hand, only the youngest age group showed significant preferences *against* the fair options in the costly AI situations, compared to the control trials, Fisher's exact tests, $ps < .01$. In contrast, the middle age group did *not* show a significant increase. A Fisher's exact test confirms a significant difference based on age, $p = .03$. Comparing the youngest age group with just the middle age group reveals a trend, Fisher's exact test, $p = .07$; comparing the youngest age group with just the oldest age group reveals a significant difference, Fisher's exact test, $p = .02$.

Fig. 2 shows the preferences in each age group for the costly trials (collapsed across high and low trials). Importantly, the *y*-axis shows choices for the *costly* option, which for DI trials indicates taking a cost to avoid a disadvantage, for AI trials indicates taking a cost to seek out an advantage, and for the control trials indicates taking a cost even though both alternatives provide equal payoffs.

3.4. Summary of results

We found, consistent with previous studies, that children preferred equal distributions over ones that disadvantaged them, and were even willing to take a cost to avoid being at a relative disadvantage. This pattern was equally strong across the entire 5- to 10-year-old age range. Importantly, however, we also found that the 5- and 6-year-olds, but not the older children, preferred advantageous over equal distributions, even at a cost. Specifically, young children choose the spiteful options on both costly advantageous trials, paying to reduce another's welfare below their own ($ps < .01$). The significant correlation between age in months and fairness choices in the AI trials suggests that this tendency decreases from age 5 to age 10.

4. Discussion

Many recent investigations into the origins of fairness have found that young children dislike being at a relative disadvantage (e.g., Blake & McAuliffe, 2011; LoBue et al., 2009). We replicate this result with 5- to 10-year-olds, but also find that children under age 7 prefer an advantageous division over an equal division, and prefer it sufficiently strongly to take a spiteful cost to choose the advantageous division. These results suggests that the development of a preferences for fairness over advantage must overcome an initially contrary preference for advantage over fairness.

A strengthening fairness preference might also be expected to reinforce children's aversion to being at a disadvantage. Indeed, previous studies (e.g., Blake & McAuliffe, 2011), though not our study, have found an increase in aversion to DI with age. We may have not found this effect because even our youngest age group showed strong preferences against disadvantage, perhaps because the maximum cost in our study was one arbitrary currency unit. In parallel with a strengthening fairness preference, a weakening social comparison preference for schadenfreude might reduce children's attraction to being at an advantage, as suggested by Steinbeis and Singer (2013).

In any case, young children show strong preferences for reducing others' payoffs. They will, in fact, take spiteful costs to reduce others' welfare below their own. Indeed, this strong social comparison motivation to maximize relative welfare might *also* partially account for children's aversion to receiving less—an aversion to receiving less

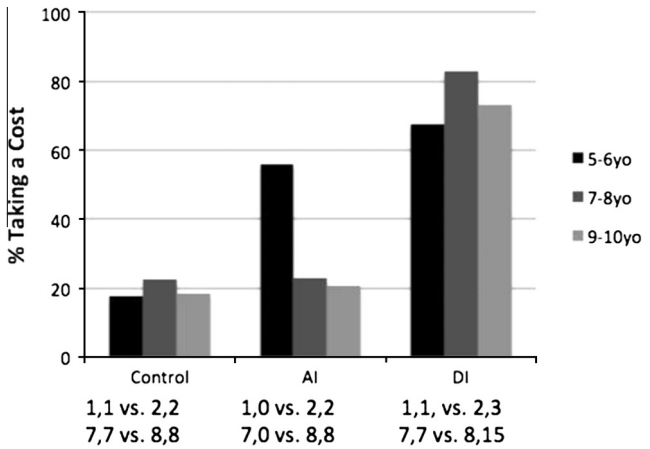

Fig. 2. *Choices for costly trials.* The figure shows the percentage of children choosing to take a cost for the control, costly AI, and costly DI trials. Whereas children of all ages show increased willingness to take a cost to avoid a disadvantage, only the younger children show significantly higher choices of the costly option to seek an advantage.

than another and an attraction for receiving more might work together to motivate reducing others' relatively high payoffs. Future research into the origins of fairness should investigate not only the development of aversion to inequality, but also the attraction to it.

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