

# Money Cues Increase Agency and Decrease Prosociality Among Children: Early Signs of Market-Mode Behaviors



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## Abstract

People can get most of their needs broadly satisfied in two ways: by close communal ties and by dealings with people in the marketplace. These modes of relating—termed *communal* and *market*—often necessitate qualitatively different motives, behaviors, and mind-sets. We reasoned that activating market mode would produce behaviors consistent with it and impair behaviors consistent with communal mode. In a series of experiments, money—the market-mode cue—was presented to Polish children ages 3 to 6. We measured communal behavior by prosocial helpfulness and generosity and measured market behavior by performance and effort. Results showed that handling money (compared with other objects) increased laborious effort and reduced helpfulness and generosity. The effects of money primes were not due to the children's mood, liking for money, or task engagement. This work is the first to demonstrate that young children tacitly understand market mode and also understand that money is a cue to shift into it.

## Keywords

money, children, helping, generosity, persistence, performance, prosociality, agency, open data, open materials

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People can get most of their needs satisfied in two ways: by close communal ties and by dealings with others in a marketplace. In order to facilitate interactions in these two spheres, people adopt specific modes of relating to one another (i.e., *communal* and *market* modes), with attendant circumscribed behaviors, social roles, mind-sets, and motives (Clark & Mills, 1993; Fiske, 1992). People in communal relationships readily share resources, which is a key reason why early humans staved off starvation, kept safe, and reproduced (Baumeister & Leary, 1995). Humans also benefit enormously from interactions with people outside their own close social networks, such as through trade. Trade afforded access to new and diverse resources that conferred widespread gains (Smith, 1776/1904). The advent of money enabled trade to flourish (Weatherford, 1998) and introduced new guidelines for feelings, thoughts, and behaviors (Fiske, 1992).

The fact that almost anything can be bought and sold makes money a marquee symbol of the market (Sandel, 2012). Money is such a strong symbol of the market that even subtle cues of money can bring behavior in line with market mode. This could explain experimental findings showing that being reminded of money (vs. other concepts) improves motivation and performance on competency tasks. Additional findings indicate that money cues weaken prosocial behaviors (Vohs, Mead, & Goode, 2006; see Vohs, 2015), which implies that market mode could hinder communal action.

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The effects of money primes have been replicated in independent laboratories in numerous countries (e.g., Chatterjee, Rose, & Sinha, 2013; Gasiiorowska & Helka, 2012; Guéguen & Jacob, 2013; Pfeffer & DeVoe, 2009; Roberts & Roberts, 2012; Vohs, 2015). Yet that work has focused almost exclusively on adults, who possess a substantial amount of knowledge about money. It remains unclear whether money cues can produce market-mode behaviors in the absence of money knowledge.

We studied a population that does not understand money—children ages 3 to 6—to test the effects of the psychological meaning of money without the confound of its economic meaning. Children ages 3 to 5 know that money is different from other objects and is related to purchasing. Until around age 7, however, children cannot identify denominations or money's functions (Webley, 2005; see also Tables S2 and S3 in Supplemental Results in the Supplemental Material available online). Therefore, children ages 3 to 6 are ideal candidates to test whether money cues can change behavior independently of money knowledge.

Modes of relating to other people, including market and communal modes, serve social coordination. They do so through guidelines that indicate the expected behaviors. Markets consist of roles (e.g., buyers, sellers, bosses, workers) and evoke analytical processes, such as proportionality and cost-benefit assessments (Fiske, 1992). Do young children possess the capacity to detect and perform behaviors expected in market mode? It seems so. They understand social roles starting at around ages 3 to 4 (Watson & Fischer, 1980), and this implies that they form expectations about appropriate behaviors in particular situations. Additionally, young children view other people's behavior in a manner that suggests they engage in cost-benefit assessments. Toddlers interpret the degree of effort that an actor exerts as indicating motivation to achieve a desired outcome (Jara-Ettinger, Tenenbaum, & Schulz, 2015). Also, children as young as 3 can comprehend proportions and allocate resources accordingly (Kanngiesser & Warneken, 2012; Shafer, Haun, & Tomasello, 2015). Together, these capacities might be the social-cognitive building blocks of a market-mode mentality.

Young children seem ready to use communal mode as well. For example, in one study, infants were more likely to spontaneously help after seeing two dolls facing each other (a communality cue) than after seeing two dolls back-to-back or only one doll (Over & Carpenter, 2009). As children grow older, they apply communal motivations to diverse interactions (Clark & Jordan, 2002; Pataki, Shapiro, & Clark, 1994).

Why might market-mode mentality impede communal behaviors? Communal behaviors often are motivated by perceived similarities between oneself and others (Clark,

1984; Fiske, 1992). Because marketplaces hinge on roles, they might make differences among people salient. This reasoning suggests that having, holding, seeing, or thinking about money can inhibit communal behaviors.

## The Present Research

Given that young children are sensitive to key markers of market and communal modes and can alter their behavior accordingly, we predicted that money cues would strengthen their market-mode behaviors and weaken their communal-mode behaviors. In a series of experiments, we tested whether young children (ages 3–6 years;  $N = 476$ ) would exhibit behaviors congruent with market mode and incongruent with communal mode after being reminded of money, which we operationalized as handling money (Zhou, Vohs, & Baumeister, 2009). In Experiments 1 and 2, we operationalized market behavior as task-directed effort and performance, because motivation and achievement on structured tasks are hallmarks of market mode (Fiske, 1992; Heyman & Ariely, 2004). In Experiment 4 (and the pilot study reported in the Supplemental Material), we measured taking rewards, which is a market-mode indicator insofar as it reflects self-interested behavior (Fiske, 1991). In Experiments 3a, 3b, and 4 (and the pilot study), we measured noncontingent helping and generosity, two fundamental communal behaviors (Clark & Jordan, 2002).

Our pilot study of 74 American children ages 3 through 6 (recruited from summer camps and schools; see Pilot Study in the Supplemental Material) showed that the longer the children handled money, the less helpful and generous they were, and the more rewards they took. We then conducted five experiments in Poland that support causal claims. Poland is notable as a research setting because much of the research on money priming has been conducted in North America (Vohs et al., 2006), which has a markedly freer economic climate (Heritage Foundation, 2015). To see similar patterns across diverse settings would suggest generalities in the psychology of money.

Children participating in the five experiments were recruited from preschools in the Lower Silesia region of Poland; a different preschool was used for each study. The experiments had between-subjects designs, and children were randomly assigned to conditions. In each case, we recruited as many children as we could before the school's end date; therefore, sample sizes were not predetermined. We obtained consent from school leaders and parents, as well as assent from the children (all children assented). All children whose parents gave informed consent were tested. The children understood that they would receive rewards for participating regardless of what happened in the session. All the children correctly



**Fig. 1.** Materials used as stimuli in Experiments 1, 2, 3a, 3b, and 4: examples of the coins, buttons, paper circles, banknotes, pieces of paper, and candies.

performed the tasks used as experimental manipulations. No data were discarded.

### Experiment 1: Money Cues and Task Performance and Persistence

Experiment 1 tested whether handling money, as opposed to neutral objects, would improve effort and performance (Fiske, 1992). This idea is grounded in work showing that although either market or communal motives can result in laborious effort, situations that commingle market and communal cues produce outcomes in line with pure market-based situations (Heyman & Ariely, 2004). We predicted that children primed with money would produce better work than children who handled neutral objects (which would replicate findings that Vohs et al., 2006, obtained with adults).

### Method

**Participants and design.** Sixty-eight children ages 4 through 6 (46 boys, 22 girls; mean age = 5.07 years,  $SD = 0.82$ ) participated individually in a two-condition experiment (money vs. neutral cues).

**Procedure.** Children randomly assigned to the money condition ( $n = 32$ ) sorted 25 coins in three denominations: 1, 2, and 5 Polish zloty (PLN; the exchange rate at the time of the experiments was ~1 PLN = \$0.316 U.S.).

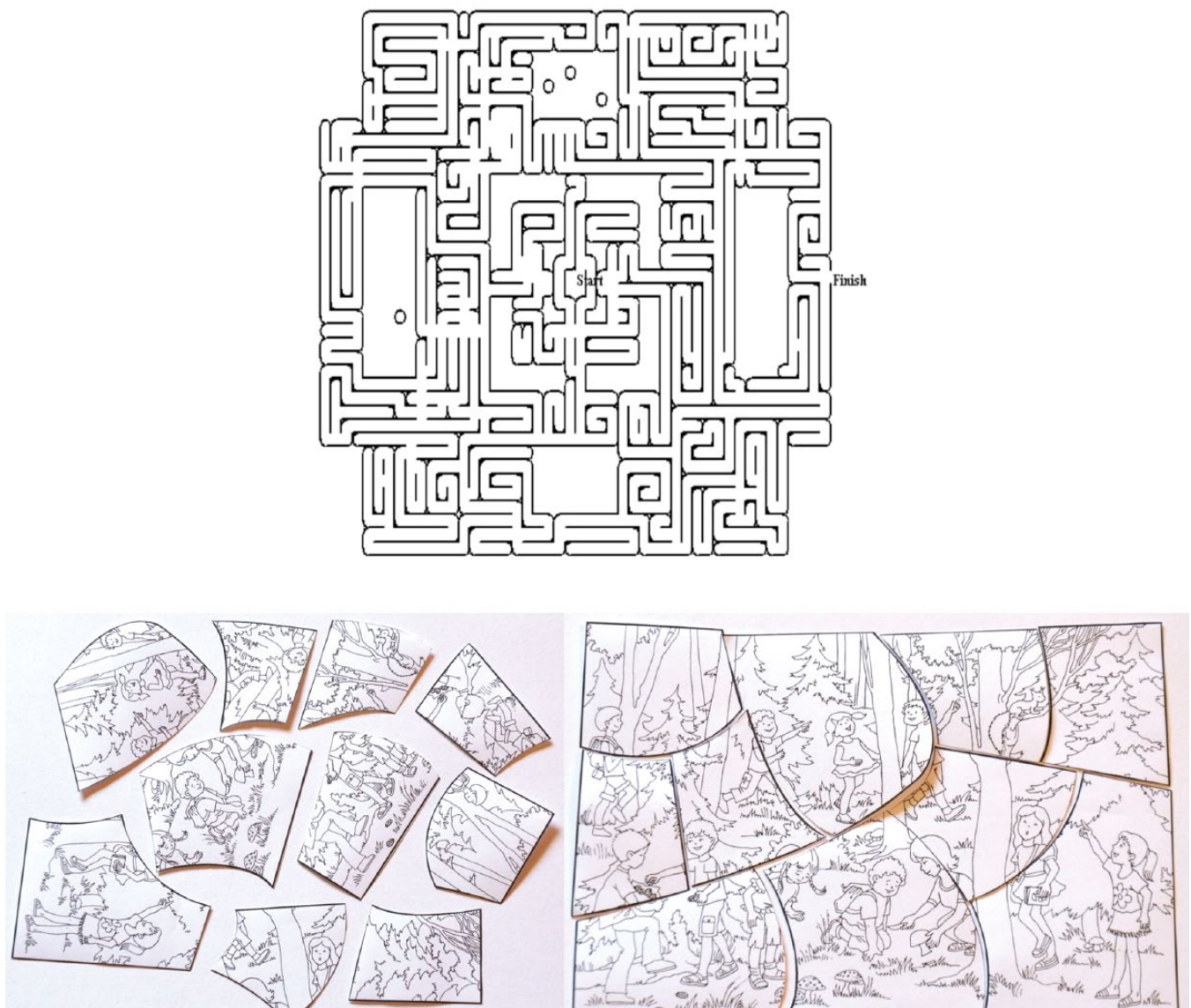
Children in the neutral condition ( $n = 36$ ) sorted 25 buttons of three colors (in sizes similar to the coins'; Fig. 1).

Next, the children moved to another room and met a new experimenter (blind to condition and the experimental hypotheses), who gave them a paper labyrinth puzzle (Fig. 2). The children were instructed to use a pencil to draw a line through the labyrinth from the start to the finish without crossing or touching the lines that represented the labyrinth's walls. They also had an eraser to correct their work if desired. The children were told to finish the task, but that they could stop anytime or get help from the experimenter if they wanted assistance (instructions adopted from Vohs et al., 2006). After the children correctly repeated the instructions, they began working, and we surreptitiously video-recorded them.

One key outcome was persistence. It was operationalized in two ways. First, eight judges, blind to condition and hypotheses, independently watched the videos of the children and timed the children from when they started working until when they stopped working entirely, asked for help, or reached the preset time limit of 10 min. Agreement among the judges was high (intraclass correlation coefficient, or ICC = .94). Duration of work was calculated as the mean of all eight judges' times.<sup>1</sup>

Second, the same eight judges independently indicated whether each child worked until the preset time limit (0 = no, 1 = yes). Again, agreement among the judges was high (ICC = .95). The dependent variable of working the maximum time was a binary coding of





**Fig. 2.** Materials used as the persistence tests: the labyrinth puzzle from Experiment 1 (top) and jigsaw puzzle from Experiment 2 (bottom).

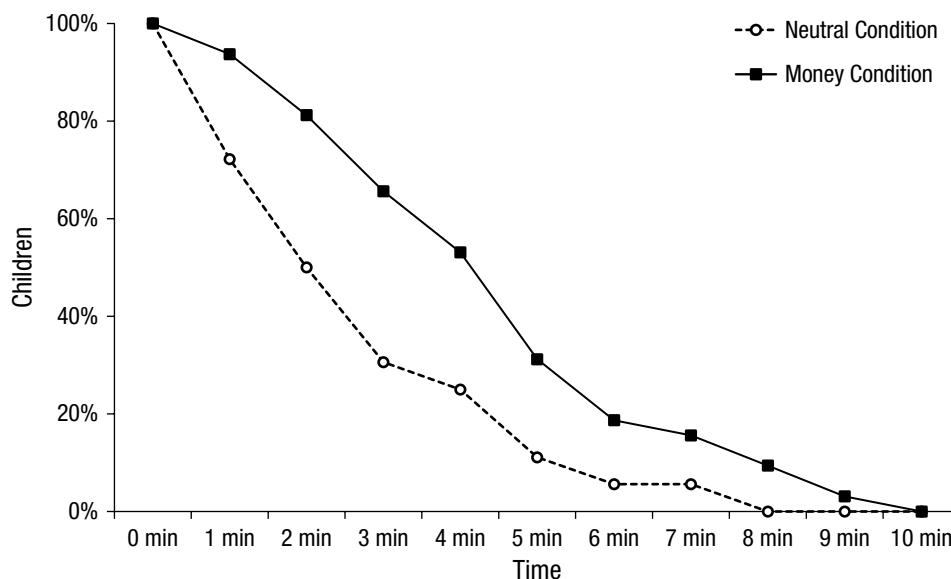
whether the modal judgment from all eight judges was that the child worked until the time limit; it was dummy-coded as 0 (four or fewer judges indicated that the child worked the maximum time) or 1 (five or more judges indicated that the child worked the maximum time).

The second key outcome was objective performance. Coders made binary judgments of whether the children completed the puzzle, which was operationalized as drawing a clear line down the correct path to the answer (0 = no, 1 = yes). Two other judges, blind to condition, independently judged 22% of the labyrinths. Agreement between judges was 100%. After the reliability of the coding scheme was confirmed, one judge assessed all the children's performance on the labyrinth.

## Results

**Persistence.** As predicted, there was a significant effect of condition on persistence as measured by the duration of work,  $t(66) = 3.15$ ,  $p = .002$ , Cohen's  $d = 0.96$ . Children who handled money worked longer ( $M = 251.73$  s,  $SD = 148.89$ , 95% confidence interval, or CI = [198.05, 305.41]) than children who handled buttons ( $M = 150.11$  s,  $SD = 116.19$ , 95% CI = [110.8, 189.42]; Fig. 3).<sup>2</sup>

Descriptive statistics fill in the picture. Whereas 12.5% of the children in the money condition ( $n = 4$ , 95% CI = [5.0%, 28.1%]) worked until the maximum time limit, none of the children in the neutral condition did ( $n = 0$ , 95% CI = [0%, 9.6%]),  $\chi^2(1, N = 68) = 4.78$ ,  $p = .029$ ,



**Fig. 3.** Results from Experiment 1: persistence of the children in the money and neutral conditions ( $N = 68$ ). For each number of minutes indicated on the  $x$ -axis, the graph shows the percentage of children who worked at least that amount of time.

$\chi^2_{\text{Yates}}(1, N = 68) = 2.79, p = .095$ ; Fisher exact test:  $p = .044$ .

**Performance.** Performance mirrored persistence. As predicted, there was a significant effect of condition on correct completion of the task,  $\chi^2(1, N = 68) = 5.95, p = .015$ ,  $\chi^2_{\text{Yates}}(1, N = 68) = 4.25, p = .039$ ; Fisher exact test:  $p = .022$ . Among the children exposed to money, 21.9% ( $n = 7$ , 95% CI = [11%, 38.8%]) correctly completed the labyrinth; in contrast, only 2.8% of the children in the neutral condition did so ( $n = 1$ , 95% CI = [0.5%, 14.2%]). Moreover, the effect of money priming on children's performance was fully mediated by their persistence: Children primed with money worked longer on the labyrinth task, which led them to better solutions (see Supplemental Results in the Supplemental Material).

## Discussion

In summary, our findings in Experiment 1 supported the prediction that the mere presence of money would elicit behaviors associated with market mode, operationalized as laborious effort and accurate performance. Young children were instructed to handle money or buttons. Afterward, they worked on a difficult puzzle with the option to quit or request help. As predicted, children whose initial task involved handling money, as opposed to buttons, achieved better work outcomes. The desirable effects of exposure to money were seen across multiple indicators, including working until the maximum time allowed and producing accurate output.

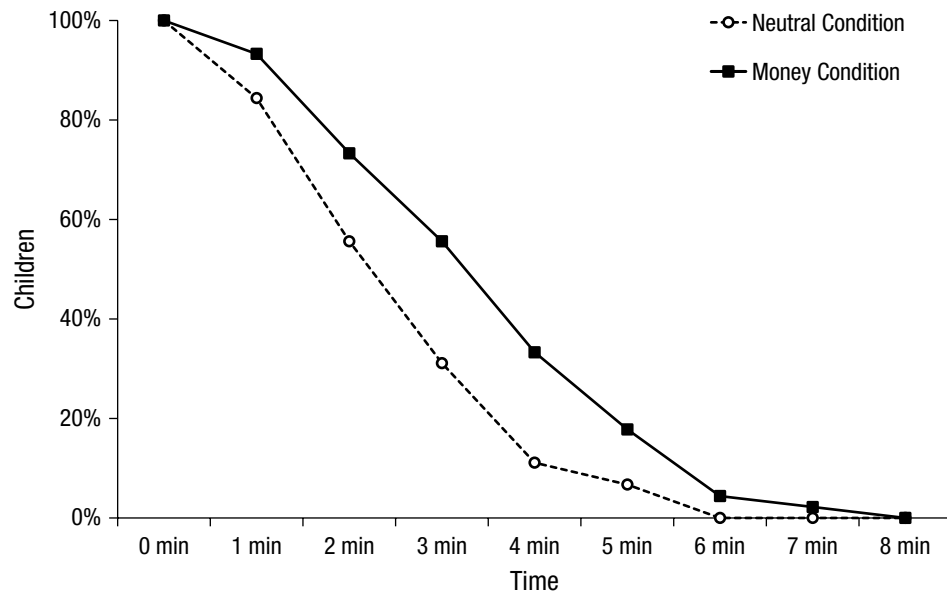
## Experiment 2: Testing Persistence on an Unsolvable Task and Measuring Mood

Experiment 2 replicated the method of Experiment 1 with two improvements. First, the puzzle we used was created for children several years older than our participants (Kwasniewska & Zaba-Zabinska, 2012). Given that solving it was out of range (indeed, none of the children solved it), the puzzle acted as a proxy for an unsolvable task (similar to the task used in Vohs et al., 2006). We predicted that children reminded of money would work on the puzzle longer than others. Second, we tested whether handling money would change children's mood, which could affect persistence. Given that work with adults consistently has found that their mood does not change after exposure to a money prime (e.g., Boucher & Kofos, 2012; Vohs et al., 2006; Zhou et al., 2009), we predicted that condition would have no effect on mood in our participants.

## Method

**Participants and design.** Ninety children ages 4 and 5 years (43 boys, 47 girls; mean age = 4.53 years,  $SD = 0.50$ ) participated individually in a two-condition experiment (money vs. neutral cues).

**Procedure.** Children randomly assigned to the money condition ( $n = 45$ ) sorted 30 coins in three denominations (1, 2, and 5 PLN). Children in the neutral condition



**Fig. 4.** Results from Experiment 2: persistence of the children in the money and neutral conditions ( $N = 90$ ). For each number of minutes indicated on the  $x$ -axis, the graph shows the percentage of children who worked at least that amount of time.

( $n = 45$ ) sorted 30 paper circles (similar in size to the coins) in three colors (Fig. 1). Next, the children reported their mood by answering the question, “Please tell me how you feel now: bad, so-so, or good?” (coded as 1, 2, and 3, respectively; Ialongo, Edelsohn, & Kellam, 2001).

Next, the children moved to another room, where a new experimenter (blind to condition and hypotheses) gave them a jigsaw puzzle (Fig. 2). The children were told that they should try to put the entire puzzle together but could stop anytime or ask for help. After the children correctly repeated the instructions, they began working, and the experimenter surreptitiously timed how long they worked. Timing stopped when the children quit working, asked for help, or reached the preset limit of 10 min. Persistence was measured by time spent working on the puzzle.

## Results

**Persistence.** As predicted, the children exposed to money persisted longer ( $M = 199.74$  s,  $SD = 98.84$ , 95% CI = [170.05, 229.44]) than the children who sorted paper circles ( $M = 143.39$  s,  $SD = 78.84$ , 95% CI = [119.71, 167.08]; Fig. 4),  $t(88) = 2.99$ ,  $p = .004$ , Cohen’s  $d = 0.64$ .

**Mood.** As expected, reported feelings did not differ significantly by condition, Mann-Whitney  $U = 954$ ,  $p = .240$ . An analysis of covariance with mood scores as a covariate showed no significant effect of mood on persistence,  $F(1, 87) = 0.12$ ,  $p = .72$ . Also as predicted, the effect of

condition remained significant when we controlled for mood,  $F(1, 87) = 8.97$ ,  $p = .004$ ,  $\eta_p^2 = .09$ .

## Discussion

In summary, 4- to 5-year-olds who sorted money, as opposed to papers, put in extra effort on a difficult task. This finding replicates Experiment 1 and findings with adults (e.g., Vohs et al., 2006). We measured mood and ruled out mood differences as an alternative explanation of the results.

Our findings in Experiments 1 and 2 hint at attenuated communal motivation in the money condition, in that the children were offered the chance to receive help but seemed to prefer working on their own. Accepting help on a noncontingent basis is an important component of communal relationships (Clark, Dubash, & Mills, 1998). In the next three experiments, we directly tested whether money reminders weaken communal behavior.

## Experiments 3a and 3b: Money Cues and Behavioral Helpfulness

Experiments 1 and 2 supported the prediction that market-mode behaviors, measured by persistence and performance on structured tasks, would emerge more strongly after children were reminded of money than after they were exposed to other cues. Experiments 3a and 3b took a different tack, testing whether money cues hinder communal behaviors. We predicted that

handling money, as opposed to other objects, would reduce children's helpfulness. Such an effect would replicate findings obtained with adults (e.g., Vohs et al., 2006).

Another aim was to test whether the predicted effect hinged on knowledge of money. We assessed money knowledge explicitly (Experiment 3a) and by systematically exposing children to money of higher versus lower value (Experiment 3b). We predicted that these economic aspects of money would not moderate the effect of money cues on helping.

### Experiment 3a

#### Method

*Participants and design.* One hundred twenty-nine children ages 4 through 6 (66 boys, 63 girls; mean age = 5.02 years,  $SD = 0.83$ ) participated in a two-condition (money vs. neutral) between-participants experiment.

*Procedure.* The children's first task was a sorting game, in which they sat at a table with 30 objects and were instructed to sort them. Children in the money condition ( $n = 64$ ) were given 1-, 2-, and 5-PLN coins (10 each). Children in the neutral condition ( $n = 65$ ) were given similarly sized buttons in three colors (10 in each color; Fig. 1).

Next, the children moved to another room, where they met a new experimenter (blind to condition and hypotheses), who asked for help readying a task for another child. She asked the children to bring her as many red crayons as they could from a box in the far corner of the room, indicating that bringing more red crayons would be more helpful. After the children correctly repeated the instruction, the experimenter handed them a basket with which to retrieve the crayons. The number of crayons retrieved (akin to the measure in Vohs et al., 2006) was the measure of helpfulness.

We returned in 4 weeks to give the children a commonly used knowledge test that pits the number of money pieces against their value (Strauss, 1952). The experimenter showed the children two 2-PLN coins and one 5-PLN coin and asked them to indicate which set represented more money. We scored their choice as 1 if they chose the 5-PLN coin and as 0 if they chose the two 2-PLN coins. Then, the experimenter placed five 5-PLN coins, two 20-PLN bills, and one 50-PLN bill as separate groups in front of the children and asked which group would buy the most candy. We scored the children's choice as 1 if they chose the 50-PLN bill and as 0 if they chose either of the other options. We tallied the points to arrive at a final score for each child. The conceptual and empirical range of this score was from 0 to 2.

#### Results

*Helpfulness.* As predicted, the children who had sorted money brought the experimenter fewer crayons ( $M = 14.73$ ,  $SD = 5.77$ , 95% CI = [13.29, 16.18]) than did the children who had sorted buttons ( $M = 22.89$ ,  $SD = 7.41$ , 95% CI = [21.06, 24.73],  $t(127) = 6.97$ ,  $p < .001$ , Cohen's  $d = 1.24$  (Fig. 5).

*Money knowledge.* Almost half of the children failed to answer both knowledge questions correctly (49.6%,  $n = 64$ ), and only a few answered both questions correctly (6.2%,  $n = 8$ ; for details, see Supplemental Results in the Supplemental Material). As expected, money-knowledge score did not significantly moderate the effect of condition on helpfulness. A regression predicting number of crayons retrieved as a function of condition, money-knowledge score ( $z$ -scored), and their interaction showed that the interaction effect was not significant,  $\beta = -0.08$ ,  $SE = 0.07$ , 95% CI = [-0.22, 0.06],  $t = 1.11$ ,  $p = .27$ , partial  $R^2 = .006$ . This analysis also confirmed the significant predicted effect of condition,  $\beta = -0.52$ ,  $SE = 0.07$ , 95% CI = [-0.66, -0.38],  $t = 7.26$ ,  $p < .001$ , partial  $R^2 = .27$ .

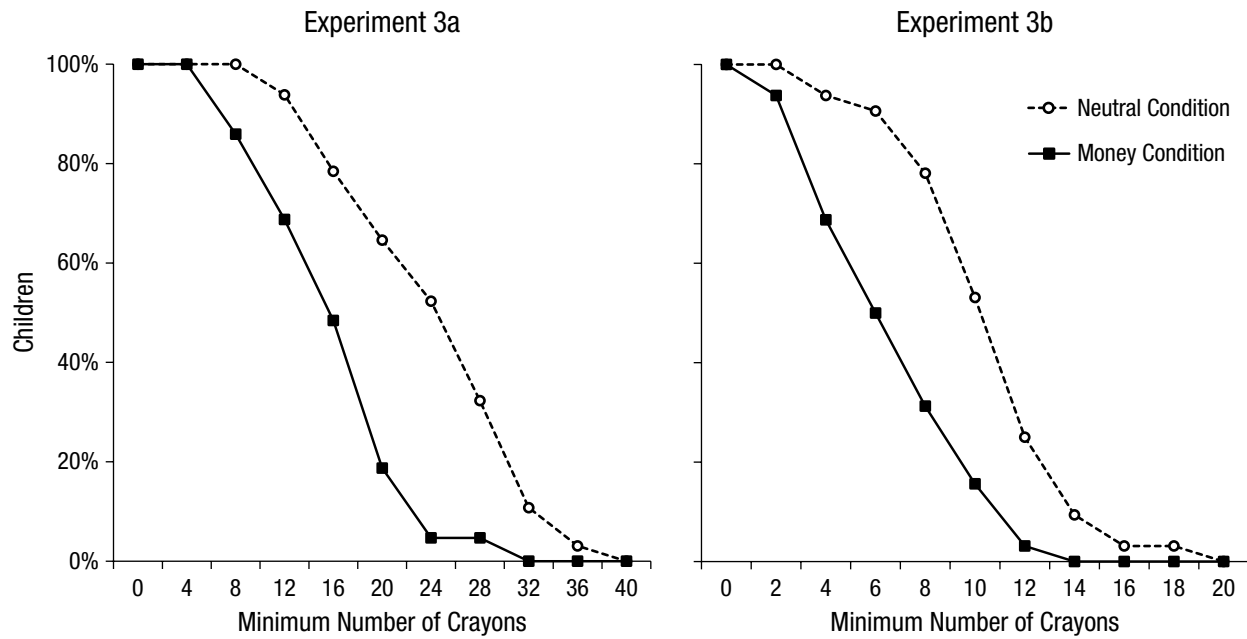
We found a significant effect of the money prime regardless of whether the children answered the money-knowledge questions correctly. Among children who answered neither question correctly, those who were primed with money retrieved fewer crayons ( $M = 13.58$ ,  $SD = 5.11$ , 95% CI = [11.77, 15.39]) than did those who were primed with buttons ( $M = 20.16$ ,  $SD = 6.80$ , 95% CI = [17.67, 22.65]),  $t(62) = 4.40$ ,  $p < .001$ , Cohen's  $d = 1.12$ . Likewise, among children who answered one or both of the money-knowledge question correctly, those who were primed with money retrieved fewer crayons ( $M = 15.97$ ,  $SD = 6.25$ , 95% CI = [13.68, 18.26]) than did those who were primed with buttons ( $M = 25.38$ ,  $SD = 7.14$ , 95% CI = [22.71, 28.05]),  $t(63) = 5.63$ ,  $p < .001$ , Cohen's  $d = 1.42$ .

### Experiment 3b

#### Method

*Participants and design.* Sixty-four 3-year-olds (35 boys) participated individually in a 2 (prime: money vs. neutral)  $\times$  2 (object shape, which instantiated our manipulation of money value in the money condition: round vs. rectangle) between-participants experiment.

*Procedure.* The children's first task was a sorting game similar to that in Experiment 3a. They were given 20 money items or neutral objects, depending on condition ( $n = 16$  in each condition). The children in the money conditions sorted 1- and 5-PLN coins (10 in each denomination, for a total value of 60 PLN) or 10- and



**Fig. 5.** Results from Experiments 3a ( $N = 129$ ; left) and 3b ( $N = 64$ ; right): helpfulness of the children in the money and neutral conditions. For each number of crayons, the graphs show the percentage of children who brought the experimenter at least that many.

20-PLN banknotes (10 in each denomination, for a total value of 300 PLN). The children assigned to the neutral conditions sorted either buttons (in sizes similar to those of the coins) or colored paper slips with printed numbers that matched the notes' denominations (Fig. 1).

After the sorting task, the children moved to another room, where they met a new experimenter (blind to condition and hypotheses). The experimenter asked the children to help her by bringing her as many red crayons as they could, as in Experiment 3a. The number of crayons retrieved was the measure of helpfulness.

## Results

**Helpfulness.** As predicted, the children exposed to money brought over fewer crayons ( $M = 5.72$ ,  $SD = 3.17$ , 95% CI = [4.62, 6.84]) than did the children exposed to neutral objects ( $M = 9.50$ ,  $SD = 3.31$ , 95% CI = [8.38, 10.62]),  $t(62) = 4.66$ ,  $p < .001$ , Cohen's  $d = 1.18$  (Fig. 5). This replicates prior work in adults (Vohs et al., 2006), as well as Experiment 3a.

**Manipulation of money's value.** Ancillary analyses of the money conditions revealed that the manipulation of money's value (via sorting currency worth more vs. less) did not significantly predict the number of crayons retrieved, Mann-Whitney  $U = -0.19$ ,  $p = .867$ , Cohen's  $d = 0.06$ . Thus, coins of lower value and notes of higher value produced similar outcomes.

## Discussion

In summary, Experiments 3a and 3b showed that handling money, as opposed to buttons or paper, hampered helpfulness among children ages 3 to 6. Given that helpfulness is a hallmark communal behavior, these findings suggest that market-mode cues can hinder communal strivings. Experiments 3a and 3b also demonstrated that the effect of money priming on helpfulness was not driven by the economics of money (operationalized as money knowledge in Experiment 3a and variations in money's value in Experiment 3b). Together, these findings suggest that thinking about money inhibit communal goals in children ages 3 to 6.

## Experiment 4: Money, Candies, and Donations

Experiments 3a and 3b showed that handling money impeded helpfulness, a classic communal behavior. Experiment 4 replicated and extended that work using another measure of communal motivation—noncontingent giving (Clark & Jordan, 2002). Among adults, reminders of money reduce donations of cherished resources, such as time or money (e.g., Gasiorowska & Helka, 2012; Liu & Aaker, 2008; Vohs et al., 2006). In Experiment 4, we gave children the chance to donate stickers, which they typically cherish (Samuels, Brooks, & Frye, 1996).



In this experiment, we altered the recipient of participants' communal actions. Instead of the experimenter needing help (as in Experiments 3a and 3b), it was other children who needed help. This change addresses a potential explanation for the prior findings, because the experimenter was an authority enacting a role patently different from the children's role, which could have stunted their communal motivations. Because communality occurs often with similar others (Clark & Mills, 2012; Fiske, 1991), giving to peers was an especially appropriate measure.

The design of Experiment 4 allowed us to test another outcome, taking rewards. The children could choose up to six stickers for themselves prior to the donation opportunity. We assessed whether money cues stimulated a desire for rewards more than other conditions did. Money cues attune adults to potential self-benefits (Reutner & Wänke, 2013), and more directly, our pilot study with American children (see the Supplemental Material) indicated that children exposed to money for a longer time took more rewards. Hence, we predicted that children reminded of money would take more stickers than other children would.

Finally, Experiment 4 tested a desirability explanation, according to which the effect of exposure to money on helpfulness is due to money's desirability. Children's greater liking of money than buttons could reduce their communal behavior in the money condition. To this end, we instructed some children to sort candies, which they liked more than sorting other items. If desirability of the prime is what reduces communal behavior, then children who have sorted candies should donate less than those who have sorted money or buttons. If money cues reduce communal behavior, as we predicted, then children who have handled money should donate less than those who have sorted candies or buttons. For additional tests of alternative explanations, we measured mood, liking of the sorting task, and the time the children spent sorting.

## Method

**Participants.** One hundred twenty-five children ages 3 to 6 years (57 boys, 68 girls; mean age = 5.09 years,  $SD = 0.87$ ) participated individually in a three-condition experiment (money vs. buttons vs. candies).

**Procedure.** The children were randomly assigned to the three conditions ( $n_s = 42, 42$ , and 41 in the money, candies, and buttons conditions, respectively). They sat at a table with 30 coins (in three denominations), 30 candies (in three colors), or 30 buttons (in three colors; Fig. 1) and sorted them, as in the previous experiments. The time they spent sorting the items was surreptitiously recorded.

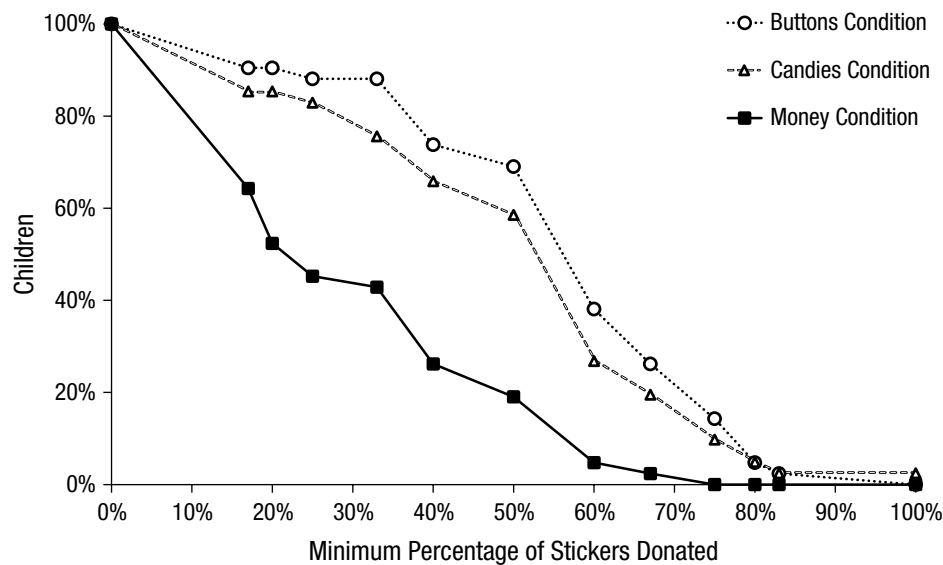
After the sorting task, the children were shown the Faces Scale, which consists of seven drawings of expressions, ranging from a very sad to a very happy expression (from Andrews & Withey, 1976). The children selected a face to respond to each of two questions (in counterbalanced order): "How do you feel right now?" and "How much did you like the sorting game?" (saddest face scored as 1, happiest face scored as 7).

The children then moved to another room, where they met a new experimenter (blind to condition and the study's purpose), who showed them six Disney cartoon-character stickers. The children were informed that they could take as many of the six stickers as they wanted, and that the experimenter would keep the remainder. The number of stickers taken was our first dependent variable, a measure of self-interest typical for market mode (Fiske, 1992). Next, the experimenter hid the remaining stickers and told the children that the stickers they chose were theirs. She explained that they could give as many of their stickers as they wanted to other children from their preschool who did not participate or could keep all the stickers they had chosen for themselves. The percentage of stickers donated was our measure of communality.

## Results

**Donations.** Because the number of stickers taken differed across participants (see the next section), we tested the hypothesis that the children reminded of money would show weaker communality than the other children by examining the percentage of stickers donated, rather than the number of stickers donated. As predicted, an analysis of variance (ANOVA) showed a significant effect of condition,  $F(2, 122) = 16.25, p < .001, \eta^2 = .21$ . Planned comparisons indicated that the money-primed children donated a smaller percentage of their stickers ( $M = 22.58\%$ ,  $SD = 20.61$ , 95% CI = [15.8%, 29.3%]) than did those in the buttons condition ( $M = 48.73\%$ ,  $SD = 21.58$ , 95% CI = [42.0%, 55.5%]),  $F(1, 122) = 29.24, p < .001, \eta^2 = .19$ ; (Fig. 6); this result conceptually replicates our findings in Experiments 3a and 3b. In addition, the money-primed children donated a lower percentage of their stickers than did the children who sorted candies ( $M = 43.29\%$ ,  $SD = 24.19$ , 95% CI = [36.4%, 50.1%]),  $F(1, 122) = 18.122, p < .001, \eta^2 = .13$  (Fig. 6). There was no significant difference between the two neutral (nonmoney) conditions,  $F(1, 122) = 1.25, p = .266$ .

Analyses of extreme selfishness, operationalized as the percentage of children who donated none of their stickers, illuminated the effects of exposure to money. Extreme selfishness differed by condition,  $\chi^2(2, N = 125) = 10.10, p = .006$ . It was more frequent in the money condition ( $n = 15, 35.7\%$ , 95% CI = [23.0%, 50.8%]) than in the buttons



**Fig. 6.** Results from Experiment 4: donations of the children in the money, buttons, and candies conditions ( $N = 125$ ). For each percentage of stickers, the graph shows the percentage of children who donated at least that percentage of the stickers they had taken.

condition ( $n = 4$ , 9.5%, 95% CI = [3.8%, 22.1%]),  $\chi^2(1, N = 84) = 8.23$ ,  $p = .004$ ,  $\chi^2_{\text{Yates}}(1, N = 84) = 6.80$ ,  $p = .004$ , Fisher exact test:  $p = .008$ , and the candies condition ( $n = 6$ , 14.6%, 95% CI = [6.9%, 28.4%]),  $\chi^2(2, N = 83) = 4.88$ ,  $p = .027$ ,  $\chi^2_{\text{Yates}}(1, N = 83) = 3.826$ ,  $p = .050$ , Fisher exact test:  $p = .042$ . The two neutral conditions did not differ significantly from each other,  $\chi^2(1, N = 83) = 0.51$ ,  $p = .475$ ,  $\chi^2_{\text{Yates}}(1, N = 83) = 0.14$ ,  $p = .709$ , Fisher exact test:  $p = .520$ .

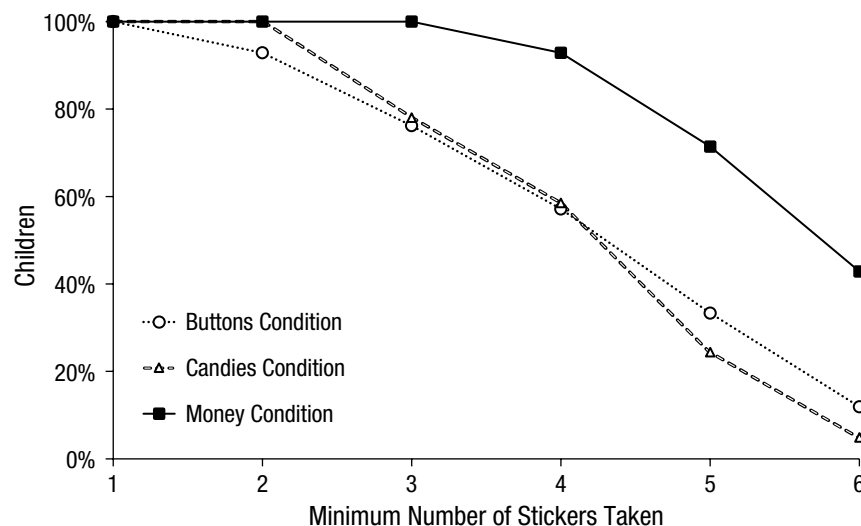
**Stickers taken.** We also tested whether the children who sorted money took more stickers than those who sorted neutral objects (buttons or candies). An ANOVA revealed a significant effect of condition,  $F(2, 122) = 17.87$ ,  $p < .001$ ,  $\eta^2 = .23$ . Planned contrasts showed that the children in the money condition took significantly more stickers ( $M = 5.07$ ,  $SD = 0.97$ , 95% CI = [4.70, 5.44]) than did both those in the buttons condition ( $M = 3.71$ ,  $SD = 1.47$ , 95% CI = [3.41, 4.09]),  $F(1, 122) = 25.85$ ,  $p < .001$ ,  $\eta^2 = .17$ , and those in the candies condition ( $M = 3.66$ ,  $SD = 1.17$ , 95% CI = [3.28, 4.04]),  $F(1, 122) = 27.67$ ,  $p < .001$ ,  $\eta^2 = .18$  (Fig. 7). The two neutral conditions (candies and buttons) did not differ significantly from each other,  $F(1, 122) = 0.04$ ,  $p = .836$ . These findings conceptually replicate the finding from the pilot study (see the Supplemental Material), in which handling money longer predicted taking more toys.

Additional analyses assessed extreme self-interest, operationalized as the percentage of children who took all the stickers offered. Extreme self-interest varied with condition,  $\chi^2(2, N = 125) = 21.29$ ,  $p < .001$ . The number

of children who took all six stickers was greater in the money condition ( $n = 18$ , 42.9%, 95% CI = [29.1%, 57.8%]) than in the buttons condition ( $n = 5$ , 11.9%, 95% CI = [5.2%, 25%]),  $\chi^2(1, N = 84) = 10.12$ ,  $p = .001$ ,  $\chi^2_{\text{Yates}}(1, N = 84) = 8.62$ ,  $p = .003$ , Fisher exact test:  $p = .003$ , and the candies condition ( $n = 2$ , 4.9%, 95% CI = [1.3%, 16.1%]),  $\chi^2(2, N = 83) = 16.36$ ,  $p < .001$ ,  $\chi^2_{\text{Yates}}(1, N = 83) = 14.35$ ,  $p < .001$ , Fisher exact test:  $p < .001$ . The two neutral conditions did not differ significantly from each other,  $\chi^2(1, N = 83) = 1.33$ ,  $p = .249$ ,  $\chi^2_{\text{Yates}}(1, N = 83) = 0.57$ ,  $p = .449$ , Fisher exact test:  $p = .433$ .

#### **Within-condition associations between time spent sorting and the key dependent variables.**

Our pilot study of American children ages 3 to 6 (see the Supplemental Material) showed that the longer the children handled money (which was self-determined, and thus not systematic), the more rewards they took and the fewer they donated. Given that the children in the Experiment 4 were allowed to sort the stimuli as long as they wished, we had an opportunity to test for a replication of those effects. Within each condition, we computed the correlations between (a) time spent on the sorting task and (b) the number of stickers taken and the percentage of stickers donated. We found significant correlations within the money condition: The duration of money sorting was associated with the number of stickers taken,  $r(42) = .417$ ,  $p = .006$ , as well as the percentage of stickers donated,  $r(42) = -.309$ ,  $p = .046$ . In contrast, the duration of button sorting was not reliably associated with the number of stickers taken,  $r(42) = -.054$ ,  $p = .733$ , or the



**Fig. 7.** Results from Experiment 4: number of stickers taken by the children in the money, buttons, and candies conditions ( $N = 125$ ). For each number of stickers, the graph shows the percentage of children who took at least that many stickers.

percentage of stickers donated,  $r(42) = .131$ ,  $p = .410$ . Similarly, the duration of candy sorting was not reliably associated with the number of stickers taken,  $r(42) = .021$ ,  $p = .897$ , or the percentage of stickers donated,  $r(42) = .241$ ,  $p = .130$ . The results for the money condition in this sample of Polish children ages 3 to 6 thus replicated the effects we saw in American children of the same age range.

**Liking of the sorting task.** Attesting to the desirability of candies as a stimulus, an ANOVA revealed a significant between-conditions difference in how much the children liked the sorting task,  $F(2, 122) = 4.15$ ,  $p = .018$ ,  $\eta^2 = .06$ . Sorting candies was rated as a more likeable task ( $M = 5.66$ ,  $SD = 1.11$ , 95% CI = [5.35, 5.97]) than sorting buttons ( $M = 5.10$ ,  $SD = 0.73$ , 95% CI = [4.79, 5.4]),  $F(1, 122) = 6.52$ ,  $p = .012$ ,  $\eta^2 = .05$ , or sorting money ( $M = 5.12$ ,  $SD = 1.13$ , 95% CI = [4.81, 5.43]),  $F(1, 122) = 5.98$ ,  $p = .016$ ,  $\eta^2 = .05$ . Sorting money and sorting buttons were seen as equally likeable,  $F(1, 122) = 0.01$ ,  $p = .914$ .

As expected, ratings of task liking did not correlate significantly with the number of stickers taken,  $r(125) = -.12$ ,  $p = .197$ , or with the percentage of stickers donated,  $r(125) = .08$ ,  $p = .398$ . These analyses support our hypothesis that the effect of the money prime is not due to liking for the sorting task.

**Mood.** The pattern of results for the children's mood mirrored the pattern for task liking. There was an effect of condition,  $F(2, 122) = 3.49$ ,  $p = .034$ ,  $\eta^2 = .05$ . The children indicated that they were in a better mood after sorting candies ( $M = 5.98$ ,  $SD = 0.88$ , 95% CI = [5.64, 6.31])

than after sorting money ( $M = 5.38$ ,  $SD = 1.40$ , 95% CI = [5.05, 5.71]),  $F(1, 122) = 6.42$ ,  $p = .013$ ,  $\eta^2 = .05$ , or buttons ( $M = 5.50$ ,  $SD = 0.83$ , 95% CI = [5.20, 5.85]),  $F(1, 122) = 3.71$ ,  $p = .056$ ,  $\eta^2 = .03$ . The money-primed children and the children primed with buttons did not differ significantly in their mood,  $F(1, 122) = 0.37$ ,  $p = .541$ ; this result mirrors results previously obtained with adults (e.g., Boucher & Kofos, 2012; Vohs et al., 2006; Zhou et al., 2009).

Mood was not significantly correlated with the number of stickers taken,  $r(125) = -.07$ ,  $p = .445$ , and was only marginally related to the percentage of stickers donated,  $r(125) = .17$ ,  $p = .065$ . The direction of the latter effect was opposite the direction predicted by the desirability hypothesis; that is, children who felt happier (presumably because they sorted a more desirable item) were somewhat more prosocial. Therefore, the enhanced self-interest and reduced communality in the children who were primed with money was not due to the money producing positive affect.

**Duration of the sorting task.** Time spent on the sorting task did not differ by condition,  $F(2, 122) = 1.3$ ,  $p = .276$ . Hence, the effects of condition seem not to be due to differences in time spent on the initial task.

## Discussion

In summary, Experiment 4 tested 3- to 6-year-olds who were exposed to money or other objects (buttons or candies). The children primed with money showed reduced communal behavior, as measured by two indicators of

generosity. These results replicate those of Experiments 3a and 3b, as well as previous findings with adults (e.g., Gasiorowska & Helka, 2012; Liu & Aaker, 2008; Vohs et al., 2006). Experiment 4 ruled out alternate explanations of the effect of the money prime, including the desirability account, by showing that its effects were not driven by how much the children liked sorting money or by their mood or task engagement.

Replicating the results of our pilot study of American preschoolers (see the Supplemental Material), Experiment 4 demonstrated that in the money condition, those children who took longer sorting the money, and hence were exposed to it longer, took more stickers for themselves and donated fewer stickers to other children. Time spent sorting buttons or candy did not predict either of these outcomes, which again attests to the specificity of the effect of money cues. Moreover, the finding that time spent handling money (but not buttons or candies) predicted the number of stickers taken reflects proportionality, which is a cognitive process uniquely tied to market mode (Fiske, 1991).

## General Discussion

Money is a vital component of cultural life. In five experiments testing 476 children, those who had handled money behaved in ways consistent with market mode and inconsistent with communal mode. The effects of handling money were not contingent on the money's value, the children's knowledge about money, or their age (see Supplemental Results in the Supplemental Material). The experiments ruled out alternate explanations based on mood, task engagement, and desirability of the stimuli.

The patterns we observed in Polish children (and in the American children in our pilot study) mirror patterns reported for samples of European, Asian, and North American adults (e.g., Boucher & Kofos, 2012; Chatterjee et al., 2013; Gasiorowska & Helka, 2012; Guéguen & Jacob, 2013; Liu & Aaker, 2008; Pfeffer & DeVoe, 2009; Roberts & Roberts, 2012; Vohs et al., 2006). The similarities across development and cultures suggest common and basic properties in the psychology of money.

We found no support for the idea that money knowledge might be the underlying mechanism by which money primes exert their effects. What might future work test? Differences in social acumen could be important. Mental modes serve social coordination (Fiske, 1992), and thus rely on people knowing what behaviors others will perform and expect. Theory of mind, which involves using assessments of others' inner states to predict their behavior (Wellman, Cross, & Watson, 2001), might be a candidate skill. This rationale is supported by Fiske's (1991) assertion that "a solipsist cannot engage in Market Pricing, for to act

in this mode is to orient oneself with reference to the action and potential action of others" (p. 396).

Why do market-mode cues hamper communal behaviors? Different mental modes have different costs and benefits. The costs entail the mental operations demanded, whereas the benefits include the degree to which social interactions are tightly coordinated. Communal and market modes are at two ends of a continuum. Communal mode demands little mental processing and does not afford a high degree of social organization. Market mode depends on many more cognitive operations and in return yields greater consistency in behavior (Fiske, 1991). One speculative idea for why people do not readily shift from market mode into communal mode is that the calculative cognitive operations elicited by market mode are difficult to relinquish once adopted.

## Concluding Remarks

Some of the credit for humanity's tremendous advances goes to the fact that humans, far more than other animals, engage in mutually beneficial interactions with strangers (Fukuyama, 2011). Perhaps more than any other invention, money facilitates those interactions. Market mode, seen around the globe, entails a style of thought, informal guidelines, and prescribed roles to be used when resources are being exchanged (Fiske, 1992). The five experiments reported here, to our knowledge, are the first to empirically demonstrate that children as young as age 3 connect money with market mode and demonstrate behaviors associated with it. These findings could aid an understanding of how and why the human mind is equipped for participating in markets.

## Author Contributions

A. Gasiorowska, T. Zaleskiewicz, and S. Wygrab developed the concept and design for Experiments 1, 2, 3a, and 3b. All authors developed the concept and design for Experiment 4. A. Gasiorowska, L. N. Chaplin, and S. Wygrab collected and analyzed the data, and all authors interpreted the data. A. Gasiorowska and K. D. Vohs drafted the manuscript; L. N. Chaplin and T. Zaleskiewicz provided critical revisions. All authors approved the final version of the manuscript for submission.

## Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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## Supplemental Material

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

## Open Practices



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## Notes

1. For the 4 children who worked until the end of the preset limit of 10 min, some of the judges (respectively, one, two, three, and three out of eight) evaluated their time of work as shorter than 600 s. When the judges' evaluations were averaged, the mean work duration for these participants was thus shorter than 10 min. For that reason, Figure 3 shows no children at the 10-min limit.
2. The descriptive statistics for all experiments and the pilot study are provided in Supplemental Results in the Supplemental Material. The regression analyses presented in Table S4 in Supplemental Results revealed that the effects of money priming were not moderated by children's gender and age.

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