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Dirty Money: The Role of Moral History in Economic Judgments

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Abstract

Although traditional economic models posit that money is fungible, psychological research abounds with examples that deviate from this assumption. Across eight experiments, we provide evidence that people construe physical currency as carrying traces of its moral history. In Experiments 1 and 2, people report being less likely to want money with negative moral history (i.e., stolen money). Experiments 3–5 provide evidence against an alternative account that people's judgments merely reflect beliefs about the consequences of accepting stolen money rather than moral sensitivity. Experiment 6 examines whether an aversion to stolen money may reflect contamination concerns, and Experiment 7 indicates that people report they would donate stolen money, thereby counteracting its negative history with a positive act. Finally, Experiment 8 demonstrates that, even in their recall of actual events, people report a reduced tendency to accept tainted money. Altogether, these findings suggest a robust tendency to evaluate money based on its moral history, even though it is designed to participate in exchanges that effectively erase its origins.

Keywords: Money; Morality; Social cognition; Disgust

1. Introduction

Economic models assume that money is fungible—any given piece (dollar, euro, yuan) is an abstract unit of exchange that represents a monetary amount, and its history and physicality are insignificant (Coulborn, 1950; Thaler, 1990). Thus, one dollar is the same as any other, in the sense that they are literally interchangeable. Whether the dollar is a coin or a bill, a birthday gift from your beloved grandmother or the ill-gotten gains from a drug dealer, newly minted or plucked from the sewers, its value and function remain

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constant. Nonetheless, an extensive body of research indicates that people's judgments deviate from the strict notion of fungibility assumed by classical economic models. For example, in a phenomenon known as "mental accounting," people separately budget for different expenses (e.g., gas, food) and separately track different sources of income (Hastings & Shapiro, 2013). Thus, gift money, found money, earned money, and illegally obtained money may be expended on different purchases (e.g., gift money is spent more on frivolous goods; Hoigard & Finstad, 1992; Kardos & Castano, 2012; Levav & McGraw, 2009; Stellar & Willer, 2014; Zelizer, 1994). These results indicate that the meaning of money is importantly linked to its source.

The current studies examine another key way that source influences how people reason about money by asking whether physical currency is treated as inheriting moral valence from its past. For non-monetary goods, the moral qualities of an owner influence how people think about objects and their value (Nemeroff & Rozin, 1994, 2000; Rozin, Nemeroff, Wane, & Sherrod, 1989). For example, people report that they would not wish to wear clothing once worn by a disliked person (Rozin, Millman, & Nemeroff, 1986). Adults also report being willing to pay premium prices for items that have come in contact with popular celebrities (Newman, Diesendruck, & Bloom, 2011), and even preschool children believe that items that were owned by a beloved celebrity are more valuable than items that were owned by an ordinary person (Gelman, Frazier, Noles, Manczak, & Stilwell, 2015). Beyond the laboratory as well, the degree to which an object is thought to have had physical contact with its owner influences how much people pay for it at celebrity auctions (Newman & Bloom, 2014).

An open question is whether monetary tokens are likewise thought to be contaminated by, and carry traces of, their moral history. Money is designed to participate in exchanges that effectively erase its origins, and thus discomfort with "dirty money" may not translate to concerns about the moral history of particular monetary tokens. Intriguingly, however, recent findings suggest that people do care about the physicality of monetary tokens, although none of this work has focused on the transmission of moral history per se. For example, people are more likely to spend worn bills than crisp bills, ridding themselves of money that is literally contaminated (Di Muro & Noseworthy, 2013; Galoni & Noseworthy, 2015). Furthermore, people judge that ownership attaches to the physical instantiation of money, such that lost or stolen bills should be returned to the owner in their original form rather than replaced with an equivalent amount (Uhlmann & Zhu, 2013). These findings—that physical monetary tokens are the site of literal contamination and ownership—demonstrate that money is construed not only in terms of its abstract economic potential but also in terms of its physical substance and material history. Yet concepts of literal contamination and ownership are themselves fundamentally tied to object origins and history (Friedman, Neary, Defeyter, & Malcolm, 2011; Gelman, Manczak, & Noles, 2012), and thus it is unclear whether the physicality of money extends beyond such concepts.

In virtually all societies, money can be considered as either "clean" or "dirty" based on how it was acquired (Douglas, 1967), with implications for how it is spent, or even whether it can be spent. Moreover, anthropological fieldwork suggests that at least in

some communities, moral history affects physical currency itself (Belk & Wallendorf, 1990; Shipton, 1989). For example, among the Luo of Kenya, bad money—or bitter money—obtains its status through theft and harm; such money is considered dangerous and can only become good through an elaborate purification ritual. These provocative findings suggest that money, like other physical objects, may be viewed as retaining traces of its moral history. However, this idea has yet to be studied experimentally or in other cultural contexts, especially a large-scale industrialized community in which money is highly standardized and typically exchanged among strangers.

1.1. The current studies

The present studies examined people's attitudes toward money that participated in morally negative events, either directly (it was stolen) or indirectly (it was offered by a thief). Specifically, we asked people how much they wanted to have money with varying histories, described in five different types of scenarios. Two served as baseline measures of how much people want money: *neutral-giver/neutral-money,* in which a character simply offered the participant money (designed to assess rates of desirability where there are no barriers, thus providing a high baseline), and *dirty-money*, in which a character sneezed on money and subsequently offered this money to the participant (designed to assess rates of desirability when there is literal contamination, thus providing a low baseline). The three remaining scenarios served as the key measures. Two involved stolen money that was offered to the participant, either by the person who stole it (*bad-giver/bad-money*) or by someone who found it (*neutral-giver/bad-money*). Finally, we included a scenario in which a thief offered participants non-stolen money (*bad-giver/neutral-money*).

These scenarios permitted us to differentiate between three different accounts of how moral history might influence people's economic judgments. (a) If people view moral history as contaminating the physical currency itself, they will be less likely to want the money in the *neutral-giver/bad-money* and *bad-giver/bad-money* conditions than in the *bad-giver/neutral-money* condition, where the physical currency itself was not involved in a morally questionable event. (b) In contrast, people may attach moral blame exclusively to the thief, with no consideration of the source of the physical currency per se. Under this account, people should want the money in the *bad-giver/neutral-money* and *bad-giver/bad-money* conditions at similar rates because, in both cases, the giver stole money. (c) A third possibility is that people may avoid any exchange for which they have a negative association or possible moral contamination, thus wanting the money equally in the *bad-giver/neutral-money*, *neutral-giver/bad-money*, and *bad-giver/bad-money* conditions.

Experiments 1 and 2 examine how much people would like to have money across all five scenarios, and find that participants report they would less like to have money with a negative moral history. Experiments 3–5 provide evidence against an alternative interpretation of this result, namely, that people are simply concerned that they might get into trouble for wanting stolen money. Experiment 6 examines whether people's aversion to stolen money may reflect concerns about moral contamination. Experiment 7 finds that

people report they would be less likely to spend money with negative moral history on themselves, and more likely to donate such money to charity, consistent with the notion that they wish to counteract its negative history with a positive moral act. Finally, Experiment 8 shows that, in their recall of actual events, people report that when offered money that they considered morally compromised, they often rejected it. Altogether, these studies suggest a robust tendency to evaluate money based on its moral history, even though it is designed to participate in exchanges that effectively erase its origins.

2. Experiment 1

2.1. Method

2.1.1. Participants

One hundred adults (34 females; M_{age} = 32 years; range = 18–69 years) completed the study online via Amazon's Mechanical Turk (MTurk). Participants in all studies were located in the United States.

2.1.2. Materials and procedure

Each participant was presented with five scenarios presented in random order in which a dollar was described, and they were asked how much they wanted the dollar, using a 7-point scale anchored by "not at all" (1) to "very much" (7). The five scenarios were as follows: (a) *neutral-giver/neutral-money* (e.g., "Henry has a dollar in his desk. Henry says you can have the dollar, if you want."); (b) *bad-giver/neutral-money* (e.g., "Paul stole a dollar from another person. The dollar that he stole is in his pocket. Paul has another dollar that he did not steal, in his desk. Paul says you can have the dollar in his desk, if you want."); (c) *neutral-giver/bad-money* (e.g., "Frank found a stolen dollar in his desk. Frank says you can have the dollar, if you want."); (d) *bad-giver/bad-money* (e.g., "Brian stole a dollar from another person. Brian says you can have the dollar, if you want."); (e) *dirty-money* (e.g., "Marvin sneezed and used a dollar to wipe his nose. Marvin says you can have the dollar, if you want.").

2.2. Results and discussion

A repeated-measures ANOVA on adults' ratings with scenario as a within-subject factor yielded a main effect of scenario, $F(4, 396) = 80.09$, $p < .001$, $\eta_p^2 = .45$; see Fig. 1. A series of planned comparisons examined three issues: (a) how moral history compared to moral association; (b) the role of moral history when controlling for the giver's moral status; and (c) how the key conditions involving a moral misdeed compared to the two baseline conditions.

To examine whether moral history matters more than moral association, we compared responses in the *neutral-giver/bad-money* condition to the *bad-giver/neutral-money* condition. People reported that they were less likely to want a dollar with a negative moral

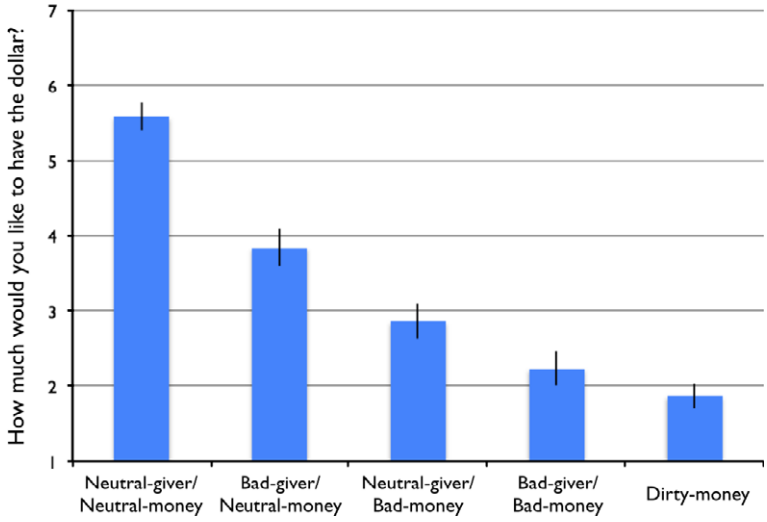

Fig. 1. Experiment 1, participants' mean ratings of how much they would want a dollar, on a scale of 1 ("not at all") to 7 ("very much"), across five scenarios. Error bars represent *SE*.

history than a negative moral association, $t(99) = 4.50$, $p < .001$, $d = .45$, thus indicating that moral history trumps moral association. As a test of whether moral history of the particular dollar influences people's judgments, we compared responses in the *bad-giver/bad-money* condition to the *bad-giver/neutral-money* condition and found that people were less likely to want the dollar involved in the theft than another dollar possessed by the thief of a dollar, $t(99) = 6.95$, $p < .001$, $d = .70$. This result indicates that moral history specifically and selectively contaminates the physical currency that had participated in the morally negative event.

The analyses next focused on how the key conditions above compared to the baselines. As predicted, people were more likely to want the money in the *neutral-giver/neutral-money* condition than they were in the *dirty-money* condition, $t(99) = 17.51$, $p < .001$, $d = 1.75$, demonstrating that the task was sensitive to the baseline comparisons of neutral versus literal contamination. They were also more likely to want the money in the *neutral-giver/neutral-money* condition than in the three conditions involving a moral misdeed, $ps < .001$, and they were also less likely to want the money in the *dirty-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 6.93$, $p < .001$, $d = .69$, and the *neutral-giver/bad-money* condition, $t(99) = 3.75$, $p < .001$, $d = .38$. There was no difference between the *dirty-money* and *bad-giver/bad-money* conditions, $t(99) = 1.54$, $p = .13$, $d = .15$.

Taken together, these findings indicate that people show an aversion to money with tainted moral history by placing more weight on moral history than moral association, and additional weight on the physical bill that had participated in the stealing event. These results support the interpretation that moral history is thought to cling to monetary tokens.

3. Experiment 2

Experiment 1 provides evidence that people attach moral significance to physical currency and are less likely to report wanting money with a moral taint. However, it is possible that people may only show this aversion for small amounts of money, on which they place little value. A stronger test of the power of moral history would be to replicate Experiment 1 with higher-value bills. Experiment 2 did so, using hundred-dollar bills instead of dollar bills. We predicted that even when the monetary benefit was substantially higher, participants would continue to report lower rates of wanting the stolen money.

3.1. Method

3.1.1. Participants

One hundred adults (45 females; M_{age} = 37 years; range = 19–68 years) completed the study online via MTurk.

3.1.2. Materials and procedure

The procedure was the same as in Experiment 1, except that the scenarios involved a one hundred-dollar bill instead of a dollar bill.

3.2. Results and discussion

A repeated-measures ANOVA on ratings with scenario as a within-subject factor yielded a main effect of scenario, $F(4, 396) = 83.67$, $p < .001$, $\eta_p^2 = .46$; see Fig. 2. As in Experiment 1, moral history trumps moral association—people were less likely to want the money in the *neutral-giver/bad-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 7.05$, $p < .001$, $d = .71$. Moreover, people were less likely to want the money in the *bad-giver/bad-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 8.93$, $p < .001$, $d = .89$. Participants were also more likely to want the money in the *neutral-giver/neutral-money* compared to the other conditions, ps < .001, but unlike in Experiment 1, they were more likely to want the money in the *dirty-money* condition than in the three conditions involving a moral misdeed, ps < .01.

These findings provide evidence that an aversion toward tainted money is not restricted to cases when the amount on offer is small (one dollar). Instead, it seems that people also imbue larger amounts of money (one hundred dollars) with moral history. If anything, these results suggest that the moral taint of money is substantially more powerful than the non-moral taint of literally dirty money: Whereas the monetary amount influenced people's attitudes toward money that was dirty, it did not influence people's attitudes toward money that was tainted. Why such differences were obtained is open to at least two interpretations. One possibility is that the degree of moral taint increases as the amount stolen increases (i.e., it is more of a moral violation to steal $100 than $1),

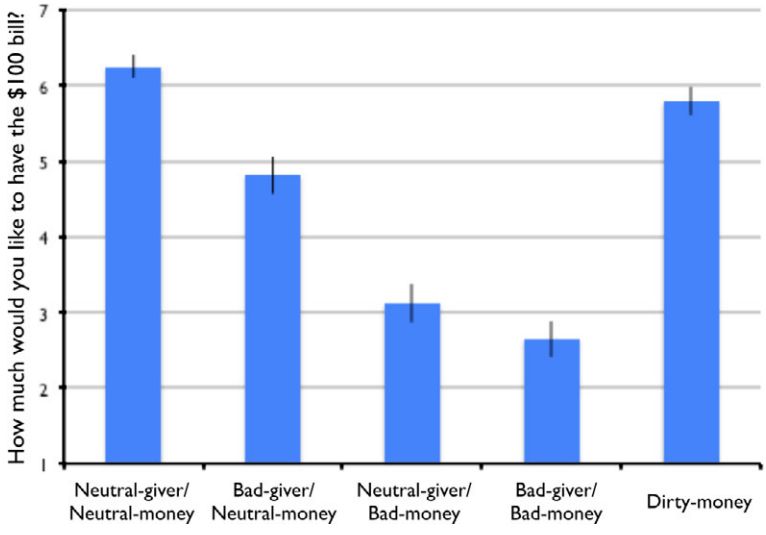

Fig. 2. Experiment 2, participants' mean ratings of how much they would want a $100 bill, on a scale of 1 ("not at all") to 7 ("very much"), across five scenarios. Error bars represent *SE*.

suggesting that the increased benefit to the participant is offset by the increased moral taint. In contrast, the degree of literal dirt does not differ for a sneezed-upon $100 bill versus a sneezed-upon $1 bill. Another possibility is that literal contamination is viewed as more reversible than moral contamination, so that people reason they could clean a literally dirty hundred-dollar bill but not a stolen hundred-dollar bill. Support for the latter interpretation is that some participants did mention ways of cleaning the dirty $100 bill (e.g., "I can spray it with Lysol and wash my hands!"). Although a literally dirty one-dollar bill could also be cleaned, participants may be less motivated to engage in that effort, given the lower amount. In any case, regardless of why these differences across studies were obtained, the present findings taken as a whole indicate that people imbue money with moral history even when the amount on offer is large.

4. Experiment 3

Experiments 1 and 2 suggest that people attach moral significance to physical currency and are less likely to want tainted money because of this. However, a possible alternative interpretation of this result is that people believe that they could get in trouble by accepting a stolen bill. For example, paper bills are potentially traceable, as each carries a unique serial number, and thus someone in possession of a stolen bill could theoretically be caught and punished on that basis. To address this alternative, Experiment 3 tested people's economic judgments about quarters, which do not carry serial numbers like paper bills. If people in Experiments 1 and 2 rejected the stolen money strictly out of concern about getting into trouble, then such concern should be reduced when the money

is in the form of non-traceable coins. In contrast, if people continue to show an aversion toward quarters with a morally negative past, then this is further evidence for their concern about the moral history of the money.

4.1. Method

4.1.1. Participants

One hundred adults (41 females; M_{age} = 36 years; range = 18–68 years) completed the study online via MTurk. An additional 100 adults (36 females; M_{age} = 36 years; range = 19–67 years) participated in a pretest, also via MTurk.

4.1.2. Materials and procedure

The procedure was the same as in the previous experiments, except that the scenarios involved four quarters. Because the logic of the study rests on the assumption that people believe quarters to be less traceable than dollars, we also conducted a pretest with a separate group of participants, assessing their beliefs about the traceability of dollar bills and quarters. Specifically, participants randomly received one of two questions about dollars or quarters: "Please answer this question with regard to U.S. dollar bills (quarter coins) that are currently in circulation. Do you think that a dollar bill (quarter) carries a unique serial number that could be traced?" Participants indicated their response by choosing "yes" or "no." A Fisher's exact test revealed that participants judged that dollars are traceable (76%) more than quarters (16%), $p < .001$, and each judgment differed from chance, ps $< .001$ by a binomial test.

4.2. Results and discussion

A repeated-measures ANOVA on ratings with scenario as a within-subject factor yielded a main effect of scenario, $F(4, 396) = 54.08$, $p < .001$, $\eta_p^2 = .35$; see Fig. 3. As in the previous experiments, moral history trumps moral association—people were less likely to want the money in the *neutral-giver/bad-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 5.62$, $p < .001$, $d = .56$. Moreover, people were less likely to want the quarters involved in the theft (*bad-giver/bad-money*) than the quarters possessed by the thief of four other quarters (*bad-giver/neutral-money*), $t(99) = 7.35$, $p < .001$, $d = .74$. Participants were also more likely to want the money in the *neutral-giver/neutral-money* condition compared to the other conditions, ps $< .001$, and they were less likely to want the money in the *dirty-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 4.41$, $p < .001$, $d = .44$. The *dirty-money* condition did not differ from either the *neutral-giver/bad-dollar* condition, $t(99) = .25$, $p = .80$, $d = .03$, or the *bad-giver/bad-money* condition, $t(99) = 1.34$, $p = .18$, $d = .13$, perhaps because the *dirty-money* condition was less extreme, as it did not involve the character wiping his nose on the money.

Taken together, these findings show that people continue to show an aversion toward morally tainted money even when the likelihood of getting into trouble is reduced. If

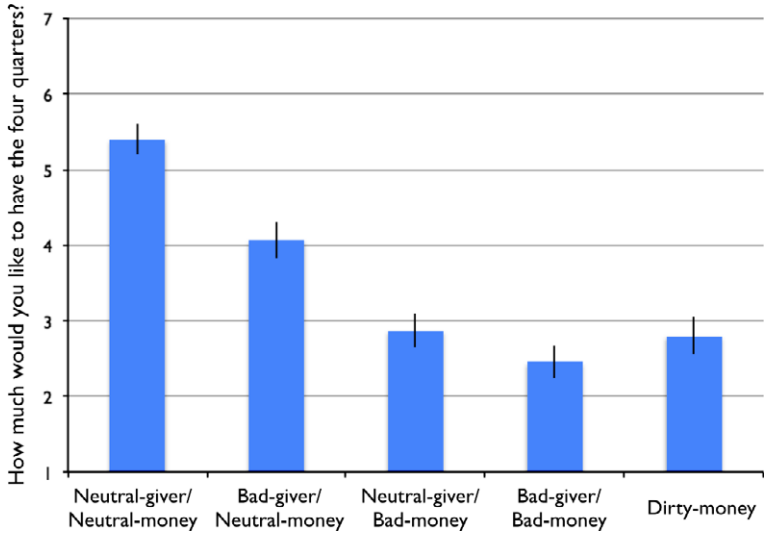

Fig. 3. Experiment 3, participants' mean ratings of how much they would want four quarters, on a scale of 1 ("not at all") to 7 ("very much"), across five scenarios. Error bars represent *SE*.

people were simply concerned about getting caught for being in possession of stolen money, then such concerns should be lessened in this context because quarters are not uniquely traceable in the same way that dollars are. However, people showed the same pattern of results with quarters as they did with dollar bills.

5. Experiment 4

Although the prior experiment indicated that people do not want quarters with a negative moral history—even though quarters (unlike dollar bills) are not traceable—people may still fear the consequences of accepting stolen money (e.g., if someone saw the money being stolen). Experiment 4 provides a stronger test by stipulating that no one would ever know that the money was stolen. We reasoned that if only the thief was aware of the crime, the possibility of getting into trouble would be greatly reduced. If participants nonetheless continue to show an aversion to the stolen money, this would provide additional support for the interpretation that people believe that moral history clings to physical currency, thereby contaminating it.

5.1. Method

5.1.1. Participants

One hundred adults (35 females; M_{age} = 35 years; range = 20–75 years) completed the study online via MTurk.

5.1.2. Materials and procedure

The procedure was similar to Experiment 3, except that the three scenarios that involved stealing explicitly stipulated that only the thief saw the money being stolen, and no one other than the thief would ever be aware of the loss. Specifically, the theft scenarios changed as follows: (a) *bad-giver/neutral-money* (e.g., "Paul stole four quarters from a large jar of quarters. No one saw Paul steal the quarters, and only Paul will ever know that the quarters are missing. The stolen quarters are in his pocket. Paul has another four quarters that he did not steal, in his desk. Paul says you can have the four quarters in his desk, if you want."); (b) *neutral-giver/bad-money* (e.g., "Frank found four stolen quarters in his desk. Someone named Greg had stolen the quarters from a large jar of quarters. No one saw Greg steal the quarters, and only Greg will ever know that the quarters are missing. Frank says you can have the four quarters, if you want."); (c) *bad-giver/bad-money* (e.g., "Brian stole four quarters from a large jar of quarters. No one saw Brian steal the quarters, and only Brian will ever know that the quarters are missing. The stolen quarters are in his desk. Brian says you can have the four quarters, if you want.").

5.2. Results and discussion

A repeated-measures ANOVA on ratings with scenario as a within-subject factor yielded a main effect of scenario, $F(4, 396) = 42.78$, $p < .001$, $\eta_p^2 = .30$; see Fig. 4. As in the previous experiments, moral history trumps moral association—people were less likely to want the money in the *neutral-giver/bad-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 3.29$, $p = .001$, $d = .33$. People were also less likely to want the quarters involved in the theft (*bad-giver/bad-money*) than the quarters possessed by

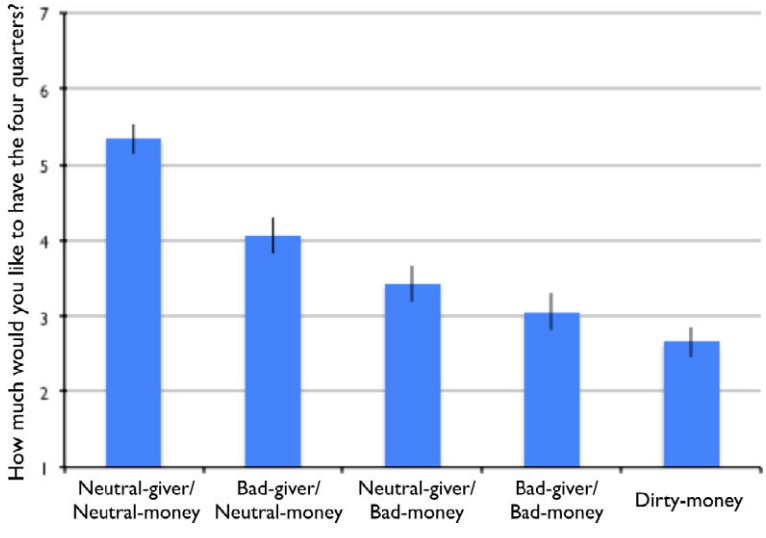

Fig. 4. Experiment 4, participants' mean ratings of how much they would want four quarters, on a scale of 1 ("not at all") to 7 ("very much"), across five scenarios. Error bars represent *SE*.

the thief of four other quarters (*bad-giver/neutral-money*), $t(99) = 5.75$, $p < .001$, $d = .58$. Participants were also more likely to want the money in the *neutral-giver/neutral-money* condition compared to the other conditions, ps $< .001$, and they were less likely to want the money in the *dirty-money* condition than in either the *bad-giver/neutral-money* condition, $t(99) = 5.12$, $p < .001$, $d = .51$, or the *neutral-giver/bad-money* condition, $t(99) = 2.88$, $p = .005$, $d = .29$. The *dirty-money* condition did not differ from the *bad-giver/bad-money* condition, $t(99) = 1.46$, $p = .15$, $d = .15$. Altogether, these findings provide further evidence against the possibility that people reject stolen money solely because they fear punishment. People report not wanting stolen money, even when they are told that no one saw it being stolen and the owner was not even aware of the theft. These results provide additional support for the idea that people consider money with a morally negative past as tainted.

6. Experiment 5

Although the previous study provided vignettes stipulating that no one would ever know that the relevant money was stolen, participants may have made additional assumptions about the scenarios that could allow for someone getting into trouble if they were to accept the stolen coins. For example, participants could speculate that the person who stole the coins would know that the recipient was in possession of stolen money. To bypass this possibility, Experiment 5 asked participants how much they would want the money if there was no way they could get into trouble for accepting it. In this way, we can test most directly the hypothesis that participants are averse to accepting stolen money, not as a result of direct negative consequences of doing so, but rather because the money is imbued with its moral history.

6.1. Method

6.1.1. Participants

One hundred adults (40 females; $M_{age} = 38$ years; range = 20–72 years) completed the study online via MTurk.

6.1.2. Materials and procedure

The procedure was the same as in Experiment 1; however, here, participants were asked the following question at the end of each scenario: "How much would you like to have the dollar, if there was no way you could get into trouble for accepting it?"

6.2. Results and discussion

A repeated-measures ANOVA on ratings with scenario as a within-subject factor yielded a main effect of scenario, $F(4, 396) = 57.27$, $p < .001$, $\eta_p^2 = .37$; see Fig. 5. As in the previous experiments, moral history mattered more than moral association—people were

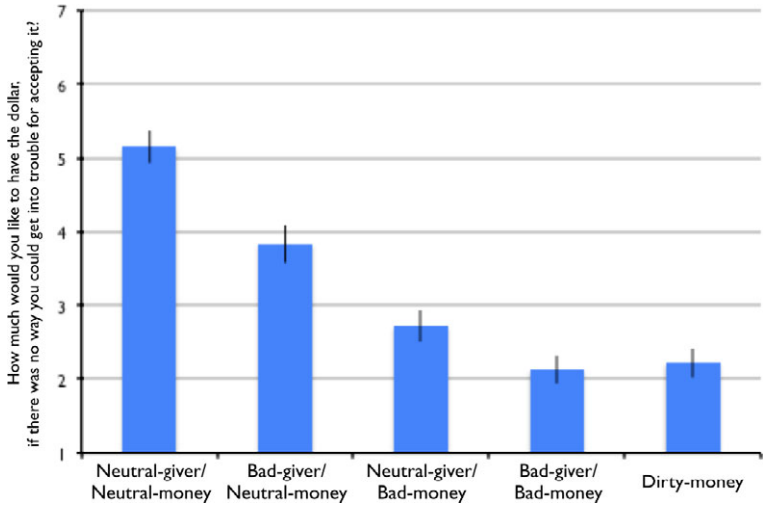

Fig. 5. Experiment 5, participants' mean ratings of how much they would want a dollar if they could not get into trouble for accepting it, on a scale of 1 ("not at all") to 7 ("very much"), across five scenarios. Error bars represent *SE*.

less likely to want the money in the *neutral-giver/bad-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 4.39$, $p < .001$, $d = .44$. People were also less likely to want the dollar involved in the theft (*bad-giver/bad-money*) than the dollar possessed by the thief of another dollar (*bad-giver/neutral-money*), $t(99) = 6.83$, $p < .001$, $d = .68$. Participants were also more likely to want the money in the *neutral-giver/neutral-money* condition compared to the other conditions, $ps < .001$, and they were less likely to want the money in the *dirty-money* condition than in the *bad-giver/neutral-money* condition, $t(99) = 6.03$, $p < .001$, $d = .60$. The *dirty-money* condition did not differ from either the *neutral-giver/bad-dollar* condition, $t(99) = 1.92$, $p = .057$, $d = .19$, or the *bad-giver/bad-money* condition, $t(99) = .38$, $p = .70$, $d = .04$. In sum, these findings provide evidence against the possibility that people are less likely to want money with a morally negative past because they fear punishment. Instead, they support the claim that moral history clings to physical currency, thus making money less desirable.

7. Experiment 6

The experiments reported thus far demonstrate that people tend to reject money that participated in a morally negative event, whether or not the money is traceable, whether or not the crime is known, and whether or not they could get into trouble for accepting the money. We have interpreted this finding as indicating that people view tokens of money as carrying traces of their moral history, such that physical currency is contaminated by its negative past and thus should be avoided. Experiment 6 tests the prediction that people's desire for stolen money would be negatively associated with their

contamination sensitivity. This prediction follows from prior research documenting that contamination sensitivity predicts severity of moral condemnation (Chapman & Anderson, 2014; Jones & Fitness, 2008; but see Landy & Goodwin, 2015), in other words, that literal disgust is conceptually linked to moral disgust.

7.1. Method

7.1.1. Participants

One hundred fifty adults (51 females; M_{age} = 35 years; range = 18–67 years) completed the study online via MTurk.

7.1.2. Materials and procedure

The procedure was the same as in Experiment 1, with one exception: After responding to the five scenarios, participants received items from the Disgust Scale-Revised (Haidt, McCauley, & Rozin, 1994), specifically, a subset measuring contamination-based disgust (Olatunji et al., 2007). Scores can range from 0 to 20, with higher scores corresponding to higher levels of contamination-based disgust. We also included the two manipulation check items featured in the Disgust Scale-Revised, which 139 participants passed; data from 11 participants were excluded from the analyses for failing this check.

7.2. Results and discussion

A repeated-measures ANOVA on ratings with scenario as a within-subject factor yielded a main effect of scenario, $F(4, 552) = 112.11$, $p < .001$, $\eta_p^2 = .45$; see Fig. 6. As in the

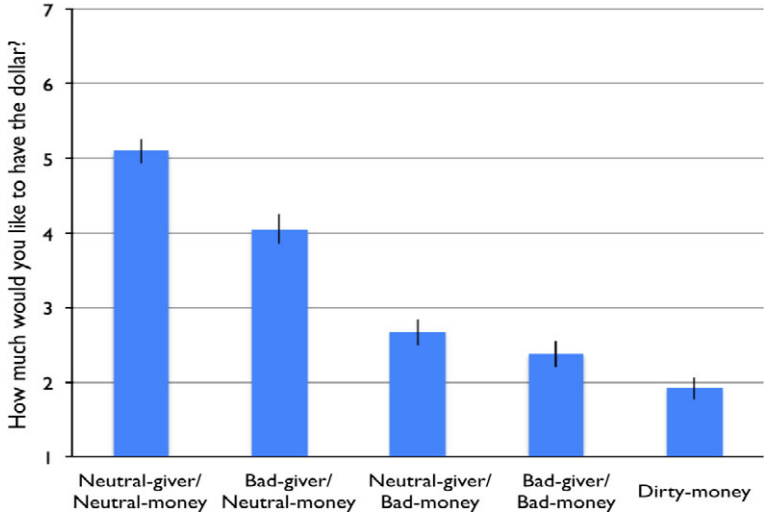

Fig. 6. Experiment 6, participants' mean ratings of how much they would want a dollar, on a scale of 1 ("not at all") to 7 ("very much"), across five scenarios. Error bars represent *SE*.

prior experiments, people were less likely to want money with a negative moral history (*neutral-giver/bad-money*) than money with a negative moral association (*bad-giver/neutral-money*), $t(138) = 8.39$, $p < .001$, $d = .71$. They were also less likely to want a dollar stolen by a thief (*bad-giver/bad-money*) than a non-stolen dollar possessed by a thief (*bad-giver/neutral-money*), $t(138) = 9.41$, $p < .001$, $d = .80$. Participants were also more likely to want the money in the *neutral-giver/neutral-money* condition compared to the other conditions, ps $< .001$, and they were less likely to want the money in the *dirty-money* condition than in the three conditions involving a moral misdeed, ps $< .02$.

Next, we examined the correlations between contamination sensitivity and judgments in the money task. As predicted, there was a relation between contamination sensitivity and participants' judgments in the *dirty-dollar* condition, $r = -.25$, $p = .004$, indicating that the more sensitive to contamination participants reported as being, the less likely they were to want money that was literally dirty. Moreover, as predicted, there was no relation between the two variables in the condition involving neither literal nor moral contamination (*neutral-giver/neutral-money*), $r = .04$, $p = .62$. Counter to our predictions, however, there was no relation between participants' contamination sensitivity scores and their responses on the three scenarios involving a moral misdeed: *bad-giver/neutral-dollar*, $r = -.05$, $p = .53$, *neutral-giver/bad-dollar*, $r = -.11$, $p = .19$, and *bad-giver-bad-dollar*, $r = -.08$, $p = .33$.

Taken together, these findings do not support the idea that people's desire for stolen money is associated with their disgust sensitivity. Future research could explore the moderating role of disgust on the effects reported here, but it is important to note that recent work suggests that disgust sensitivity may play little to no role on moral judgments (Landy & Goodwin, 2015).

8. Experiment 7

If money is evaluated based on its moral history, then an important question to consider is how people choose to spend money that may or may not be tainted. Thus, in Experiment 7, we asked participants how they would spend the dollar in each scenario: on something they need (e.g., rent), on a special treat (e.g., restaurant), on a donation to charity, or on a gift for someone else. We predicted that participants would be less willing to spend the money on themselves—either on a necessity or a special treat—when it was stolen, reflecting discomfort with accepting the stolen dollar. We also predicted that people would be more willing to donate the money when it was stolen, as this provides a mechanism for counteracting its negative moral status with a good deed. Indeed, previous work suggests that moral taint can be neutralized by contact with a virtuous source (e.g., a sweater once worn by Hitler becomes less evil if handled by Mother Theresa; Nemeroff & Rozin, 1994), and sociological research suggests that money obtained from child wrongful death suits—or "blood money"—is often donated to virtuous causes, such as charities and safety organizations (Zelizer, 1994). Finally, we did not have clear predictions regarding how people would judge the possibility of spending the money on a gift

for someone else. On the one hand, giving a gift is a nice thing to do and so again may be seen as a mechanism for counteracting the negative moral status of stolen money. On the other hand, giving a gift confers "credit" to the giver (in the form of social capital), and people may feel that such benefit is unearned when the gift was purchased with stolen money.

8.1. Method

8.1.1. Participants

One hundred adults (48 females; M_{age} = 38 years; range = 19–68 years) completed the study online via MTurk.

8.1.2. Materials and procedure

Each participant was presented with the five scenarios used in Experiment 1, in random order, and was asked to imagine how likely they are to spend the dollar in each of the following ways: (a) "I would spend it on something I need (e.g., groceries, rent, utility bill)"; (b) "I would spend it on a special treat for myself (e.g., music, movie, restaurant)"; (c) "I would spent it on a donation to charity"; (d) "I would spend it on a gift for someone else." The four options were randomly presented on each trial, and participants were asked how likely they were to spend the dollar in each way on a 7-point scale anchored by "not at all" (1) to "very likely" (7).

8.2. Results and discussion

A repeated-measures ANOVA with scenario and spending option as within-subject factors yielded a main effect of scenario, $F(4, 396) = 17.85$, $p < .001$, $\eta_p^2 = .15$, a main effect of spending option, $F(3, 297) = 37.11$, $p < .001$, $\eta_p^2 = .27$, and a scenario x spending option interaction, $F(12, 1188) = 11.54$, $p < .001$, $\eta_p^2 = .10$; see Table 1. Given the interaction, results are reported separately by spending option.

Responses differed across scenarios for the necessity, $F(4, 396) = 25.17$, $p < .001$, $\eta_p^2 = .20$, and luxury spending options, $F(4, 396) = 18.63$, $p < .001$, $\eta_p^2 = .16$. As predicted, people were more likely to spend the money on something they need (e.g.,

Table 1
Experiment 7, participants' mean ratings of how much they would spend a dollar on a necessity, luxury, charity, or gift, on a scale of 1 ("not at all") to 7 ("very much"), across five scenarios

Scenario	Necessity	Luxury	Charity	Gift
Neutral-giver/neutral-dollar	5.84 (1.33)	4.30 (1.88)	2.92 (1.93)	3.27 (1.82)
Bad-giver/neutral-dollar	5.04 (2.06)	3.64 (2.05)	2.93 (2.01)	2.73 (1.78)
Neutral-giver/bad-dollar	4.46 (2.14)	3.15 (1.89)	3.48 (2.18)	2.84 (1.72)
Bad-giver/bad-dollar	4.14 (2.40)	2.91 (2.05)	3.41 (2.38)	2.55 (1.80)
Dirty-dollar	4.17 (2.42)	2.91 (2.03)	2.51 (1.94)	2.56 (1.83)

*Note. SD*s are in parentheses.

groceries, rent, utility bill) in the *neutral-giver/neutral-dollar* condition than in the other conditions, *p*s < .001. Importantly, people were also more likely to want to spend the money on a necessity in the *bad-giver/neutral-dollar* condition than in either the *neutral-giver/bad-dollar* condition, $t(99) = 3.60$, $p < .001$, $d = .36$, or in the *bad-giver/bad-dollar* condition, $t(99) = 4.73$, $p < .001$, $d = .47$. There was also a difference between the latter two conditions, $t(99) = 2.25$, $p = .026$, $d = .23$. Also as predicted, participants were more likely to want to spend the money on a special treat for themselves (e.g., music, movie, restaurant) in the *neutral-giver/neutral-dollar* condition than in the other conditions, *p*s < .001. Importantly, people were also more likely to want to spend the money on a luxury in the *bad-giver/neutral-dollar* condition than in either the *neutral-giver/bad-dollar* condition, $t(99) = 2.96$, $p = .004$, $d = .30$, or in the *bad-giver/bad-dollar* condition, $t(99) = 3.66$, $p < .001$, $d = .37$. The latter two conditions did not differ, $t(99) = 1.79$, $p = .08$, $d = .18$. These findings are consistent with the view that people are less willing to spend money with negative moral history on themselves.

There was also a difference across scenarios for the charity spending option, $F(4, 396) = 7.07$, $p < .001$, $\eta_p^2 = .07$. Although people were not more willing to spend the money on charity in the *bad-giver/neutral-dollar* condition than in the *neutral-giver/neutral-dollar* condition, $t(99) = .06$, $p = .96$, they were more willing to do so in the two scenarios involving tainted money (*neutral-giver/bad-money* and *bad-giver/bad-money*) compared to the *neutral-giver/neutral-dollar* condition, *p*s < .04. Critically, people were less likely to want to donate the dollar in the *bad-giver/neutral-dollar* condition than in either the *neutral-giver/bad-dollar* condition, $t(99) = 2.74$, $p = .007$, $d = .27$, or in the *bad-giver/bad-dollar* condition, $t(99) = 2.00$, $p = .048$, $d = .20$. The latter two conditions did not differ, $t(99) = .43$, $p = .67$. These results provide converging evidence that moral history is believed to contaminate money, such that people prefer to counteract the negative history of physical currency with a positive act.

Finally, responses also differed across scenarios for the gift spending option, $F(4, 396) = 5.58$, $p < .001$, $\eta_p^2 = .05$. People were more likely to spend the money on a gift for someone else in the *neutral-giver/neutral-dollar* condition than in the other conditions, *p*s < .02. However, the *bad-giver/neutral-dollar* condition did not differ from either the *neutral-giver/bad-dollar* condition, $t(99) = .71$, $p = .48$, $d = .07$, or the *bad-giver/bad-dollar* condition, $t(99) = 1.20$, $p = .23$, $d = .12$. There was a difference between the latter two conditions, $t(99) = 2.28$, $p = .025$, $d = .23$. These results suggest that different considerations may come into play when contemplating gift-giving, especially since the provenance of a gift has strong meaning, as can be seen with prohibitions against re-gifting (Ertimur, Muñoz, & Hutton, 2015). When selecting a gift for someone else, the gift-giver may avoid any purchase that could have a negative connotation. Further research would be needed to test this idea.

Taken together, these findings indicate that people are less likely to spend morally tainted money on themselves, yet they prefer to donate such money to charity. This finding cannot be due to participants simply wanting to balance any bad deed with a good one, as participants were *less* likely to donate the money in the *bad-giver/neutral-money* condition than in the *neutral-giver/bad-money* condition.

9. Experiment 8

An important open question is whether the tendency to imbue money with moral history reflects people's actual behaviors in the real world. Given the significant logistical challenges in testing this experimentally (e.g., convincing participants that a stranger who is offering a stolen dollar does not have ulterior motives), we decided to test this in Experiment 8 by asking people to recall prior relevant instances from their own experiences. Specifically, participants were asked to recall instances in which they were offered money that was "dirty," either literally (e.g., sweaty or smelly) or metaphorically (e.g., stolen, or obtained from a drug deal), and whether they accepted such money or not. We predicted that participants would be less likely to have accepted metaphorically dirty money in the past than physically dirty money, given the previous results indicating that the moral taint of money is more powerful than the non-moral taint of literally dirty money.

9.1. Method

9.1.1. Participants

Three hundred adults (122 females; M_{age} = 33 years; range = 19–73 years) completed the study online via MTurk. The sample size was selected based on piloting in which approximately 15% of the sample reported being offered money with negative moral history. We selected 300 in order to have a sufficiently large sample for analyses.

9.1.2. Materials and procedure

Each participant was asked to respond to the following question: "Did someone ever offer you money (coins or bills) that you felt was tainted or dirty, either literally or metaphorically? If so, how was it tainted or dirty? Please provide as much detail as possible." After responding to this question, participants were asked to indicate whether they accepted this money or not. Three independent coders blind to the study's predictions coded each response as belonging to one of the following four categories: *physically dirty* (e.g., "I have been offered money out of a woman's sweaty bra, I felt that it was literally dirty. The money was wet."), *metaphorically dirty* (e.g., "Many years ago my mother-in-law kept taking money from a dying old man with no family and tried to give some to us."), *fake* (e.g., "Someone gave me a $5.00 bill but I noticed it was shorter than the other bills in my wallet."), or *none* (e.g., "Nobody has ever offered me money that I felt was tainted or dirty, either literally or metaphorically."). The three coders agreed on 92.67% of trials; disagreements were resolved by a majority vote. The distribution of responses was as follows: *physically dirty* (n = 118, 39%), *metaphorically dirty* (n = 60, 20%), *fake* (n = 5, 2%), and none (n = 117, 39%).

9.2. Results and discussion

As predicted, participants accepted physically dirty and metaphorically dirty money at different rates, Fisher's exact test, $p < .001$. Although participants overwhelmingly

accepted physically dirty money (103 of 118 participants, 87%), they accepted metaphorically dirty money only about half the time (35 of 60 participants, 58%). These findings are consistent with the idea that people show an aversion toward money with a morally negative past, and that moral taint is viewed as more aversive than physical taint. At the same time, it is important to note that metaphorically dirty money in this study included not only stolen money, as in the previous studies, but also a broader array of contamination (e.g., money obtained from selling drugs or other illegal activities; money offered as an emotional bribe; payment offered for volunteer work). Perhaps not surprisingly, in participants' retrospective reports, metaphorically dirty money was often offered by a person who was morally comprised, so it is not always clear whether participants' responses resulted from an aversion to negative moral history, negative moral association, or both. Nevertheless, it is notable that participants in this study rejected such money at similar rates to participants in the previous studies, suggesting that even in recalling events from their actual lives, people view money involved in questionable activities as morally tainted and less desirable.

10. General discussion

Across eight studies, we have found that people treat money as carrying traces of its moral history, whether the amount was big or small, likely to get them into trouble or not, or offered to them actually or hypothetically. What could explain people's attitudes toward morally tainted money? On a purely *associative* account, negativity would have affixed equally to all three conditions involving either a morally compromised giver or stolen money, as all have a negative association, and thus people would have reported not wanting the money equally in all three conditions. On a purely *economic* account, blame would have been assigned to the thief without consideration of which particular piece of currency was stolen, and thus people would have been less likely to want any piece offered by the thief (*bad-giver/neutral-money* and *bad-giver/bad-money),* but not the stolen money offered by a morally neutral individual (*neutral-giver/bad-money*). Finally, on a *physical moral taint* account, contamination would have affixed to both the thief and the stolen money, but particularly to the stolen money, because it participated most directly in the morally negative event. Under this account, people would be less likely to want stolen money from a morally neutral individual than non-stolen money from a morally compromised individual. Our findings support the physical moral taint account: People reported wanting the physical money that had participated in the stealing event the least.

Given that moral history was viewed as contaminating, one question that arises is why one form of moral contamination was considered worse than another. In other words, why did participants treat money that itself was stolen as more noxious than non-stolen money that a thief had handled, given that in both cases, the money had a morally negative history? Certainly, prior work demonstrates that even neutral items are viewed as contaminated after contact with a bad person (Rozin et al., 1986). We suggest that the

more closely the money is implicated in the moral misdeed, the more the money itself becomes directly contaminated, and thus devalued. Consistent with this view, people were less likely to want non-stolen money handled by a thief as compared to money without that history, but the non-stolen money was one step removed from the key morally objectionable event. We expect that similar effects would result in non-monetary judgments (e.g., if a murderer used a belt to strangle someone, we predict that people would view that belt as more negatively tainted than a belt that the murderer wore but did not use as a weapon). Of course, how people evaluate money from wrongdoers will depend on many things, including the nature of their misdeeds. For example, a dollar from a rapist may be more noxious than a dollar from a thief. Moreover, the relative influence of moral history and moral association could reverse, if the moral association is sufficiently troubling. For example, participants may report wanting a neutral dollar offered by a murderer less than a stolen dollar offered by a neutral person—or even a thief.

The current studies also argue against an alternative account, namely, that people did not want stolen money because they feared punishment. First, in Experiment 3, participants showed a similar aversion to stolen quarters as they did to stolen bills, even though quarters are not traceable like dollars. Second, in Experiment 4, we stipulated that only the thief would ever know that the money was stolen, and yet participants continued to show sensitivity to the moral history of money. Finally, in Experiment 5, participants continued to show an aversion toward stolen money even when it was stipulated that they could not get into trouble. Thus, the findings provide converging evidence for avoidance of stolen money under a variety of circumstances, and no hint of a lessening of the effect when the possibility of legal consequences is reduced. Nevertheless, it would be interesting in future research to further investigate whether the effects reported here extend to cases where there are no legal violations whatsoever (e.g., the so-called "blood money," where one receives compensation as restitution for a family member's death).

Although we have focused primarily on the response patterns of each sample as a whole, it is notable that we obtained variation in each of the experiments, with roughly half the participants indicating that they would not want stolen money and roughly half indicating some degree of wanting it.[1] A critical goal for future work involves understanding what could account for these differences—that is, why some people are more bothered by tainted money than others. For example, recent findings suggest that some people are extreme non-cooperators, who maximize their self-interest (Yamagishi, Li, Takagishi, Matsumoto, & Kiyonari, 2014), so perhaps participants in the current study who most indicated that they wanted the stolen money were of this type. More generally, it is important to note that the current studies were conducted within an industrialized Western context in which money is a unit of exchange among anonymous individuals. Future work should therefore investigate how other societies treat money based on its moral history. Following research documenting substantial cross-cultural variation in economic behavior (e.g., Blake et al., 2015; Henrich et al., 2005), much remains to be learned about how and whether culture shapes people's construal of money as morally contaminated.

Finally, it is important to examine whether beliefs about the moral taint of money represent a foundational way of thinking. Future work should investigate this question with children, who have less cultural knowledge and experience with money. Children reliably show contamination sensitivity by 5 years of age (Hejmadi, Rozin, & Siegal, 2005; Legare, Wellman, & Gelman, 2009), and thus could potentially show effects of moral contamination sensitivity with respect to money. At the same time, prior research indicates important developmental changes in children's economic behavior. Whereas adults are willing to incur personal costs to ensure equality between themselves and an anonymous stranger (e.g., an adult would rather share two dollars equally with a stranger, such that each receives one dollar, than receive two dollars and leave nothing for a stranger), this willingness does not seem to emerge until 7–8 years of age (e.g., Fehr, Bernhard, & Rockenbach, 2008; Sheskin, Bloom, & Wynn, 2014). These findings, in combination with recent work showing that young children behave more selfishly when handling monetary compared to non-monetary goods (Gasiorowska, Chaplin, Zaleskiewicz, Wygrab, & Vohs, 2016), suggest that attention to moral history may develop in tandem with children's increase in moral concern. Understanding this issue becomes important given our finding that moral history guides people's behavior and understanding of the material world.

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Note

1. In the *neutral-giver/bad-dollar* condition, the percentage of participants reporting that they did not want the money (i.e., responded 1 on the 7-point scale) was as follows: Experiment 1 (49%), Experiment 2 (44%), Experiment 3 (42%), Experiment 4 (36%), Experiment 5 (49%), and Experiment 6 (47%).

References

Belk, R. W., & Wallendorf, M. (1990). The sacred meanings of money. *Journal of Economic Psychology*, *11*, 35–67. doi:10.1016/0167-4870(90)90046-C

Blake, P. R., McAuliffe, K., Corbit, J., Callaghan, T. C., Barry, O., Bowie, A., Kleutsch, L., Kramer, K. L., Ross, E., Vongsachang, H., Wrangham, R., & Warneken, F. (2015). The ontogeny of fairness in seven societies. *Nature*, *528*, 258–261. doi:10.1038/nature15703

Chapman, H. A., & Anderson, A. K. (2014). Trait physical disgust is related to moral judgments outside of the purity domain. *Emotion*, *14*, 341–348. doi:10.1037/a0035120

Coulborn, W. A. L. (1950). *A discussion of money*. London: Longmans, Green, and Co.

Di Muro, F., & Noseworthy, T. J. (2013). Money isn't everything but it helps if it doesn't look used: How the physical appearance of money influences spending. *Journal of Consumer Research*, *39*, 1330–1342. doi:10.1086/668406

Douglas, M. (1967). Primitive rationing. In R. Firth (Ed.), *Themes in economic anthropology* (pp. 119–145). London: Tavistock.

Ertimur, B., Muñoz, C., & Hutton, J. G. (2015). Regifting: A multi-perspective processual overview. *Journal of Business Research*, *68*, 1997–2004. doi:10.1016/j.jbushres.2015.01.058

Fehr, E., Bernhard, H., & Rockenbach, B. (2008). Egalitarianism in young children. *Nature*, *454*, 1079–1083. doi:10.1038/nature07155

Friedman, O., Neary, K. R., Defeyter, K. A., & Malcolm, S. L. (2011). Ownership and object history. *New Directions for Child and Adolescent Development*, *132*, 79–89. doi:10.1002/cd.298

Galoni, C., & Noseworthy, T. J. (2015). Does dirty money influence product valuations? *Journal of Consumer Psychology*, *25*, 304–310. doi:10.1016/j.jcps.2014.11.002

Gasiorowska, A., Chaplin, L. N., Zaleskiewicz, T., Wygrab, S., & Vohs, K. D. (2016). Money cues increase agency and decrease prosociality among children: Early signs of market-mode behaviors. *Psychological Science*, *27*, 331–344. doi:10.1177/0956797615620378

Gelman, S. A., Frazier, B. N., Noles, N. S., Manczak, E. M., & Stilwell, S. M. (2015). How much are Harry Potter's glasses worth? Children's monetary evaluation of authentic objects. *Journal of Cognition and Development*, *16*, 97–117. doi:10.1080/15248372.2013.815623

Gelman, S. A., Manczak, E. M., & Noles, N. S. (2012). The nonobvious basis of ownership: Preschool children trace the history and value of owned objects. *Child Development*, *83*, 1732–1747. doi:10.1111/j.1467-8624.2012.01806.x

Haidt, J., McCauley, C., & Rozin, P. (1994). Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Personality and Individual Differences*, *16*, 701–713. doi:10.1016/0191-8869(94)90212-7

Hastings, J. S., & Shapiro, J. M. (2013). Fungibility and consumer choice: Evidence from commodity price shocks. *The Quarterly Journal of Economics*, *128*(4), 1449–1498. doi:10.1093/qje/qjt018

Hejmadi, A., Rozin, P., & Siegal, M. (2005). Once in contact, always in contact: Contagious essence and conceptions of purification in American and Hindu Indian children. *Developmental Psychology*, *40*, 467–476. doi:10.1037/0012-1649.40.4.467.

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., McElreath, R., Alvard, M., Barr, A., Ensminger, J., Smith Henrich, N., Hill, K., Gil-White, F., Gurven, M., Marlowe, F. W., Patton, J. Q., & Tracer, D. (2005). "Economic man" in cross-cultural perspective: Behavioral experiments in 15 small-scale societies. *Behavioral and Brain Sciences*, *28*, 795–815. doi:10.1017/S0140525X05000142

Hoigard, C., & Finstad, L. (1992). *Backstreets: Prostitution, money, and love*. Cambridge, UK: Polity Press.

Jones, A., & Fitness, J. (2008). Moral hypervigilance: The influence of disgust sensitivity in the moral domain. *Emotion*, *8*, 613–627. doi:10.1037/a0013435

Kardos, P., & Castano, E. (2012). Money doesn't stink, or does it? The effect of immorally acquiring money on its spending. *Current Psychology*, *31*, 381–385. doi:10.1007/s12144-012-9154-1

Landy, J. F., & Goodwin, G. P. (2015). Does incidental disgust amplify moral judgment? A meta-analytic review of experimental evidence. *Perspectives on Psychological Science*, *10*, 518–536. doi:10.1177/1745691615583128

Legare, C. H., Wellman, H. M., & Gelman, S. A. (2009). Evidence for an explanation advantage in naïve biological reasoning. *Cognitive Psychology*, *58*, 177–194. doi:10.1016/j.cogpsych.2008.06.002

Levav, J., & McGraw, A. P. (2009). Emotional accounting: How feelings about money influence consumer choice. *Journal of Marketing Research*, *46*, 66–80. doi:10.1509/jmkr.46.1.66

Nemeroff, C., & Rozin, P. (1994). The contagion concept in adult thinking in the United States: Transmission of germs and interpersonal influence. *Ethos*, *22*, 158–186. doi:10.1525/eth.1994.22.2.02a00020

Nemeroff, C., & Rozin, P. (2000). The makings of the magical mind. In K. S. Rosengren, C. N. Johnson, & P. L. Harris (Eds.), *Imagining the impossible: Magical, scientific, and religious thinking in children* (pp. 1–34). New York: Cambridge University Press.

Newman, G. E., & Bloom, P. (2014). Physical contact influences how much people pay at celebrity auctions. *Proceedings of the National Academy of Sciences*, *111*, 3705–3708. doi:10.1073/pnas.1313637111

Newman, G. E., Diesendruck, G., & Bloom, P. (2011). Celebration contagion and the value of objects. *Journal of Consumer Research*, *38*, 215–228. doi:10.1086/658999

Olatunji, B. O., Williams, N. L., Tolin, D. F., Abramowitz, J. S., Sawchuk, C. N., Lohr, J. M., & Elwood, L. S. (2007). The disgust scale: Item analysis, factor structure, and suggestions for refinement. *Psychological Assessment*, *19*, 281–297. doi:10.1037/1040-3590.19.3.281

Rozin, P., Millman, L., & Nemeroff, C. (1986). Operation of the laws of sympathetic magic in disgust and other domains. *Journal of Personality and Social Psychology*, *50*, 703–712. doi:10.1037/0022-3514.50.4.703

Rozin, P., Nemeroff, C., Wane, M., & Sherrod, A. (1989). Operation of the sympathetic magical law of contagion in interpersonal attitudes among Americans. *Bulletin of the Psychonomic Society*, *27*, 367–370. doi:10.3758/BF03334630

Sheskin, M., Bloom, P., & Wynn, K. (2014). Anti-equality: Social comparison in young children. *Cognition*, *130*, 152–156. doi:10.1016/j.cognition.2013.10.008

Shipton, P. (1989). *Bitter money: Cultural economy and some African meanings of forbidden commodities*. Washington, DC: American Anthropological Association.

Stellar, J. E., & Willer, R. (2014). The corruption of value: Negative moral associations diminish the value of money. *Social Psychological and Personality Science*, *5*, 60–66. doi:10.1177/1948550613484770

Thaler, R. H. (1990). Anomalies: Savings, fungibility, and mental accounts. *Journal of Economic Perspectives*, *4*, 193–205.

Uhlmann, E. L., & Zhu, L. K. (2013). Money is essential: Ownership intuitions are linked to physical currency. *Cognition*, *127*, 220–229. doi:10.1016/j.cognition.2013.01.001

Yamagishi, T., Li, Y., Takagishi, H., Matsumoto, Y., & Kiyonari, T. (2014). In search of *homo economicus*. *Psychological Science*, *25*, 1699–1711. doi:10.1177/0956797614538065

Zelizer, V. A. (1994). *The social meaning of money: Pin money, paychecks, poor relief, and other currencies*. New York: Basic Books.