

# The Development of Inequity Aversion: Understanding When (and Why) People Give Others the Bigger Piece of the Pie



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## Abstract

Children and adults respond negatively to inequity. Traditional accounts of inequity aversion suggest that as children mature into adults, they become less likely to endorse all forms of inequity. We challenge the idea that children have a unified concern with inequity that simply becomes stronger with age. Instead, we argue that the developmental trajectory of inequity aversion depends on whether the inequity is seen as fair or unfair. In three studies ( $N = 501$ ), 7- to 8-year-olds were more likely than 4- to 6-year-olds to create inequity that disadvantaged themselves—a fair type of inequity. In findings consistent with our theory, 7- to 8-year-olds were not more likely than 4- to 6-year-olds to endorse advantageous inequity (Study 1) or inequity created by third parties (Studies 2 and 3)—unfair types of inequity. We discuss how these results expand on recent accounts of children’s developing concerns with generosity and partiality.

## Keywords

inequity aversion, generosity, partiality, fairness, social cognitive development, open data, open materials

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From distributing toys on the playground to raises in the office, children and adults respond negatively to inequity (Hook & Cook, 1979). According to traditional accounts of inequity aversion, people believe that it is inherently unfair to give unequal rewards for equal effort (Adams, 1965; Fehr & Schmidt, 1999); as children mature into adults, they gradually understand that inequity is unfair and therefore place increasing weight on avoiding it (Fehr, Bernhard, & Rockenbach, 2008). Prior results have been consistent with these accounts: Between the ages of 4 and 8, children increasingly sacrifice resources to avoid inequity (Blake & McAuliffe, 2011; Kogut, 2012; Moore, 2009).

We challenge these accounts by suggesting that reactions to inequity may take different developmental paths depending on the type of inequity and the way it is created. Once children have matured into adults, they do not seem to find inequity to be inherently unfair and instead find some types of inequity unacceptable and other types acceptable. For example, if Mark and Danielle are being given things by someone else, Mark will find it unfair if Danielle receives more than he does.

However, when Mark is the one deciding how to allocate the resources between himself and Danielle (i.e., when Mark is agentic), he will think it is fair to receive less than Danielle (Choshen-Hillel, Shaw, & Caruso, 2015; Choshen-Hillel & Yaniv, 2011, 2012). The different reactions to these two forms of inequity are apparent in an episode of PBS’s *Sesame Street* (Myhrum, 1979) in which Ernie takes a big piece of pie for himself and gives a smaller piece to Bert. Bert responds, “That is not very polite. I mean, if I had two pieces of pie, I’d offer you the big piece and take the small one for myself.” Ernie confusedly replies, “Well . . . you have the small piece, Bert.” Ernie is missing the point; Bert is not upset about the inequity per se but is instead upset about what the inequity entails: unfairness. That is why he would willingly disadvantage himself but is upset when Ernie creates the same inequity.

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We argue that as children mature, they behave less like Ernie and more like Bert; they become more tolerant of self-created disadvantageous inequity but less tolerant of other types of inequity. Although traditional accounts acknowledge that different types of inequity aversion exist and that negative reactions to disadvantageous inequity appear earlier in development than do negative reactions to advantageous inequity (Blake & McAuliffe, 2011; Fehr et al., 2008), they argue that both types of inequity aversion become stronger as children grow older. Contrary to these traditional models, our prediction was that 7- to 8-year-olds (hereafter referred to as older children) will be more likely to create inequity that disadvantages themselves than will 4- to 6-year-olds (hereafter referred to as younger children).

Two key developments that occur between these ages underlie our prediction. First, as children grow older, they desire to be more generous (e.g., Benenson, Pascoe, & Radmore, 2007; Fehr et al., 2008), which may help them override the negative feelings that usually result from being disadvantaged. Self-created disadvantageous inequity is a form of generosity in that it entails incurring a cost to oneself to benefit another. Second, as children grow older, their concerns with inequity become increasingly focused on avoiding being or appearing to be partial (i.e., showing favoritism to one person over another; DeScioli & Kurzban, 2009, 2013; Shaw, 2013; Waytz, Dungan, & Young, 2013). That is, older children respond negatively not to inequity per se but instead to the partiality that inequity often entails, making them increasingly willing to accept inequity when it is not seen as partial (e.g., when it is produced by a random device; Shaw & Olson, 2014). Self-created disadvantageous inequity may be more acceptable to older children because agents who give other people more than they give themselves are, if anything, only being partial against themselves (Choshen-Hillel et al., 2015).

Our studies supported this basic prediction that older children would be more likely than younger children to endorse self-disadvantaging inequity. Note that we predicted and found that children do not become more tolerant of inequity that does not allow them to be generous or impartial, such as self-advantaging inequity (Study 1) or disadvantageous inequity created by other people (Study 2). Finally, we demonstrated that generosity alone is not sufficient to explain self-disadvantaging behavior; even when older children could be generous to someone else, they refused to do so if it meant having to show favoritism to one person over another (Study 3).

## Study 1

In Study 1, we investigated children's reactions to inequity by asking them to allocate a resource to 1 of 2

children (creating inequity) or to throw the resource in the trash (preserving equity). We varied whether the resource could go to the participant or to another child. In general, inequity-aversion models predict that as children grow older, they will become increasingly likely to avoid both self-advantaging and self-disadvantaging inequity (Fehr et al., 2008). For self-advantaging inequity, we made the same prediction as these models because such inequity is nongenerous and is partial. However, contrary to these models, our prediction was that the older children would be more willing than the younger children to create self-disadvantaging inequity because letting others have more than they had is generous and unlikely to be seen as partial.

## Method

**Participants.** We recruited 212 children at a local science museum. There were 132 younger children ( $M = 65.36$  months,  $SD = 9.90$ ; 47% female) and 80 older children ( $M = 96.67$  months,  $SD = 7.27$ ; 54% female). We chose these age groups because previous research has found that concerns with generosity and impartiality increase during this time (Fehr et al., 2008; Shaw & Olson, 2014).

For each study, we obtained the consent of the parent and the assent of the child (in accordance with the institutional review board's protocol). We began data collection at the middle of the academic quarter once each study design was finalized and ready. We collected data every Saturday and Sunday for the remainder of the quarter and attempted to collect as many 4- to 8-year-old participants as possible before stopping at the end of the academic quarter, when the research assistants were no longer available. We did not analyze the data until data collection for each study had concluded.

**Procedure.** Each child sat at a table and was told that we were going to ask some questions that had no right or wrong answers. In all conditions, each child was asked to distribute toy erasers between him- or herself and another child (the paradigm was adapted from Shaw & Olson, 2012). Each child was randomly assigned to either the self-advantaging condition or the self-disadvantaging condition (wording changes for the latter condition are shown in brackets). A research assistant read the following passage to them:

Because you have done such a good job learning at the museum today, we want to give you some erasers as a prize. We want to give some erasers to you and to another little boy named Mark who also did a really good job learning at the museum today.

We have these three erasers to give to you and to Mark. Mark and you each get one eraser. Now we have one left over. What do you want to do with it? Do you want to give it to you so you will have more than Mark or do you want to throw it away [Do you want to give it to Mark so he will have more than you or do you want to throw it away?]

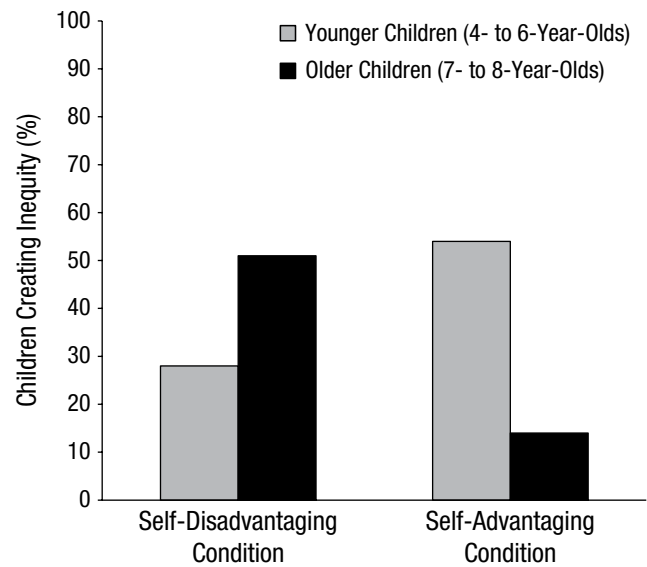
Within each condition, the word order of the last sentence was counterbalanced across participants. Half the participants heard the sentence in the order “give it . . . or throw it away,” and the other half of the participants heard the sentence in the order “throw it away or give it . . . .” For female participants, we gave the other child the name “Mary.”

The erasers were placed onto small boxes (flat squares drawn in with a black marker) labeled with the letters “M” and “Y” (to signify “Mark” and “You”). The toy erasers were colorful and shaped like such objects as ice-cream cones, turtles, and magic wands (such erasers were also used to study resource sharing in Shaw & Olson, 2012, 2014). There was an actual small trash can on the table so that if the child decided to throw the eraser away, it would literally be thrown into the trash.

## Results

We conducted a logistic regression analysis with age group (younger children or older children) and inequity (self-advantaging or self-disadvantaging) as independent variables and choice as a dependent variable. The analysis revealed no significant main effect of age group, Wald  $\chi^2(1, N = 212) = 1.67, p = .20$ , or inequity, Wald  $\chi^2(1, N = 212) = 2.12, p = .15$ . In addition, there was a significant interaction between age group and inequity, Wald  $\chi^2(1, N = 212) = 17.10, p < .001$ . We used planned comparisons (Fisher’s exact test) to examine the children’s responses in the two conditions separately by age. In the self-advantaging condition, the older children were less likely than the younger children to create inequity by giving the additional resource to themselves (older children: 14%, 6 of 43; younger children: 54%, 36 of 67),  $p < .001, \phi = .40$  (see Fig. 1). However, the children responded very differently to disadvantageous inequity. In results consistent with our hypothesis, the older children in the self-disadvantaging condition were more likely than the younger children to create inequity by giving the additional resource to someone else (older children: 51%, 19 of 37; younger children: 28%, 18 of 65),  $p = .02, \phi = .24$ .

To determine whether responses were different from what would be expected if the children were picking at random, we conducted binomial sign tests for all conditions. In the self-advantaging condition, the older



**Fig. 1.** Results from Study 1: percentage of children creating inequity in each condition, presented separately for the younger children and the older children.

children created inequity at below chance levels,  $p < .001$ , whereas the younger children responded at chance levels,  $p = .63$ . In the self-disadvantaging condition, the older children responded at chance levels,  $p = 1$ , whereas the younger children created inequity at below chance levels,  $p < .001$ .

We also conducted Fisher’s exact tests comparing the two age groups’ responses in the two conditions. The older children were less likely to create inequity in the self-advantaging condition than in the self-disadvantaging condition,  $p < .001, \phi = .40$ . That is, the older children were more willing to create a distribution in which they received less than others than one in which they received more than others. We observed the opposite pattern among the younger children: They were less likely to create inequity in the self-disadvantaging condition than in the self-advantaging condition,  $p = .003, \phi = .26$ . That is, the younger children were more willing to create a distribution in which they received more than others than one in which they received less than others.

In a follow-up experiment, we found a very similar pattern of results when the children were given all three options (give to self, give to other, or throw away); the younger children gave the resource to themselves, and the older children split between giving it to the other person and throwing it away (see Study S1 in the Supplemental Material available online). This finding is important because it suggests that self-disadvantaging behavior is evident even when the child has the opportunity to be selfish (when they could take the resource for themselves).

## Discussion

We found that the older children were less likely to create advantageous inequity than the younger children, which is in line with the predictions of inequity-aversion accounts (Fehr et al., 2008). However, contrary to these accounts, and as we predicted, the older children were more willing than the younger children to create inequity that disadvantaged themselves.

## Study 2

In Study 1, we demonstrated that the older children were more likely to create disadvantageous inequity than the younger children. We suggested that this difference was driven by increases in the desire to be generous and the tolerance of impartial inequity. If our suggestion is correct, then these mechanisms should cause the older children to endorse disadvantageous inequity only when this inequity is self-created. If someone else creates this inequity, children should not feel generous (because they lack agency in the decision process; Aknin, Hamlin, & Dunn, 2012) and should view the decision as an example of being partial (because the distributor would be favoring the other recipient over him- or herself). Hence, we predicted that the older children would be more tolerant only of disadvantageous inequity that they created and not of disadvantageous inequity that someone else created.

## Method

**Participants.** We recruited 191 children at a local science museum. There were 115 younger children ( $M = 63.92$  months,  $SD = 9.92$ ; 49% female) and 76 older children ( $M = 95.03$  months,  $SD = 6.99$ ; 61% female).

**Procedure.** As in Study 1, the children were told that they and another child would be receiving a total of three toy erasers in exchange for answering questions. The children were then randomly assigned to the disadvantaged-by-self condition or the disadvantaged-by-other condition.

The children in the disadvantaged-by-self condition were read the following instructions: "Mark and you each get one eraser. Now we have one left over. You can either give it to Mark or you can throw it away." The research assistant then put up a binder so that the trash can and the other child's envelope were occluded behind the binder. The children were then asked, "Do you want to give it to Mark so he'll have more than you or do you want to throw it away?" (This condition was very similar to the self-disadvantaging condition in Study 1 except for the use of the binder.)

The children in the disadvantaged-by-other condition were read similar instructions but were clearly informed

that someone else (i.e., the experimenter) was deciding who got the extra eraser, thus minimizing the child's sense of agency in this decision: "Mark and you each get one eraser. Now we have one left over. I can either give it to Mark or throw it away." The research assistant then put up a binder so that the trash can and the other child's envelope were occluded behind the binder. Then the research assistant said, "I decided what to do" and showed the children the eraser above the binder. The research assistant then lowered his or her hand behind the binder, hiding the eraser, and then brought the empty hand above the binder. He or she then said, "OK. I made my decision and it can't be changed. Would you be happier if I gave it to Mark so he'll have more than you or if I threw it away?"

As in Study 1, in both conditions, half of the participants heard the sentence in the order "give it to Mark [you] or throw it away," and the other half of the participants heard the sentence in the order "throw it away or give it to Mark [you]." For female participants we used the name "Mary."

## Results

We conducted a logistic regression analysis with age group (younger children or older children) and agent (disadvantaged by self or disadvantaged by other) as independent variables and choice as a dependent variable. The regression revealed no significant main effect of age group, Wald  $\chi^2(1, N = 191) = 1.34, p = .25$ , but there was a significant main effect of agent, Wald  $\chi^2(1, N = 191) = 8.18, p = .004$ , whereby participants were more likely to create disadvantageous inequity in the disadvantaged-by-self condition than in the disadvantaged-by-other condition. In addition, the interaction between agent and age group was marginally significant, Wald  $\chi^2(1, N = 191) = 3.03, p = .08$ . We used planned comparisons (Fisher's exact test) to compare the two age groups' responses in the two conditions. In the disadvantaged-by-self condition, we found that the older children were more likely than the younger children to create disadvantageous inequity by giving out the additional resource (older children: 58%, 22 of 38; younger children: 35%, 21 of 60),  $p = .04, \phi = .22$ . These findings are consistent with our hypothesis and replicate the results of Study 1: When asked to decide how to distribute resources, the older children were more likely than the younger children to give an additional resource to someone else (instead of wasting it). Note that in the disadvantaged-by-other condition, the two age groups showed no significant difference in the tendency to favor disadvantageous inequity (younger children: 27%, 15 of 55; older children: 24%, 9 of 38),  $p = .81, \phi = .04$ . The older children were just as likely as the younger children to avoid

inequity when the disadvantageous allocation was created by someone other than themselves (see Fig. 2), which is in line with our hypothesis.

To determine whether responses were different from what would be expected by chance, we conducted binomial sign tests on all conditions. In the disadvantaged-by-self condition, the older children favored disadvantageous inequity at chance levels,  $p = .42$ , whereas the younger children responded at below chance levels,  $p = .03$ . In the disadvantaged-by-other condition, the older children favored disadvantageous inequity at below chance levels,  $p = .002$ , as did the younger children,  $p = .001$ .

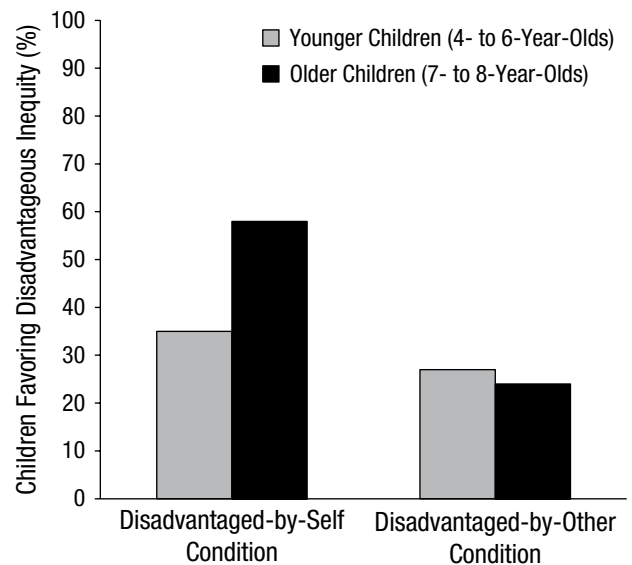
We also conducted Fisher's exact tests comparing the children's responses in the two conditions in each age group. The older children were more likely to create disadvantageous inequity in the disadvantaged-by-self condition than in the disadvantaged-by-other condition,  $p = .005$ ,  $\phi = .35$ , whereas the younger children did not favor inequity at different rates in the two conditions,  $p = .42$ ,  $\phi = .08$ .

## Discussion

In Study 2, we demonstrated that the older children's increased acceptance of self-created disadvantageous inequity was not explained by their increased tolerance of all disadvantageous inequity: The older children disliked disadvantageous inequity created by a third party as much as the younger children did. In a follow-up experiment, we found that the older children and younger children were similarly likely to avoid creating partial inequity that disadvantages third parties (see Study S2 in the Supplemental Material). Thus, we found that the older children were more accepting of disadvantageous inequity than the younger children, but only when the disadvantageous inequity was self-created.

## Study 3

We have demonstrated that the older children were more likely than the younger children to create self-disadvantageous inequity, and we have suggested two developmental mechanisms: the older children experienced (a) increased desire to be generous and (b) increased concern with being or appearing to be partial. To understand whether concerns with partiality (and not just a desire to be generous) influenced the children's reactions to inequity differently as they got older, we ran a new condition that directly tested whether the older children and the younger children disadvantaged themselves when doing so was generous yet partial. This condition was similar to the self-disadvantaging condition from Study 1, but we added a second recipient and had participants decide



**Fig. 2.** Results from Study 2: percentage of children favoring disadvantageous inequity in each condition, presented separately for the younger children and the older children.

whether they wanted to give the resource to the first child, the second child, or throw it away. If generosity is the sole cause of self-disadvantaging behavior, then the older children should be more likely than the younger children to give the eraser to 1 of the other 2 children because this is a generous behavior. However, if concerns with being or appearing to be partial contribute to children's endorsement of self-disadvantaging behavior, then the older children should tend more than the younger children to throw the eraser away because giving it would force them to show favoritism to one equally deserving recipient over another.

## Method

**Participants.** We recruited 98 children at a local science museum. There were 59 younger children ( $M = 65.55$  months,  $SD = 9.42$ ; 58% female) and 39 older children ( $M = 94.73$  months,  $SD = 7.55$ ; 46% female).

**Procedure.** All participants from both age groups were assigned to the other-disadvantaging condition. This condition was similar to the self-disadvantaging condition from Study 1, in which the participant and another child received one toy eraser and the participant had to decide whether they wanted to give an extra eraser to the other child (putting themselves at a relative disadvantage) or to throw the eraser in the trash. The main difference in this new condition is that the participant and 2 other children received one toy eraser each, and if the participant

wanted to give out the extra eraser, he or she would have to choose between the other 2 children. The participants were read the following passage:

Because you've done such a good job learning at the museum today we want to give you some erasers as a prize. We want to give some erasers to you and to two other little boys named Mark and Dan who also did a really good job learning at the museum today. We have these four erasers to give to you, Dan, and Mark. We have one for you . . .

At this point, the research assistant placed an eraser on a piece of paper in front of the participant and then continued: ". . . one for Dan, and one for Mark." The research assistant then placed an eraser on a piece of paper labeled with the letters "D" and "M," and then he or she said:

You, Dan, and Mark each got one eraser. Now we have one left over. What do you want to do with the last eraser? You can either throw it away or you can give it to one of the two boys. You can give it to Mark so that he will have more than Dan. Or you can give it to Dan so that he'll have more than Mark. So you have three options: You can throw the eraser away, you can give the eraser to Mark, or you can give the eraser to Dan. What do you want to do: Throw the eraser away, give it to Mark, or give it to Dan?

As in the previous studies, the order of the options was counterbalanced: Half of the participants heard the sentence in the order "You can either throw it away or you can give it to one of the two boys"; the other half of the participants heard the sentence in the order "you can either give it to one of the two boys or you can throw it away." For female participants, we used the names "Mary" and "Danielle." We predicted that the older children would be reluctant to share in this context because they would not want to be or appear to be partial.

## Results

The children's responses were categorized as either endorsing inequity (i.e., choice to give the extra eraser to 1 of the other children) or not (i.e., choice to throw it away). We then conducted Fisher's exact tests to compare the two age groups' responses. Our results were consistent with our hypothesis: The older children in the other-disadvantaging condition were less likely than the younger children to create inequity by giving out an additional resource (older children: 21%, 8 of 39; younger

children: 54%, 32 of 59),  $p = .001$ ,  $\phi = .34$ . Thus, when the children were forced to choose between two other participants, the older children were less likely than the younger children to create inequity, even though the choice in question would have been generous (i.e., it would have disadvantaged themselves and given a benefit to another).

To determine whether responses were different from what might be expected by chance, we conducted a binomial sign test. The older children created inequity at below chance levels,  $p < .001$ , whereas the younger children responded at chance levels,  $p = .60$ .

We further wanted to compare responses in each age group of the other-disadvantaging condition with responses in the self-disadvantaging conditions from our previous studies (i.e., the self-disadvantaging condition from Study 1, the disadvantaged-by-self condition from Study 2, and the disadvantageous condition from Study S2 in the Supplemental Material). We found that the older children were more likely to create inequity in the self-disadvantaging conditions (54%, 56 of 103) than in the other-disadvantaging condition (21%, 8 of 39),  $p < .001$ ,  $\phi = .30$ . Conversely, we found that the younger children were less likely to create inequity in the self-disadvantaging conditions (28%, 46 of 162) than in the other-disadvantaging condition (54%, 32 of 59),  $p < .001$ ,  $\phi = .24$ .

## Discussion

The results of Study 3 suggest that children do not choose to create inequity that is generous (i.e., that disadvantages themselves by giving to another) when it entails being partial (i.e., favoring one child over another). Although this result reveals that generosity is not sufficient to explain the self-disadvantaging behavior that we have documented in the current studies, we believe that generosity is a critical component in explaining children's increasing self-disadvantaging behavior in our previous studies. Simply reducing partiality would not cause children to create inequity here unless children had some desire to be generous to other people in the first place.

## General Discussion

Our studies provide evidence challenging the idea that inequity concerns are part of a single aversion to inequity that simply becomes stronger as children grow older (e.g., Blake & McAuliffe, 2011; Fehr et al., 2008). Instead, we found that 7- to 8-year-olds were more likely than 4- to 6-year-olds to create self-disadvantageous inequity. This pattern was markedly different from the developmental trajectory for other forms of inequity aversion that were not generous and that were partial.

This developmental pattern is not the result of the older children's greater likelihood of endorsing disadvantageous inequity more broadly; rather, it is specific to self-created disadvantageous inequity that is both generous and impartial. Indeed, when the children were being disadvantaged by someone else, older and younger children rejected inequity at similarly high rates (Study 2). This finding is important methodologically because it may help to reconcile why paradigms in which children are asked to react to distributions set up by an experimenter (e.g., Blake & McAuliffe, 2011; Blake et al., 2015) often find high levels of disadvantageous inequity aversion, whereas paradigms in which children are given a sense of agency (e.g., Chernyak & Kushnir, 2013) often demonstrate that children are happy to allow another person to have more than they have. Seemingly inconsistent findings on adults' social preferences also have been attributed to changes in agency (Choshen-Hillel & Yaniv, 2011, 2012).

Our experiments provide converging evidence for an emerging *partiality aversion* in which children become more tolerant of impartial inequity, shifting from a focus on inequity to a focus on the partiality that inequity entails (Shaw, 2013, in press; Shaw & Knobe, 2013; Tyler, 2000). Previous research has found that children endorse inequity by using impartial procedures by age 7 (Shaw & Olson, 2014), and the current findings suggest a similar developmental emergence of self-disadvantaging behavior.

We note that our experiments do not speak to the question of whether the older children's willingness to create disadvantageous inequity is connected to their emerging self-presentational concerns—that is, whether they want to be generous and impartial or want merely to appear so. Specifically, between the ages of 7 and 8, children become more generous (Fehr et al., 2008) and respond more negatively to partiality (Mills & Grant, 2009; Shaw & Olson, 2014), but also increasingly care about how they appear to other people (Aloise-Young, 1993; Heyman, Barner, Heumann, & Schenck, 2014; Shaw, Li, & Olson, 2013). We think that self-disadvantaging behavior is likely to stem from a combination of these motives (for an extended discussion, see Shaw et al., 2013; Shaw et al., 2014). If children's behavior goes beyond mere self-presentational concerns, then children should actually be more satisfied with disadvantageous inequity that they create as opposed to inequity that other people create, which could be a useful strategy for reducing dissatisfaction with unfairness.

## Conclusion

Children develop an increasingly complex understanding of fairness as they mature. In their early development, children are like Ernie—they dislike any form of inequity and may discard resources rather than let others have

more than they do. As they grow older, children become more like Bert—although they are not always happy when others get more, they would much rather give the bigger piece of pie to others than waste it, as long as the decision about who gets the smaller piece of pie comes from them rather than someone else.

## Action Editor

Ralph Adolphs served as action editor for this article.

## Author Contributions

All of the authors developed the study concept and contributed to the study design and data analysis. Testing and data collection were performed by A. Shaw. All of the authors interpreted the data and drafted the manuscript. All of the authors approved the final version of the manuscript for submission.

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## Supplemental Material

Additional supporting information can be found at <http://pss.sagepub.com/content/by/supplemental-data>

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