



Children Develop a Veil of Fairness

Citation

Shaw, A., N. Montinari, M. Piovesan, K.R. Olson, F. Gino, and M.I. Norton. "Children Develop a Veil of Fairness." *Journal of Experimental Psychology: General* (forthcoming).

Permanent link

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Children develop a veil of fairness

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Word Count: 9,429

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Acknowledgements: This research was supported by a grant from the University of Chicago's ARETE Initiative/A New Science of Virtue Program. The authors would like to thank Alia Martin, Felix Warneken, Matthias Sutter, Peter Blake, and members of our lab groups for their comments on a previous draft. We would also like to thank Anna Merrill, Alex Chituc, Kelly Reina, and Suzanne Horwitz for running many of the participants in these studies. This material is based upon work supported by the National Science Foundation under Grant No. 1004797.

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Abstract

Previous research suggests that children develop an increasing concern with fairness over the course of development. Research with adults suggests that the concern with fairness has at least two distinct components: a desire to be fair, and a desire to signal to others that they are fair. We explore whether children's developing concern with behaving fairly towards others may in part reflect a developing concern with *appearing* fair to others. In Experiments 1-2, most 6- to 8-year-old children behaved fairly towards others when an experimenter was aware of their choices; fewer children opted to behave fairly, however, when they could be unfair to others yet appear fair to the experimenter. In Experiment 3, we explored the development of this concern with appearing fair by using a wider age range (6- to 11-year-olds) and a different method. In this experiment, children chose how to assign a good or bad prize to themselves and another participant by either unilaterally deciding who would get each prize or by using a fair procedure – flipping a coin in private. Older children were much more likely to flip the coin than younger children, yet were just as likely as younger children to assign themselves the good prize by reporting winning the coin flip more than chance would dictate. Overall, the results of these experiments suggest that as children grow older they become increasingly concerned with appearing fair to others, which may explain some of their increased tendency to behave fairly.

Keywords: fairness, inequity aversion, reputation, social signaling, social cognitive development

Children develop a veil of fairness

Fairness is an important feature of human resource sharing that promotes unselfish behavior in a wide range of contexts (Blau, 1964; Fehr & Schmidt, 1999; Organ, 1988). Concerns with fairness appear in nearly every culture in the world, even in small hunter-gatherer societies (Boehm, 2008; Gurven, 2004; Henrich, 2004). As a result, scholars across disciplines, from economics to neuroscience to psychology, have long been interested in the study of fairness, with a large body of research suggesting that humans respond negatively to violations of fairness and are even willing to assume personal costs to avoid unfairness (Adams, 1965; Dawes, Fowler, Johnson, McElreath, & Smirnov, 2007; Fehr, Goette & Zehnder, 2009; Kahneman, Knetsch, & Thaler, 1986). This willingness to incur costs to avoid unfairness appears to develop over the course of childhood, with three-year-olds being very unwilling to incur costs in order to be fair and eight-year-olds more willing to do so (for review, see Hook & Cook, 1979). Fehr, Bernhard, and Rockenbach (2008) have argued that this developmental shift indicates that humans develop a preference for fairness over the course of childhood.

At the same time, however, other research has shown that people often act to create an appearance of fairness without actually bearing the costs of being fair (Andreoni & Bernheim, 2009; Batson, Kobryniewicz, Dinnerstein, Kampf, & Wilson, 1997). Certainly, adults often assume costs to themselves to choose equal outcomes over unequal ones (Fehr & Schmidt, 1999), and when equal outcomes are impossible they often opt into using fair (impartial) procedures to decide how to assign a desirable resource (Batson et al., 1997; Kimbrough, Sheremeta, & Shields, 2012). However, adults are considerably less willing to pay costs to achieve equal outcomes when they can be unfair without appearing unfair (Andreoni & Bernheim, 2009; Dana, Weber, & Kuang, 2007; Levitt & List, 2007; Reis & Gruzen, 1976);

though they opt into fair procedures in public settings, they often only honor the outcome of fair procedures if it favors them (Batson et al., 1997). Taken together, these streams of research highlight an important distinction between *being* fair and *appearing* fair to others. Of course, children are also concerned with how they appear to others, and children's tendency to engage in self-presentation increases as they approach eight to ten years of age (Aloise-Young, 1993; Apfelbaum, Pauker, Ambady, Sommers, & Norton, 2008; Banerjee, 2002; Piaget, 1932; Selman, 1980; Turiel, 2006). Interestingly, children become increasingly concerned with how they appear to others around the same ages at which previous research suggests they are becoming more concerned with being fair.

In this paper, we explore whether previous research documenting the childhood development of a desire to *be* fair may be partly assessing the development of a desire to *appear* fair. Here we define fairness in terms of impartiality (Shaw & Olson, 2012; Tyler, 2000), that is, avoiding showing favoritism toward oneself or toward another individual. Being impartial often means pursuing equal outcomes, but when equal outcomes are impossible impartiality can be achieved by using impartial procedures (Kimbrough et al., 2012; Thibaut & Walker, 1975). Across three experiments which investigate preferences for both fair outcomes and fair procedures, we investigate whether children, like adults, attempt to appear fair without being fair in some contexts – showing an appreciation of the benefits afforded by cloaking unfair decisions under a veil of fairness.

Being Fair versus Appearing Fair

Two broad classes of models have been proposed to explain why adults act fairly: social preference models and social signaling models. Social preference models propose that people like, or have a preference for, fairness. Similar to other preferences, say for caviar or fancy wine,

people are willing to pay costs to satisfy this preference (Adams, 1965; Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999). Social preference models suggest that when people generously share or fairly split their resources with others they are demonstrating their preference for fairness over selfish alternatives. In contrast, social signaling models propose that the motivation underlying fair behavior is a desire to demonstrate to others that one is fair, rather than a desire to actually be fair. People frequently engage in behaviors that allow them to appear nice, altruistic, and fair to others (Barclay & Willer, 2007; De Cremer & Sedikides, 2008; Kahn & Young, 1973; Latane, 1970; Milinski, Semmann, & Krambeck, 2002; Reis & Gruen, 1976); this self-presentation or impression management is a ubiquitous aspect of social interaction (Baumeister, 1982; Leary, Allen, & Terry, 2011; Leary & Kowalski, 1990). Social signaling models therefore predict that individuals should be less willing to pay costs to be fair if their unfair behavior is unlikely to be discovered by others (Andreoni & Bernheim, 2009; Dana et al., 2007). These models contend that individuals do not prefer fairness per se, but merely that others think that they are fair. Obviously people could, in theory, have both a social preference for fairness and a desire to appear fair to others.

However, these two models differ in the extent to which transparency—or the degree to which others are aware of one's fair and unfair behavior (Dana et al., 2007)—should influence one's behavior. Social preference models predict that transparency should have no effect on fair behavior; if fairness is a stable social preference, it should hold regardless of whether one's decisions are observed by others (Fehr & Schmidt, 1999). In contrast, social signaling models predict that transparency will exert an impact on behavior precisely because other people's knowledge is *driving* people's fair behavior; insofar as others believe that an individual is being fair, actually behaving fairly is irrelevant (Andreoni & Bernheim, 2009). Consistent with the

prediction of social signaling models, adults often behave less fairly if they can be unfair without looking unfair to others (Dana et al., 2007; Kagel, Kim, & Moser, 1996, Larson & Capra, 2009; Levitt & List, 2007; Reis & Gruzen, 1976). Appearing fair without actually being fair can also be achieved by obscuring the fact that one decided to be unfair, or by leading others to believe that a fair procedure was used to determine how resources are allocated even if a fair procedure was not actually used (Batson, Thompson, & Chen, 2002; Dana et al., 2007; Dana, Cain, & Dawes, 2006; DeScioli, Christner, & Kurzban, 2011).

In one elegant paradigm, Batson and colleagues (2002) demonstrated that, in a setting in which equality in outcomes cannot be achieved, individuals use seemingly impartial procedures to appear fair to others while being unfair. Participants had to assign a desirable task and an undesirable task to themselves and another participant, and could either simply choose the task they wanted for themselves or use a fair procedure (flipping a coin) to assign the tasks. If participants chose the fair procedure, they flipped the coin in private and then reported the task assignment to the experimenter. Half of the participants were unfair by selfishly choosing the better option for themselves, whereas the other half flipped the coin. However, of those who opted to flip the coin, the majority still assigned themselves to the good task and the other participant to the bad task, suggesting that they ignored the result of the coin flip. Flipping the coin and then being unfair by lying about the outcome of the coin flip is a result consistent with social signaling models: individuals who flip the coin appear fair to the experimenter (achieving social signaling) while fulfilling their selfish desire to be assigned to the good task. This behavior is not consistent with social preference models, which would predict that people who have social preferences for fairness would flip the coin and abide by the outcome. In sum, research on adults suggests that people are motivated by social signaling and sometimes use strategies to avoid

being fair if they can still appear fair.

A developing motivation to appear fair?

If fairness is partly rooted in a human desire to present oneself in a favorable light, then we might be able to find evidence for social signaling even in young children's early decisions to be fair. However, the bulk of research on fairness in children has not focused on documenting children's desire to appear fair, but instead focuses on investigating the development of their actual taste for fairness. Considerable research has suggested that children are concerned with fairness. For example, 16- to 19-month-old infants gaze longer when resources are distributed unequally rather than equally between two recipients, and prefer fair over an unfair distributors, with fairness here defined as distributing resources equally to those who have done equal work (Geraci & Surian, 2011; Schmidt & Sommerville, 2011; Sloane, Baillargeon, & Premack, 2012). In the preschool years, children allocate resources equally between recipients when possible (Damon, 1977; Hook & Cook, 1979; Olson & Spelke, 2008; Sigelman & Waitzman, 1991). Between the ages of 6 and 8, children will sacrifice their own resources in order to be fair (Blake & McAuliffe, 2011; Shaw & Olson, 2012). While these studies have demonstrated that children behave fairly, they have left unanswered a critical question: whether children's fair behavior is partly motivated by a desire to appear fair to observers as a form of self-presentation. In most of these experiments, an experimenter had full knowledge of children's decisions –making it difficult to know the true nature of children's fairness decisions.

Importantly, research does suggest that by around age 8 children understand and care about self-presentation. Between the ages of 9 and 11, children employ self-promotional strategies to influence the impressions they make on those around them (Aloise-Young, 1993) and are aware that others engage in self-presentation as well (Bennett & Yeeles, 1990). They

further appreciate that certain traits are more desirable than others depending on the audience; for instance they recognize that they should behave differently to impress their peers than to impress an adult (Banerjee, 2002). Around the same age, children understand that not only one's actions, but also what others say about one's actions, can influence how one is seen by a peer group (Hill & Pillow, 2006; Houser, Montinari, & Piovesan, 2012). Additionally, children in Western society recognize that expressing negative racial attitudes or even acknowledging racial differences can reflect poorly on them and so they learn to inhibit their judgments based on race between the ages of 8 and 10 years old (Apfelbaum et al., 2008; Rutland, Cameron, Milne, & McGeorge, 2005). Taken together, these studies suggest that, around age 8 or 9, children have an understanding of the factors that go into impression formation, modify their own behaviors, and know that others should modify their behaviors in service of appearing favorably to others.

In sum, children's concern with being fair follows a developmental time course parallel to the development of concerns with self-presentation, with both concerns strongly present by age 8 years old. We explore whether previous research with children documenting the development of concerns about *being* fair may be at least in part assessing the development of concerns about *appearing* fair. Indeed, some initial evidence is consistent with this claim. Children aged 6 to 14 are more generous when a recipient (a classmate) can view their decision (Buhrmester, Goldfarb, & Cantrell, 1992); however, this increased generosity may be due merely to the desire to avoid negative emotional reactions from that specific recipient – say, tears and anger. In our experiments, we ensure that recipients are not present and a third party observer is, allowing us to specifically investigate children's motivation to appear fair to third parties rather than merely to avoid negative reactions from recipients.

Overview of the present research

Across three experiments, we examine whether children's fair behavior is motivated by a preference for fairness – defined both in terms of fair outcomes (Experiments 1 and 2) and fair procedures (Experiment 3) – or a desire to demonstrate their fairness to others. We first investigate whether children are influenced by transparency, and then examine whether or not children develop a tendency to cloak their unfair decisions under a veil of fairness – becoming more likely with age to choose procedures that allow them to be unfair without appearing unfair to others. In Experiments 1 and 2 we investigate whether children are willing to choose unfair *outcomes* for others, when they believe an experimenter will not know they are being unfair and when they can gain resources for themselves by being unfair. We predict that, as in previous research, children will be fair when their allocation decisions will be transparent to others. However, consistent with social signaling models, we predict that children will be systematically less fair when transparency is decreased.

In Experiment 3, we investigate children's tendency to use seemingly fair *procedures* to be unfair without appearing unfair, by running a conceptual replication of Batson et al. (2002) with children; most importantly, we investigate whether the tendency to cloak decisions under a veil of fairness increases over the course of childhood, from age 6 to age 11. Our goal was to investigate whether, in a situation where fairness in outcomes cannot be achieved, children would choose a fair procedure (flipping a coin) to appear fair but then lie about the outcome so that they could receive the more attractive option. Based on research showing that children are concerned with fairness in this age range and research demonstrating that self-presentational concerns increase as children grow older, we predicted that the likelihood of choosing to flip a coin would increase with age – reflecting children's increased desire to *appear* fair. In contrast, we predicted no differences across ages in children's tendency to give themselves a more

attractive outcome regardless of the outcome of the coin flip – their desire to actually *be* fair.

Experiment 1

To investigate whether children's behavior is motivated partly by a desire to appear fair, we varied what children thought an experimenter knew in three conditions (for similar manipulations of others' knowledge in adults, see Dana et al., 2007; Guth, Huck, & Ockenfels, 1996). In the first condition, children were presented with a choice of allocating a resource in a way that was fair or unfair, in an environment in which the experimenter had full knowledge of the resulting (in)equality. In the other two conditions, the experimenter had mistaken information about the number of resources that either the participant or another recipient had. Participants had a chance to decide whether to allocate a resource in a fair way or in an unfair way. The unfair option either benefitted the participant or another recipient.

We investigated 6- to 8-year-old children because previous research has suggested that children in this age group demonstrate fair behavior (Hook & Cook, 1979). Though younger children can recognize and correct unfair outcomes (Geraci & Surian, 2011; LoBue, Nishida, Chiong, DeLoache, & Haidt, 2011) they do not show a robust willingness to incur costs to avoid unfairness until between the ages of 6 and 8 years old (Blake & McAuliffe, 2011; Hook & Cook, 1979; Shaw & Olson, 2012).

In order to investigate if children were specifically concerned with appearing fair we used a recent measure of fairness developed by Shaw and Olson (2012), a measure that does not conflate fairness with generosity (Charness & Rabin, 2002). In typical tasks used to measure fairness, an individual is given some resources and asked whether she wants to selfishly keep more for herself or share them with another person (Fehr & Schmidt, 1999; Sigelman & Waitzman, 1991). A willingness to share resources with others in this situation is thought to

evidence a concern with fairness, but it could be motivated by concerns with being generous, something we know children also care about (Brownell, Svetlova, & Nichols, 2009; Eisenberg & Fabes, 1998; Svetlova, Brownell, & Nichols, 2010). In order to measure fairness specifically, Shaw and Olson (2012) presented children with a situation in which fairness concerns and generosity concerns would result in different behaviors. Specifically, resources were distributed equally and participants were asked if they wanted to give an additional resource to themselves or throw the resource in the trash (or in another condition if they wanted to give an additional resource to one of two third-party recipients or throw the resource in the trash). In this task, taking more for oneself (or giving out an additional resource to one of the recipients) did not involve imposing costs on others since the resource would be thrown in the trash if it was not given out. Despite creating a low-cost opportunity to take more for oneself, Shaw and Olson (2012) found that children opted for fairness and most often threw a resource in the trash in order to avoid inequality (for a similar measure of fairness in adults, see Shaw & Knobe, in press). Here, we investigate whether this sense of fairness, separate from generosity, is partly motivated by self-presentational concerns—would children be less likely to discard a resource in the name of fairness if an experimenter would not know they were being unfair?

Method

Participants. Participants included sixty 6- to 8-year old children: 20 in the Transparent Self Condition ($M = 7$ years, 3 months; $SD = 7.5$ months; 11 females), 20 in the Opaque Self Condition ($M = 7$ years, 3 months; $SD = 10$ months; 15 females), 20 in the Opaque Envy Condition ($M = 7$ years, 2.5 months; $SD = 10.5$ months; 11 females), and 20 in the Opaque Other Condition ($M = 7$ years, 3 months; $SD = 13$ months; 11 females). Children were recruited through a database of families who had agreed to participate in developmental research and

participated in these tasks in our developmental laboratory.¹

Procedure. Children were first asked some unrelated questions so that they could be rewarded with erasers and were then assigned to one of three conditions. In the Transparent Self Condition, a conceptual replication of Study 4 in Shaw and Olson (2012), the participant was told that she and another non-present, gender-matched recipient (who in all conditions was identified only by a written name on his/her envelope) would each be given some erasers as a prize for answering the initial questions and that these erasers would be placed on top of envelopes with the recipients' name on each envelope. The participant and the non-present recipient were then each given two erasers on top of their envelopes. The experimenter said that she forgot an eraser in the other room and then went to get the eraser. When the experimenter returned with the additional eraser (within a minute of leaving the room), the experimenter asked the participant if she should give the eraser to the participant or throw it away.

In the Opaque Self Condition, children were provided with the opportunity to be unfair without appearing unfair to the experimenter. In this case, the participant was given one eraser and the other non-present recipient was given two erasers; the erasers were placed inside the envelopes. The experimenter then said she forgot an eraser in the other room and went to get it. When the experimenter was gone a confederate entered the room and gave the child an additional eraser. The confederate then said: "Shh, don't tell (experimenter's name)" and left the room. The purpose of having the confederate say this was to reduce the likelihood that children would spontaneously mention to the experimenter that they had been given an extra eraser before they were given the option to take an eraser or throw it away. The experimenter returned and asked the participant if the experimenter should give the extra eraser to the participant or throw the eraser away. As in the Transparent Self Condition, at the time the choices were presented to

the participant, both the participant and the non-present recipient had two erasers (but in the Opaque Self Condition the erasers were inside envelopes).

In the Opaque Envy Condition the non-present recipient was the one to receive only one eraser in their envelope while the child participant received two. Again, the experimenter left the room and the confederate came in, this time placing an extra eraser in the non-present recipient's envelope and saying "Shh, don't tell (experimenter's name)". When the experimenter returned, she asked the child if she should give the eraser to the non-present recipient or throw it away. We assume that in such a case children should be more inclined to be fair since they have nothing to gain. Thus, this condition served as a control for the possibility that children might take the additional resource for themselves in the Opaque Self Condition not because they were taking advantage of the experimenter's ignorance but because of a motivation to comply with the confederate's request to be sneaky and not let the experimenter know each recipient now had two resources (which might be seen as "tattling"). If children are motivated to avoid tattling on the confederate, they should behave similarly in the Opaque Self and Opaque Envy Conditions. If they are motivated to appear fair but be unfair when it is in their advantage to do so, they should discard the additional resource more often in the Opaque Envy Condition.

The Opaque Other Condition was similar to the Opaque Envy Condition, but here both potential recipients were gender-matched non-present children (Mark/Mary and Dan/Danielle). The erasers were placed inside the envelopes, with Mark/Mary getting 1 and Dan/Danielle receiving 2. The experimenter then left to get an additional eraser. A confederate then entered the room and gave the non-present child who had fewer erasers an additional eraser, saying to the participant, "Shh, don't tell (experimenter's name)," then left. The experimenter returned and asked if she should give the eraser to Mark/Mary or throw it away. We included this condition to

reduce social comparison, which might be one motivation for children to throw the eraser away: children may choose to discard the eraser in the Opaque Envy Condition not because of a concern with fairness but simply because they do not want the other person to get more than them based on social comparison. The Opaque Other Condition decreases social comparison concerns since social comparison is much less likely in third party distribution tasks where individuals have no endowment with which to compare their rewards to others (Chang, Winecoff, & Platt, 2011; Shaw & Olson, 2012). Figure 1 provides a schematic of all conditions in the experiment.

We chose to have the experimenter be the potential audience for children's fair behavior since the experimenter is often the only person present in many experiments on fairness in children (Fehr et al., 2008; Hook & Cook, 1979; Shaw & Olson, 2012; Sigelman & Waitzman, 1991). We wanted to investigate whether a desire to appear fair to an experimenter partly motivates children's fair behavior in these contexts. We chose this option rather than having the recipient be the audience because in cases where the recipient is present (Blake & McAullife, 2011; Buhrmester et al., 1992; Leimgruber, Shaw, Santos, & Olson, in press), it is possible that children will be fair in order to avoid negative reactions from a potential recipient rather than to appear fair.

Results

A 4x2 Yates-corrected chi-squared test on the Transparent Self, Opaque Self, and Opaque Other Conditions revealed an effect of condition, $\chi^2(3, N = 80) = 10.41, p = .015$. A binomial test on the Transparent Self Condition revealed that children opted to be fair by throwing the eraser in the trash (80%, 16 out of 20) rather than taking it for themselves, $p = .012^2$. In contrast, a binomial test on the Opaque Self Condition revealed that children opted to be fair by throwing

the eraser in the trash (25%, 5 out of 20) at *below* chance levels, $p = .041$. That is, when children no longer risked appearing unfair and could gain from being unfair, they were substantially less fair. Indeed, a Yates-corrected chi-squared test revealed that children behaved significantly differently in these two conditions, $\chi^2(2, N=40) = 10.03, p = .002$. A binomial test on the Opaque Envy and Opaque Other Conditions revealed that children showed no preference for being fair (60% in both conditions, 12 out of 20, threw the eraser away) over being unfair and giving the eraser to the other recipient, both $ps = .503$. A Yates-corrected chi-squared test revealed that children were (marginally) more likely to be unfair in the Opaque Self Condition than in the Opaque Envy Condition, $\chi^2(1, N=40) = 3.68, p = .055$, or the Opaque Other Condition, $\chi^2(1, N=40) = 3.68, p = .055$. Since we obtained the same result in both of these conditions we include only the Opaque Other Condition on the graph for simplicity (see Figure 2). This result suggests that children did not act unfairly in the Opaque Self Condition simply to avoid tattling on the confederate, since the action of the confederate was held constant across these conditions. Furthermore, a Yates-corrected chi-squared test on the Opaque Envy and Opaque Other Condition revealed that these two conditions did not differ, $\chi^2(1, N=40) = 0, p = 1$.

Discussion

These results indicate that children's fair behavior is partly driven by wanting to appear fair to an experimenter since children were less fair when they could be unfair without the experimenter knowing. When everything was out in the open, children sacrificed a resource in order to uphold fairness. However, when children could appear fair, but actually be unfair in a way that favored them, children chose this option, something they did not do when someone else stood to gain from the unfairness.

One concern about our method is that the confederate's use of the word "shh" and request

not to tell the experimenter what happened in the Opaque Conditions may have incentivized children to be unfair, not because they wanted to be unfair but because they were afraid of tattling on the confederate. Although this explanation could account for the overall lower rates of fair behavior in the Opaque conditions, it cannot explain why children were less fair in the Opaque Self Condition than the Opaque Other or Opaque Envy Condition since the worry about informing on the confederate was present in all conditions. The only difference between these conditions was whether the unfairness benefited the child or not. When they could benefit from the unfairness, children were more unfair than they were when someone else could benefit from the unfairness. Importantly, most children were only willing to unfairly take more for themselves when they would not risk appearing unfair to the experimenter. Therefore, even though we did not ask children why they were fair, we can infer that our manipulation was what caused the different behavior in these two conditions.

The difference between conditions could be explained in at least two ways. One explanation is that children sometimes inhibit their desire to unfairly take more resources for themselves when others will know they have been unfair and that by changing what the experimenter knew, we allowed children to be unfair. A second explanation is that children were primed to be sneaky or underhanded by being exposed to a confederate who said “Shh”, leading children to be more unfair than they normally would be. If one adds an assumption that priming sneakiness is more likely to cause a child to be unfair in ways the benefit herself, this could potentially explain our results. If the second explanation is correct, then removing the factors that primed sneakiness should cause children to be fair once again. In Experiment 2 we manipulate transparency without using a confederate and eliminating the use of the word “Shh” and request not to tell the experimenter; this should remove any concerns with priming sneakiness in

children. If children are still less fair when transparency is obscured in Experiment 2 without priming sneakiness, we will have evidence that it is transparency that changes children's behavior.

Experiment 2

In Experiment 2 we investigated whether children's concerns with fairness are influenced by an even more subtle manipulation of transparency: providing an opportunity for plausible deniability by introducing ambiguity about how many erasers the recipients had. In the two new critical conditions, we varied whether the participant herself or a non-present recipient would potentially benefit from the plausible deniability. Importantly, this manipulation of transparency did not include a confederate, the word "Shh", or a request to conceal information from the experimenter, potential concerns from Experiment 1.

Method

Participants. Participants included sixty 6- to 8-year old children: 20 in the Transparent Self Condition ($M = 7$ years, 2 months; $SD = 11$ months; 11 females), 20 in the Plausible Deniability Self Condition ($M = 7$ years, 4.5 months; $SD = 11$ months; 10 females), and 20 in the Plausible Deniability Other Condition ($M = 7$ years, 3 months; $SD = 12$ months; 10 females).

Procedure. Children completed an unrelated task so that they could be rewarded with erasers. In the Transparent Self Condition, an exact replication of the Transparent Self Condition from Experiment 1, the participant and another non-present, gender-matched recipient each received some erasers on top of their envelopes (two erasers each). As in Experiment 1, the experimenter left the room and returned, and the participant then had to decide whether to keep an additional eraser for herself or throw it away. The erasers were on top of the envelopes (in plain sight) throughout the experiment.

The procedure for the Plausible Deniability Self condition was the same as in the Transparent Self Condition except that the erasers were placed inside the envelopes. Putting the erasers inside the envelopes could create plausible deniability in two ways. First, children could have felt licensed to be unfair because they thought the experimenter forgot how many erasers they had. Second, if the experimenter did notice that they had been unfair, children could claim that they had forgotten how many erasers they had. Therefore, by placing the erasers inside the envelopes we allowed children the possibility of being unfair (giving an additional eraser to themselves and creating inequality) without necessarily appearing unfair. Of course, children could *actually* forget how many erasers were in their envelope. To be certain this was not the case, a third group of children was assigned to the Plausible Deniability Other Condition, which was the same as the Plausible Deniability Self Condition except that both recipients were now non-present children (Mark/Mary and Dan/Danielle, gender-matched to the participant) who were being rewarded for doing a good job answering questions. Thus, when the experimenter returned she asked if she should give the eraser to Mark/Mary or if she should throw it away. See Figure 3 for a schematic of these conditions. If children in the Plausible Deniability Self Condition forgot how many erasers were inside the envelopes, then they should also forget in this case because the erasers were again inside the envelopes. However, we predicted that children would not forget how many erasers were in the envelopes and would be more likely to be fair and throw the additional eraser away in the Plausible Deniability Other condition than in the Plausible Deniability Self condition.

Results

A 3x2 Yates-corrected chi-squared test on the Transparent Self, Plausible Deniability Self, and Plausible Deniability Other conditions revealed a significant effect of condition, $\chi^2(2,$

$N = 60$) = 6.85, $p = .033$. A binomial test on the Transparent Self Condition revealed that children opted to do what was fair by throwing the eraser in the trash (85%, 17 out of 20) rather than taking it for themselves, $p = .003$. A binomial test on the Plausible Deniability Self Condition revealed that children showed no preference for doing what was fair (45%, 9 out of 20, threw the eraser away), $p = .82$. A Yates-corrected chi-squared test revealed that children were significantly less likely to do what was fair (i.e., they were more likely to take the eraser for themselves) in the Plausible Deniability Self Condition as compared to the Transparent Self Condition $\chi^2(1, N=40) = 5.39, p = .020$. A binomial test on the Plausible Deniability Other Condition revealed that children were more likely to be fair (80%, 16 out of 20) by throwing the eraser in the trash rather than giving it to the non-present recipient, $p = .012$. A Yates-corrected chi-squared test revealed that children were more likely to do what was fair in the Plausible Deniability Other Condition than they had been in the Plausible Deniability Self Condition $\chi^2(1, N=40) = 3.84, p = .05$.

Discussion

As in Experiment 1, children opted to be fair rather than unfair when all resources were out in the open; however, when resources were hidden, creating some plausible deniability, children unfairly accepted an extra resource for themselves more often than when things were transparent. This result suggests that part of the reason children are fair when everyone has full knowledge is to avoid appearing unfair, since children were substantially less fair when there was some doubt about whether or not the experimenter would know the child had been unfair.

Our results cannot be explained by children's inability to track how many erasers were in the envelopes when the resources were hidden. The only difference between the Plausible Deniability Self Condition and the Plausible Deniability Other Condition was whether the

additional eraser could be given to the participant herself or to someone else. Yet, in the Plausible Deniability Other Condition children were able to keep track of how many erasers were in each of the envelopes, and chose the fair option of throwing the extra eraser away. Since children could keep track of how many erasers were in each envelope in this third party condition, we can presume that they could do this equally well in the case where they were one of the recipients. This suggests that children were not confused in the Plausible Deniability Self condition, and instead took advantage of the plausible deniability to take more for themselves. This result, coupled with the fact that children gave substantially less in the Plausible Deniability Self condition compared to the Transparent Self Condition, suggests that children will take more for themselves by being unfair if they have plausible deniability.

Importantly, these results suggest that children are influenced by transparency even in the absence of behaviors that prime sneakiness. In the Plausible Deniability Conditions of Experiment 2 there was no confederate, no one said “Shh,” and asked the child to conceal information from the experimenter, and the experimenter did not even make note of that fact that the erasers were inside envelopes. Yet children still modified their behavior based on the lack of transparency. This result allays the concern from Experiment 1 that children were only being unfair because they were primed to be sneaky. The results of Experiment 2 instead favor the interpretation we propose: that children are less fair in when transparency is reduced because they can be unfair and take more for themselves without appearing unfair to others.

Taken together, Experiments 1 and 2 provide evidence that children are motivated to appear fair using the paradigm from Shaw and Olson (2012). We next investigate whether children are also motivated to appear fair and unselfish to others in another task that has been used with adults and that focused on fairness in procedures rather than in outcomes. In

Experiment 3, we conducted a conceptual replication of Batson and colleagues' (1997) research on adults' willingness to be unfair while still appearing fair to others.

Experiment 3

In Experiment 3 we examined whether children are concerned with appearing fair to others using a different procedure and also examined whether children's willingness to use procedures that obfuscate their unfairness from others – the veil of fairness – increased with age. Here, children could assign themselves a good prize or a bad prize. They were given the option of simply choosing which prize they wanted or flipping a coin behind a curtain and then telling the experimenter whether they had won the good prize or the bad prize. Given the nature of the paradigm, it was not possible to achieve a fair split of final outcomes; as a result, in this study children could be fair by selecting and using an impartial procedure to allocate resources. For this reason, children who are concerned with being (or appearing) fair should opt for the fair procedure (flipping a coin) rather than being partial and taking the better prize for themselves, and further, should use the actual flip of the coin to guide their decisions. However, we predicted that some children, like adults (Batson et al., 1997), would choose a seemingly fair procedure (flipping a coin) to appear fair but then lie about the outcome, if the desired outcome was not achieved, so that they could receive the more attractive option without appearing unfair to others. Compared to Experiments 1 and 2, where fairness was defined in terms of equality of outcomes, Experiment 3 focused on of procedures in a situation where fairness of outcomes could not be achieved.

We predicted that the likelihood of choosing the seemingly fair procedure (coin flipping) would increase with age – reflecting children's increased awareness that they could use this procedure to *appear* fair without having to pay the cost of *being* fair (i.e., possibly allocating a

bad prize to themselves). However, based on our previous experiments, we predicted that even the 6- to 8-year-old children would be just as likely to lie and give themselves the better option when they did opt to flip the coin—when they could be unfair without appearing unfair.

Method

Participants. Participants included 566³ 6- to 11-year-old children ($M = 8$ years, 9 months; $SD = 1$ year and 4 months; 279 females). The children were from 41 classrooms across ten schools in the district of Treviso, in Italy.

Procedure. Each child was asked to assign a prize to themselves and a prize to another person: a *good prize* (a colored highlighter pencil, labeled “Prize A”) or a *bad prize* (a normal pencil, labeled “Prize B”). Children were presented with two options regarding the procedure to use for the prize assignment: taking the prize that they liked better immediately, or flipping a coin in private to decide who would receive the better prize. Since children of this age have been shown to behave in accordance with much more complex probability calculations of expected value (Schlottmann, 2001), we were confident that children understood the manner in which coin flips can be used to determine outcomes. Further, children commonly use coin flips or other randomization procedures (e.g., rock, paper, scissors) in their daily lives and research has shown that children as young as age 5 understand that events determined by random chance are not predictable (Kuzmak & Gelman, 1986). Each child chose between the two options in front of the experimenter, but the option they chose was not revealed to any other child in the classroom. Children who chose to flip the coin were asked to flip the coin only once behind a screen, in a place both visually and acoustically isolated that assured their privacy, and then fill out a sheet to indicate the outcome. After flipping the coin and indicating the outcome, children returned both the coin and the report sheet to the experimenter. The outcome of the flip was both self-reported

and in private to give children the opportunity to report that they won the *good prize* even if they lost the coin flip.

Results

Across our analyses, we use age as our main independent variable. We divided children into two groups of three-year increments: we included the 6- to 8-year-old age group (N=287) we had tested in our previous experiments and an older 9- to 11-year-old age group (N=399).

We first had to determine if children really did prefer the *good prize*, so we examined what children chose when they opted not to flip the coin. A binomial sign test on those children who immediately chose a prize rather than flipping the coin, revealed that children were more likely to choose the good prize (89.5%, 272 out of 304) than the bad one, $p < .001$. This was true for both 6- to 8-year-olds (89.5%, 136 out of 152), $p < .001$ and 9- to 11-year-olds (89.5%, 136 out of 152), $p < .001$. Importantly, these results did not differ across age groups (χ^2 test, $p = 1.000$). Thus both age groups were equally likely to desire the good prize more than the bad prize – and thus children who did opt to flip the coin would be motivated to misreport the results of the fair coin flip to obtain the good prize.

We then examined whether age predicted the likelihood of choosing the fair procedure – flipping a coin – to determine the assignment of the two prizes. A Logit regression revealed that children's age predicted the choice to flip ($B=.66$, $SE=.22$); as age increased, the percentage of children choosing to flip the coin increased significantly, from 36.9% (89 out of 241) for 6- to 8-year-olds to 53.2% (173 out of 325) for 9- to 11-year-olds (see Figure 4), Mann-Whitney test, $p < .001$. But does this preference reflect a real concern with being fair, or just a concern with appearing fair as we predicted?

We now turn to analyses of what the children reported after they flipped the coin. Would older children – who previous research suggests have developed a concern for fairness – be more likely to resist this urge to unfairly take the better prize for themselves and fairly report the outcome of the coin flip? Among children who chose to flip the coin, 62.2% (163 out of 262) reported winning the good prize, a percentage significantly greater than 50% ($p < 0.001$), the percentage of good prizes that a fair coin would have caused them to actually win. Interestingly, and in line with our hypotheses, this result did not differ across age groups ($\chi^2=0.136$ $p = 0.712$). Children in both age groups were likely to report winning at levels above what one would expect by chance, 60.7% (54 out of 89) for the 6- to 8-year-old age group; 63.0% (109 out of 173) for the 9- to 11-year-old age group, (all $ps < 0.003$; see Figure 4).

Discussion

Taken together, our studies provide converging evidence using 2 different paradigms that children's fair behavior is at least partly motivated by a desire to appear fair to others. Many children chose to flip a coin rather than selfishly taking the better reward for themselves, but of those who chose the fair option some ignored the outcome of the coin and allocated the better reward to themselves. We further found that children's willingness to use this seemingly fair coin flip increased with age. That is, all children were equally likely to be unfair once they decided to use the seemingly fair procedure, but older children may have felt a greater pressure to use the coin flip because they were more concerned with appearing unfair to the experimenter if they did not use the coin flip.

Alternatively, children may have initially decided to flip the coin and planned to be fair, but changed their mind after they were given time to think about their decision. If this alternative explanation were correct, then we should expect the same pattern of results if the child is first left

alone and then later is given the choice to flip the coin in front of the experimenter. This does not appear likely, but we cannot rule out this explanation based on the data from Experiment 3.

However, an explanation based on children changing their minds cannot account for the results from Experiments 1 and 2 because children were given the same time to think in all conditions and still opted to be unfair when transparency was obscured. Therefore, we favor the interpretation that offers the most parsimonious account for the three studies we described—that children are more unfair when they can be unfair without appearing unfair.

Comparing the findings in Experiment 3 with the ones in Experiments 1 and 2, children appeared to be less concerned with appearing fair in Experiment 3 since a smaller percentage of participants chose the fair option overall when making their decision in front of an experimenter. There are a number of possible reasons for the differences in behavior across these different tasks. First, it is possible that having an exactly equal outcome as a possibility in Experiments 1 and 2 highlighted the expectation of fairness from the experimenter and thus increased fair behavior. In contrast, fairness was not specifically highlighted in Experiment 3. Second, appearing fair in Experiments 1 and 2 may have been less costly to children since they had already received two attractive resources before having to decide whether to make a fair choice, whereas in Experiment 3 being fair could have meant that the participant received only a boring pencil. That is, there may have been a higher personal cost in Experiment 3 compared to Experiments 1 and 2. Obviously children will be less willing to pay costs to appear fair as the costs of fairness increase. In support of this suggestion, Blake and Rand (2010) demonstrated that children are more likely to be fair when the costs of giving are lower. It is worth noting that the difference between tasks observed here is consistent with adult work in which 70 percent of participants are fair in a non-anonymous dictator game (e.g. Andreoni & Bernheim, 2009;

Bohnet & Frey, 1999), whereas only 50 percent of adults chose to flip a coin rather than selfishly assigning themselves a better prize (Batson et al., 1997); these results parallel the results of Experiments 1-2 and Experiment 3 respectively.

Indeed, because of inconsistencies between tasks in baseline tendencies toward fairness and cooperation, some have suggested that it is more important to examine how manipulations within tasks influence behavior rather than focusing on baseline differences in fair behavior between tasks (Kümmerli, Burton-Chellew, Ross-Gillespie, & West, 2010). Determining what factors prompt one to value fairness, or the appearance of fairness, in some contexts is an important question for future research, but not one that our experiments were designed to answer. Taken together, our studies do suggest that across tasks with different baselines of fairness, children are fairer when their actions are transparent than when they are not.

General Discussion

These experiments illustrate that children engage in fair behavior not only because of concerns with actually being fair, but also in order to appear fair to others. As a result, social preference models of fairness which argue that people have a taste for fair outcomes may not provide a complete picture of children's allocation behavior. Instead, children's behavior seems to be rooted partly in a motivation to present themselves favorably to others, consistent with social signaling models (Andreoni & Bernheim, 2009). Children were more willing to assume a cost to be fair when the experimenter would know the child was being unfair than when the experimenter might not know (Experiments 1 and 2). We also found that children as young as age 6 will sometimes use an ostensibly fair procedure (i.e., flipping a coin to distribute a good vs. bad reward to themselves and a peer) in an unfair way (i.e., misreporting the result of the coin flip) in order to receive a better outcome for themselves without looking unfair. Most

importantly, children were more likely to opt into this “fair” procedure as they got older (Experiment 3). Together, these results suggest that children’s fair behavior throughout middle childhood is at least partly motivated by wanting to appear fair to others. As children get older, perhaps one skill they develop is becoming savvier at determining additional strategies for achieving this goal. These results suggest that children are concerned about fairness, but will sometimes be unfair if it means they can get more for themselves – provided they can avoid the appearance of unfairness.

Our results offer support for our contention that children’s behavior is driven at least in part by the desire to appear fair – but what are children trying to signal to third parties when they attempt to appear fair? Interestingly, children did not signal a preference for socially desirable outcomes: being fair in Experiments 1-2 required throwing resources in the trash which resulted in allocating fewer resources overall, suggesting that children were not merely trying to signal their generosity to the experimenter. One possibility is that appearing concerned with fairness allows people to signal to others that they are impartial (Shaw, DeScioli, & Olson, in press). While alliances and friendships are clearly important – people favor their allies and will take their side in potential conflicts with others (DeScioli & Kurzban, 2009b) – people also highly value impartiality and seek out impartial individuals (e.g., civil judges) to adjudicate conflicts (Tyler, 1994; Tyler & Lind, 1992). Indeed, valuing impartiality appears to be particularly unique to human beings and is somewhat mysterious (DeScioli & Kurzban, 2009a, in press). People may be more willing to create inequality and take more for themselves if the inequality is created in ways that do not imply preferential treatment or partiality (such as the outcome being determined by random chance or by the amount of work done). Importantly for this account, children and adults should especially be concerned about whether the procedure *appears*

impartial to others. We found some support for this notion in Experiment 3, where children used a procedure that appeared impartial to others in order to assign themselves to the outcome they wanted – and did so increasingly with age. Moreover, in support of this prediction, children demonstrate a willingness to pay costs in order to uphold fairness at about the same time developmentally (by about age 6) that children understand that one’s alliances and partiality can bias decision-making (Mills & Grant, 2009; Mills & Keil, 2008).

Although our results reveal that children are motivated to appear fair, they also demonstrate that some children were fair even when transparency was obscured—they still chose to throw away resources that could go to themselves (Experiments 1 and 2) and honestly reported the outcome of the coin flip (Experiment 3). One possible explanation for this behavior in the current experiments is that these children may have suspected that experimenters were somehow monitoring their decisions. Indeed, it may be difficult to realistically convince participants that they are not being watched inside a laboratory even if double blind procedures are used (Franzen & Pointner, 2012). Another explanation for children’s continued fair behavior is that children in our experiments actually possess a sense of fairness that would persist even when they were convinced that no one would observe their decision (Fehr & Schmidt, 1999). People may have a genuine sense of fairness that still influences their behavior even when no one is watching, possibly because having a sense of fairness makes one more likely to avoid negative reactions from others. Sometimes the best way to convince others that one is fair is to actually have a sense of fairness (Frank, 1988). That is, people’s social preferences for fairness at the proximate level may ultimately be rooted in social signaling; precisely because humans likely did not evolve to consider *any* interactions truly anonymous, it would have made sense to always be at least a little fair (Hagen & Hammerstein, 2006; Shaw & Santos, 2012). People may have

mental systems that occasionally err on the side of caution and assume there is a possibility of others discovering their choices even in supposedly anonymous interactions, and so act as if someone will discover their decision (Delton, Krasnow, Cosmides, & Tooby, 2011). Of course, the value of the resource in question and the potential cost of being caught should influence one's willingness to risk being unfair

When we provided children with a seemingly impartial procedure that allowed them to appear fair to others while being selfish (Experiment 3), they took advantage of the opportunity. Future research should investigate additional strategies children might adopt when attempting to be unfair without appearing so and whether children are strategic enough to devise their own ruses for accomplishing their goal of appearing fair without being prompted to do so – as adults do. In order to avoid paying costs to avoid looking unfair, adults avoid interactions that might make them feel compelled to be generous (Dana et al., 2006), and strategically take more for themselves through omissions rather than commissions (Dana et al., 2007; DeScioli et al., 2011). While this concern with appearing fair may appear early in development, children likely develop more explicit strategies for avoiding the appearance of unfairness as they get older. Future developmental research should investigate whether children are increasingly likely with age to engage in omissions and other strategies to conceal their unfairness, especially in contexts where they are concerned with presenting themselves favorably to others.

The current experiments contribute to research on children's fairness concerns by demonstrating that children modify their behavior in order to improve their reputations with third parties. Although previous studies found some evidence consistent with social signaling, they were not designed to investigate whether children are motivated to gain a reputation with third parties as a generous or fair individual (Buhrmester et al., 1992, Leimgruber et al., in press). In

our experiments recipients were not present, allowing us to specifically investigate children's motivation to appear fair to third parties, an important step forward in understanding how children develop self-presentational concerns. Our approach is more analogous to research in adult impression management, which is often focused on how individuals try to influence strangers' perceptions of them (Baumeister, 1982; Leary et al., 2011), and extends investigations of self-presentation in older children in domains other than fairness (Aloise-Young, 1993; Banerjee, 2002; Hill & Pillow, 2006). It would also be beneficial for future research to investigate whether children's behavior in experiments like these is correlated with measurements of norm internalization or self-presentational motives (Leary & Kowalski, 1990; Rutland et al., 2005).

Finally, our research provides empirical support for the notion that people are especially likely to be unfair when there is a lack of knowledgeable oversight and when they can gain materially. If even young children can radically shift their behavior from fair to unfair based on whether authority figures are aware of their behavior, then it might be naïve to believe that shrewd adults will be fair without similar oversight. By understanding the limitations of fairness, policymakers can discover how to leverage fairness to increase socially desirable behavior in some circumstances, while limiting its occasional wastefulness—i.e., when it causes the needless destruction of resources (Blake & McAuliffe, 2011; Dawes et al, 2007; Shaw & Knobe, in press; Shaw & Olson, 2012). Our results suggest that fair behaviors may be driven partly by people's desire to improve their appearance with others. In cases where appearing fair is possible without behaving fairly, troublingly, some people may focus more on the appearance than the act.

References

- Adams, J. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2, pp. 267-299). New York: Academic Press.
- Aloise-Young PA (1993) The development of self-presentation: Self-promotion in 6-to-10-year-old children. *Social Cognition, 11*, 201-222. doi: 10.1521/soco.1993.11.2.201
- Andreoni, J., & Bernheim, D.B. (2009). Social image and the 50-50 norm: A theoretical and experimental analysis of audience effects. *Econometrica, 77*(5), 1607-1636.
doi:10.3982/ECTA7384
- Apfelbaum, E.P., Pauker, K., Ambady, N., Sommers, S.R., & Norton, M.I. (2008). Learning (not) to talk about race: When older children underperform in social categorization. *Developmental Psychology, 44*, 1513-1518. doi:10.1037/a0012835
- Banerjee, R. (2002). Audience effects on self-presentation in childhood. *Social Development, 11*, 487-507. doi:10.1111/1467-9507.00212
- Barclay, P., & Willer, R. (2007). Partner choice creates competitive altruism in humans. *Proceedings from the Royal Society, B, 272*, 749-753. doi:10.1098/rspb.2006.0209
- Batson, C.D., Kobrynowicz, D., Dinnerstein, J.L., Kampf, H.C., & Wilson, A.D. (1997). In a very different voice: Unmasking moral hypocrisy. *Journal of Personality and Social Psychology, 72*, 1335–1348. doi:10.1037/0022-3514.72.6.1335
- Batson, D., Thompson, E., & Chen, H. (2002). Moral Hypocrisy: Addressing some alternatives. *Journal of Personality and Social Psychology, 83*, 330-339. doi:10.1037/0022-3514.83.2.330
- Baumeister, R. F. (1982). A self-presentational view of social phenomena. *Psychological Bulletin, 91*, 3-26. doi:10.1037/0033-2909.91.1.3

- Bennett, M. & Yeeles, C. (1990). Children's understanding of the self-presentational strategies of ingratiation and self-promotion. *European Journal of Social Psychology*, 20, 455–461.
doi: 10.1002/ejsp.2420200507
- Blake, P. R., & McAuliffe, K. (2011). "I had so much it didn't seem fair": Eight-year-olds reject two forms of inequity. *Cognition*, 120, 215–224. doi:10.1016/j.cognition.2011.04.006
- Blake, P. R., & Rand, D. (2010). Currency value moderates equity preference among young children. *Evolution and Human Behavior*, 31, 210–218.
doi:10.1016/j.evolhumbehav.2009.06.012
- Blau, P. (1964). Justice in social exchange. *Sociological Inquiry*, 34, 193-206.
doi:10.1111/j.1475-682X
- Boehm, C. (2008). Purposive social selection and the evolution of human altruism. *Cross-Cultural Research*, 42, 319-352.
- Bohnet, I., & Frey, B.S. (1999). The Sound of Silence in Prisoner's Dilemma and Dictator Games *Journal of Economic Behavior & Organization*, 38, 43–57.
- Bolton, G. E., Brandts, J., & Ockenfels, A. (2005). Fair procedures: Evidence from games involving lotteries. *Economic Journal*, 115, 1054–1076.
- Bolton, G. E., & Ockenfels, A. (2000). ERC: A theory of equity, reciprocity, and competition. *American Economic Review*, 90, 166–193. doi:10.1257/aer.90.1.166
- Brownell, C., Svetlova, M. & Nichols, S. (2009). To share or not to share: When do toddlers respond to another's needs? *Infancy*, 14, 117-130.
- Buhrmester, D., Goldfarb, J., & Cantrell, D. (1992). Self- presentation when sharing with friends and non-friends. *Journal of Early Adolescence*, 12, 61-79.
doi:10.1177/0272431692012001004

- Chang, S. W. C., Winecoff, A. A., & Platt, M. L. (2011). Vicarious reinforcement in rhesus macaques (*Macaca mulatta*). *Frontiers in Neuroscience*, 5, 1–10.
doi:10.3389/fnins.2011.00027
- Charness, G., & Rabin, M. (2002). Understanding social preferences with simple tests. *Quarterly Journal of Economics*, 117, 817–869. doi:10.1162/003355302760193904
- Damon, W. (1977). *The social world of the child*. San Francisco: Jossey-Bass.
- Dana, J., Cain, D.M., & Dawes, R.M. (2006). What You Don't Know Won't Hurt Me: Costly (But Quiet) Exit in Dictator Games. *Organizational Behavior and Human Decision Processes*, 100, 193-201. doi:10.1016/j.obhdp.2005.10.001
- Dana, J., Weber, R., & Kuang, J. (2007). Exploiting moral wiggle room: Experiments demonstrating an illusory preference for fairness. *Economic Theory*, 33, 67–80.
doi:10.1007/s00199-006-0153-z
- Dawes, C., Fowler, J., Johnson, T., McElreath, R., & Smirnov, O. (2007). Egalitarian motives in humans. *Nature*, 446, 794-796. doi:10.1038/nature05651
- De Cremer, D., & Sedikides, C. (2008) Reputational implications of fairness for personal and relational self-esteem. *Basic and Applied Social Psychology*, 30, 66-75.
doi:10.1080/01973530701866557
- Delton, A.W., Krasnow, M.M., Cosmides, L. & Tooby, J. (2011). Evolution of direct reciprocity under uncertainty can explain human generosity in one-shot encounter. *Proceedings of the National Academy of Sciences*, 108, 13335–13340.
doi:10.1073/pnas.1102131108
- DeScioli, P., Christner, J., & Kurban, R. (2011). The omission strategy. *Psychological Science*, 22, 442-446.

- DeScioli, P. & Kurzban, R. (in press). A solution to the mysteries of morality.
Psychological Bulletin.
- DeScioli, P., & Kurzban, R. (2009a). Mysteries of morality. *Cognition*, *112*, 281-299.
doi:10.1016/j.cognition.2009.05.008
- DeScioli, P., & Kurzban, R. (2009b). The alliance hypothesis for human friendship. *PLoS ONE*, *4*, e5802. doi:10.1371/journal.pone.0005802
- Eisenberg, N., & Fabes, R. A. (1998). Prosocial development (5th ed. In W. Damon & N. Eisenberg (Eds.). *Handbook of child psychology: Social, emotional, and personality development* (Vol. 3, pp. 701–778). Berlin: Springer.
- Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in children. *Nature*, *454*, 1079-1083. doi:10.1038/nature07155
- Fehr, E., Goette, L., & Zehnder, C. (2009). A behavioral account of the labor market: The role of fairness concerns. *Annual Review of Economics*, *1*, 355-384.
doi:10.1146/annurev.economics.050708.143217
- Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics*, *114*, 817-868. doi:10.1162/003355399556151
- Frank, R. (1988). *Passions within reason: The strategic role of the emotions*. New York: W. W. Norton & Co.
- Franzen, A. & Pointner, S. (2012) Anonymity in the dictator game revisited. *Journal of Economic Behavior and Organization*, *81*, 74-81. doi:10.1016/j.jebo.2011.09.005
- Geraci, A. & Surian, L. (2011) The developmental roots of fairness: Infants' reactions to equal and unequal distributions of resources. *Developmental Science*, *14*, 1012-1020.
doi:10.1111/j.1467-7687.2011.01048

- Gurven, M. (2004). Reciprocal altruism and food sharing decisions among Hiwi and Ache hunter-gatherers. *Behavioral Ecology and Sociobiology*, *56*, 366-380.
doi:10.1017/S0140525X04000123
- Guth, W., Huck, S., & Ockenfels, P. (1996). Two-level ultimatum bargaining with incomplete information: an experimental study. *The Economic Journal*, *106*, 593-604.
- Hagen, E.H., & Hammerstein, P. (2006). Game theory and human evolution: a critique of some recent interpretations of experimental games. *Theoretical Population Biology*, *69*, 339-348. doi:10.1016/j.tpb.2005.09.005
- Henrich, J. (2004). Cultural group selection, co-evolutionary processes and large-scale cooperation. *Journal of Economic Behavior and Organization*, *53*, 3-35.
doi:10.1016/S0167-2681(03)00094-5
- Hill, V., & Pillow, B. H. (2006). Children's understanding of reputations. *The Journal of Genetic Psychology*, *167*, 137-157.
- Hook, J., & Cook, T. D. (1979). Equity Theory and the Cognitive Ability of Children. *Psychological Bulletin*, *86*, 429-445. doi:10.1037/0033-2909.86.3.429
- Houser, D., Montinari, N., Piovesan, M. (2012) Private and public decisions in social dilemmas: Evidence from children's behavior. Working paper.
- Hughes J.N., & Zhang, D. (2007) Effects of the structure of classmates' perceptions of peers' academic abilities on children's academic self-concept, peer acceptance, and classroom engagement. *Journal of Contemporary Educational Psychology*.*32*,400–419.
- Kagel, J., Kim, C. & Moser, D. (1996). Fairness in Ultimatum Games with Asymmetric Information and Asymmetric Payoffs. *Games and Economic Behavior*, *13*, 100-110.
doi:10.1006/game.1996.0026

- Kahn, A., & Young, D. L. (1973). Ingratiation in a free social situation. *Sociometry*, 36, 579–587. doi:10.2307/2786253
- Kahneman, D., Knetsch, J.L. & Thaler, R. (1986) Fairness as a constraint on profit seeking: Entitlements in the market. *The American Economic Review*, 76, 728-774. doi: 10.2307/1806070
- Kimbrough, E.O., Sheremeta, R.M., & Shields, T. (2011). Resolving Conflicts by a Random Device. *Working paper*. Retrieved from: http://www.chapman.edu/ESI/wp/Sheremeta-Shields_ResolvingConflictsbyRandomDevice.pdf
- Kümmerli, R., Burton-Chellew, M. N., Ross-Gillespie, A., & West, S. A. (2010). Resistance to extreme strategies, rather than prosocial preferences, can explain human cooperation in public goods games. *Proceedings of the National Academy of Sciences USA*, 107, 10125–10130.
- Kuzmak, S. D., & Gelman, R. (1986). Young children's understanding of random phenomena. *Child Development*, 57, 559–566.
- Larson, T., & Capra, M. (2009). Exploiting moral wiggle room: Illusory preference for fairness? A Comment. *Judgment and Decision Making*, 4, 467-474.
- Latane, B. (1970). Field studies of altruistic compliance. *Representative Research in Social Psychology*, 1, 49–61.
- Leimgruber, K., Shaw, A., Santos, L.R., Olson, K.R. (2012). Young children are more generous when others are aware of their actions. *PLoS-ONE*, 7 (10): e48292
DOI: 10.1371/journal.pone.0048292
- Leary, M. R., Allen, A. B., & Terry, M. L. (2011). Managing social images in naturalistic

- versus laboratory settings: Implications for understanding and studying self-presentation. *European Journal of Social Psychology*, *41*, 411-421. doi: 10.1002/ejsp.81
- Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin*, *107*, 34-47. doi: 10.1037/0033
- Levitt, S., & List, J. (2007). What Do Laboratory Experiments Measuring Social Preferences Tell Us About the Real World?. *The Journal of Economic Perspectives*, *21*, 153-174. doi:10.1257/jep.21.2.153
- LoBue, V., Nishida, T., Chiong, C., DeLoache, J., & Haidt, J. (2011). When Getting Something Good is Bad: Even Three-year-olds React to Inequality. *Social Development*, *20*, 154-170. doi:10.1111/j.1467-9507.2009.00560.x
- Milinski, M., Semmann, D., & Krambeck, H. J. (2002). Donors to charity gain in both indirect reciprocity and political reputation. *Proceedings of the Royal Society of London. Series B, Biological Sciences*, *269*, 881–883. doi:10.1098/rspb.2002.1964
- Mills, C. M., & Grant, M. G. (2009). Biased decision-making: Developing an understanding of how positive and negative relationships may skew judgments. *Developmental Science*, *12*, 784–797.
- Mills, C. M., & Keil, F. C. (2008). The development of (im)partiality. *Cognition*, *107*, 528-551. doi:10.1016/j.cognition.2007.11.003
- Olson, K. R., & Spelke, E. S. (2008). Foundations of cooperation in young children. *Cognition*, *108*, 222-231. doi:10.1016/j.cognition.2007.12.003
- Organ, D.W. (1988) *Organizational citizenship behavior: The good soldier syndrome*. Lexington Books, Lexington, MA.
- Piaget, J. (1932). *The moral judgment of the child*. Oxford, England: Harcourt Brace.

- Reis, H.T., & Gruzen, J. (1976). On mediating equity, equality, and self-interest: The role of self-presentation in social exchange. *Journal of Experimental Social Psychology*, *12*, 487-503. doi: 10.1016/0022-1031(76)90079-2
- Rutland, A., Cameron, L., Milne, A., & McGeorge, P. (2005). Social norms and self-presentation: Children's implicit and explicit intergroup attitudes. *Child Development*, *76*, 451- 466. doi:10.1111/j.1467-8624.2005.00856.x
- Schlottmann, A. (2001). Children's Probability intuitions: Understanding the expected value of complex gambles. *Child Development*, *71*, 103–122
- Schmidt, M.F. & Sommerville, J.A. (2011). Fairness expectations and altruistic sharing in 15-month-old human infants. *PLoS ONE*, *6*, e23223. doi: 10.1371/journal.pone.0023223.g001
- Selman, R. L. (1980). *The growth of interpersonal understanding: Developmental and clinical analyses*. New York: Academic Press.
- Shaw, A., DeScioli, P., & Olson, K.R. (in press). Fairness versus favoritism in children. *Evolution and Human Behavior*.
- Shaw, A. & Knobe, J. (in press). Not all mutualism is fair, and not all fairness is mutualistic. *Behavior and Brain Sciences*.
- Shaw, A. & Olson, K.R. (2012) Children discard a resource to avoid inequity. *Journal of Experimental Psychology: General*, *141*, 382-395.
- Shaw, A. & Santos, L. (2012). Lab support for strong reciprocity is weak: Punishing for reputation rather than cooperation. *Behavior and Brain Sciences*, *35*, 39.
doi:10.1017/S0140525X11000884
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed

- flexibility in data collection and analysis allows presenting anything as significant.
Psychological Science, 22, 1359–1366. doi:10.1177/0956797611417632
- Sigelman, C. K., & Waitzman, K. A. (1991). The development of distributive justice orientations: Contextual influences on children's resource allocations. *Child Development*, 62, 1367–1378. doi:10.1111/j.1467-8624
- Sloane, S., Baillargeon, R., & Premack, D. (2012). Do Infants Have a Sense of Fairness? *Psychological Science*, 23, 196-204. doi :10.1177/0956797611422072
- Svetlova, M., Nichols, S. R., & Brownell, C. A. (2010). Toddlers' prosocial behavior: From instrumental to empathic to altruistic helping. *Child Development*, 81, 1814–1827. doi:10.1111/j.1467-8624.2010.01512.x
- Turiel, E. (2006). The development of morality. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (pp. 789 – 857). Hoboken, NJ: Wiley.
- Tyler, T.R. (1994). Governing amid diversity: The effect of fair decision-making procedures on the legitimacy of government. *Law and Society Review*, 28, 809-831. doi:10.2307/3053998
- Tyler, T.R., & Lind, E.A. (1992). A relational model of authority in groups. In M. Zanna (Ed.), *Advances in experimental social psychology*, Vol. 25 (pp. 151-191). New York: Academic Press.
- Thibaut, J., & Walker, L. (1975). *Procedural justice: A psychological analysis*. Hillsdale, NJ: Erlbaum.
- Tyler, T. R. (2000). Social justice: Outcome and procedure. *International Journal of Psychology*, 35, 117-125.

Foot Notes

1. We report how we determined our sample size, all manipulations, and all measures in the experiments reported here, in line with recommendations by Simmons, Nelson, and Simonsohn (2011). We included 20 participants in each condition of Experiment 1 and 2 since this was the sample size used by Shaw and Olson (2012), the studies upon which these experiments were based; 20 participants per condition meets the sample size requirement suggested by Simmons et al. (2011).
2. An additional 20 participants were assigned to a Transparent Other Condition ($M = 7$ years, 3 months; $SD = 10$ months; 9 females); this condition was identical to the Transparent Self Condition except that the two recipients were third parties. In this condition, children were fair 95% of the time. We do not include these data in the main text because this condition is a close replication of Shaw and Olson (2012), and the results are not informative to our primary account.
3. We included more participants in Experiment 3 than in Experiments 1 and 2 for several reasons. First, we included an older age group (9- to 11-year-olds), which necessitated a larger sample. Second, we collected data from a total of 10 schools; we had decided a priori to include all children in our 6- to 11-year-old age range at these 10 schools in our final sample.

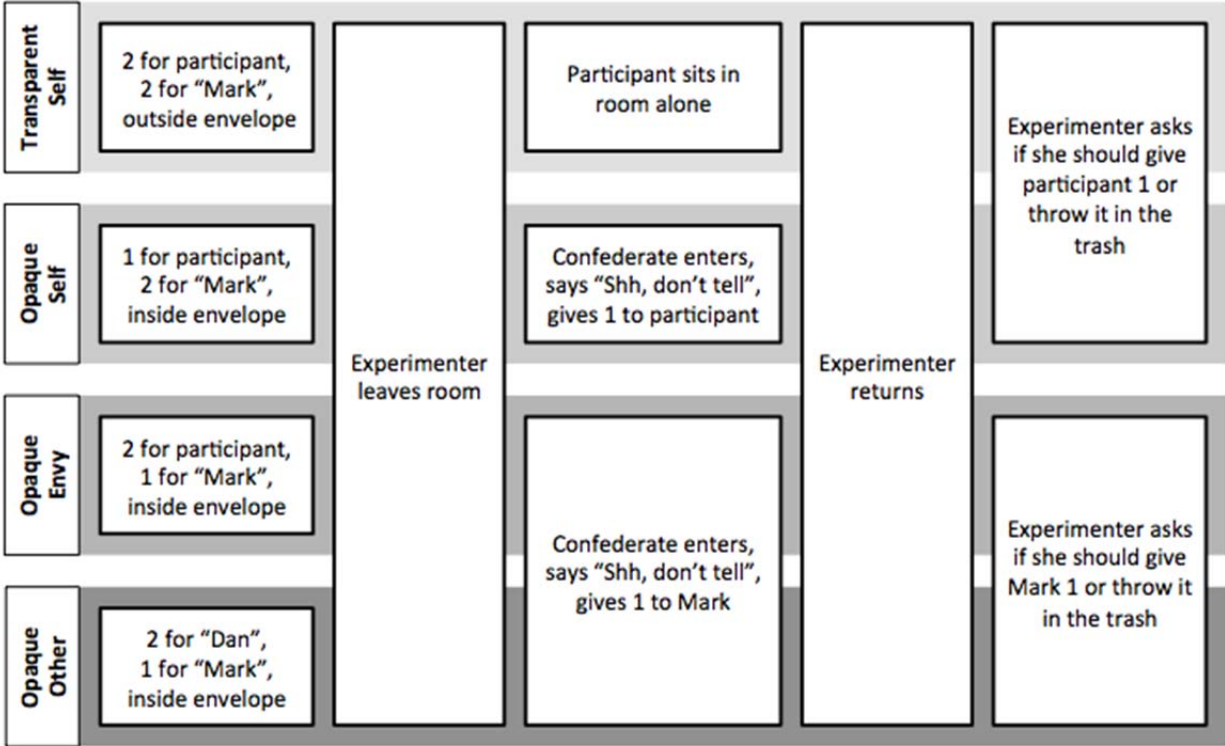


Figure 1: Schematic of the different conditions from Experiment 1. In all conditions the experimenter gives out some erasers to two children for doing a good job answering questions, the differences and similarities between conditions are outlined.

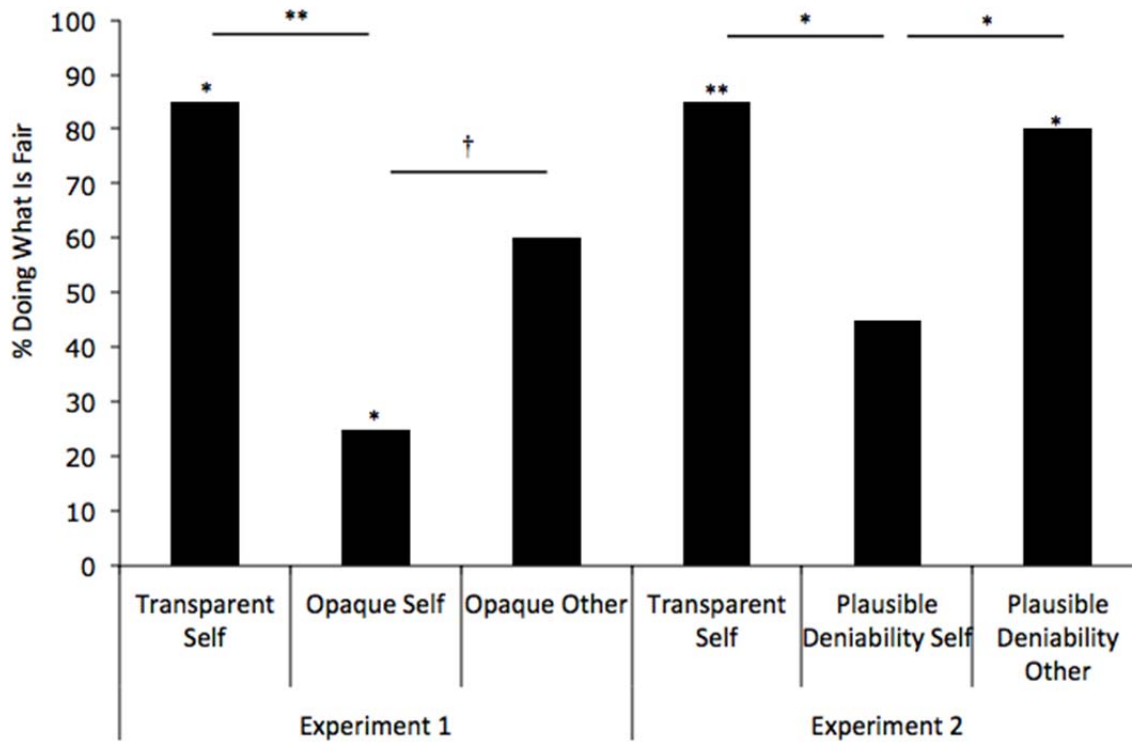


Figure 2: Percentage of participants who did what was fair in the conditions from Experiments 1 and 2. Each condition has 20 participants. † $p = .055$ * $p < .05$, ** $p < .01$

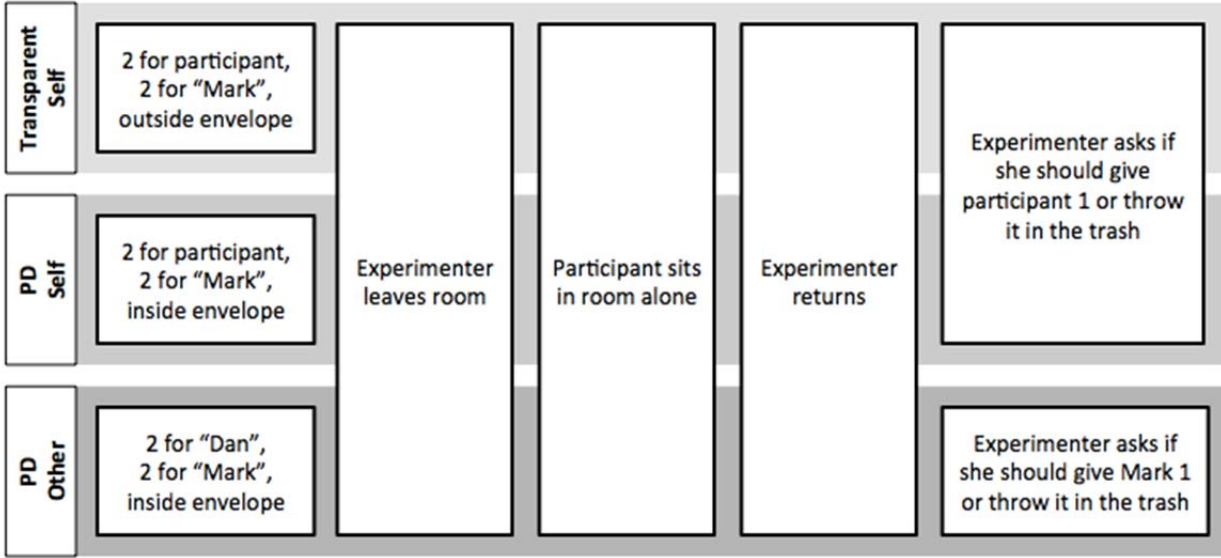


Figure 3: Schematic of the different conditions from Experiment 2. In all conditions the experimenter gives out some erasers to two children for doing a good job answering questions, the differences and similarities between conditions are outlined. PD stands for Plausible Deniability.

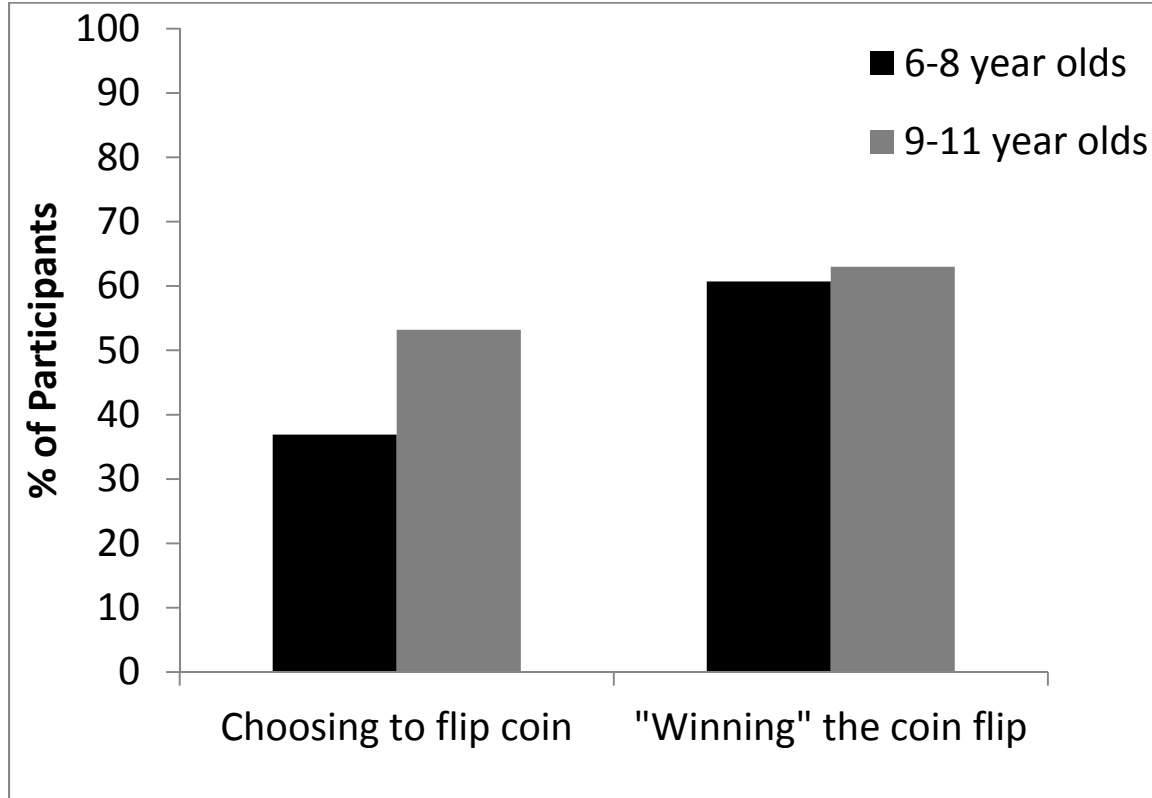


Figure 4. Percentage of children choosing to flip the coin to determine prize assignment as a percentage of children reporting winning the *good prize* after flipping the coin as a function of age in Experiment 3 (both "Winning the coin flip" bars are significantly above chance, 50%).

*** $p < .001$