



Journal of Consumer Research, Inc.

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Reviewed work(s):

Source: *Journal of Consumer Research*, (-Not available-), p. 000

Published by: [The University of Chicago Press](#)

Stable URL: <http://www.jstor.org/stable/10.1086/668406>

Accessed: 03/10/2012 17:35

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Money Isn't Everything, but It Helps If It Doesn't Look Used: How the Physical Appearance of Money Influences Spending

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Despite evidence that currency denomination can influence spending, researchers have yet to examine whether the physical appearance of money can do the same. This is important because smaller denomination bills tend to suffer greater wear than larger denomination bills. Using real money in the context of real purchases, this article demonstrates that the physical appearance of money can override the influence of denomination. The reason being, people want to rid themselves of worn bills because they are disgusted by the contamination from others, whereas people put a premium on crisp currency because they take pride in owning bills that can be spent around others. This suggests that the physical appearance of money matters more than traditionally thought, and like most things in life, it too is inextricably linked to the social context. The results suggest that money may be less fungible than people think.

When the US Federal Reserve receives a cash deposit from a bank, it checks the individual notes to see whether they are still fit for circulation. About one-third of notes received by the Fed are deemed unfit and subsequently destroyed (Federal Reserve Bank of New York 2008). This is why most of the currency produced each year in the United States replaces old, worn-out currency. Of course, some notes are more susceptible to wearing out. A \$1 bill gets the greatest use and thus remains in circulation for about 18 months, whereas a \$100 bill gets the least use and thus

lasts approximately 9 years (US Department of the Treasury 2011). This is important because the relationship between wear and denomination correlates with the relationship between filth and denomination (Abrams and Waterman 1972). In fact, the primary reason for replacing currency is not wear but instead what the Federal Reserve refers to as *soil content* (Reilly 2009). Soil content is the amount of bacteria living on a banknote. A new bill scores about 16 on a descending scale (i.e., the scoring goes down as the bacterial content increases). Any bill scoring 12 or less is removed from circulation (Reilly 2009). Yet how do we reconcile this provision with the general belief that money *is* contaminated? At one time or another, we have all witnessed or felt victim to a mother shouting “do not put that money in your mouth!” Are consumers wary of dirty money enough to make inferences on the basis of physical appearance? If so, would these inferences alter spending?

In answering the above, this research makes several unique and important contributions. First, our findings suggest that the physical appearance of money can alter spending behavior. Specifically, people generally spend more when they have worn bills and spend less when they have crisp bills. Second, we find that the physical appearance of money can enhance, attenuate, and even reverse prior findings on the influence of denomination on spending. Third, we identify a push-and-pull emotional mechanism. People want to rid themselves of worn currency because they are disgusted by the contamination from others. However, people put a pre-

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Ann McGill served as editor and Darren Dahl served as associate editor for this article.

Electronically published October 3, 2012

mium on crisp currency because they take pride in owning bills that can be spent around others. Hence, as a final contribution, we illustrate the moderating effect of social context. People tend to spend crisp bills more when they believe they are being socially monitored. Given that pride (a distinct positive emotion) and disgust (a distinct negative emotion) allow people to respond to adaptive challenges in the social environment, the results of this study illustrate that even currency, like the goods it procures, is not immune to the greater social context of consumption.

CONCEPTUAL BACKGROUND

Researchers exploring the influence of currency denomination on spending have shown that consumers often violate the economic principle of *descriptive invariance*, which is the idea that different representations of the same choice problem should lead to equivalent preferences (Kahneman and Tversky 1979). One of the most notable examples is the observation that people spend less when given a larger denomination (e.g., a \$20 bill) than when given the equivalent amount in smaller denomination notes (e.g., four \$5 bills; Mishra, Mishra, and Nayakankuppam 2006; Raghurir and Srivastava 2009). One explanation is that people put a premium on large single denominations because there is greater processing fluency with the whole rather than several subsequent parts (Mishra et al. 2006; Alter and Oppenheimer 2008). The general idea is that greater processing fluency translates into positive affect toward the money, which in turn leads people to overvalue large single denominations.

Raghurir and Srivastava (2009, 702) propose an alternate explanation; they argue that large single denominations are simply “perceived as less fungible” than smaller denominations. Using the theory of mental accounting (Thaler 1985; Thaler and Shefrin 1981), the authors suggest that people may perceive a large denomination of money as real money, whereas an equivalent amount in smaller denominations is seen as petty cash or loose change (Raghurir and Srivastava 2009). Add to this that people have norms that govern their spending patterns, with tighter controls for the spending of real money versus petty cash, and this particular violation of descriptive invariance may simply derive from a need to exercise self-control in spending (Raghurir and Srivastava 2009; Thaler and Shefrin 1981). This phenomenon has been aptly coined the *denomination effect* (Raghurir and Srivastava 2009).

The denomination effect is predicated on the idea that people tend to see only the nominal value (i.e., the face value) of money. This phenomenon explains why income satisfaction is typically not based on purchasing power but rather on the number of monetary units obtained. That is, people are generally satisfied with a higher nominal pay, despite their real income decreasing due to inflation (Shafir, Diamond, and Tversky 1997). This also explains why people tend to believe that products priced in low currency units (e.g., euros) are cheaper than products priced in high currency units (e.g., Swedish crowns), despite the real price being static between the two (Gamble et al. 2002; Raghurir

and Srivastava 2002). However, although people may be poor at adjusting for the real value of money (i.e., the buying power of money), this does not mean that when consumers look at a banknote they only see its numerical value.

Indeed, money is said to be fungible. If someone lends another person a \$20 bill, it should not matter if they are given back the same \$20 bill or a different one. This is why diamonds, real estate, and art are not suitable as money. Although this example is widely used to illustrate the concept of fungibility, it either assumes that all bills look the same or that it would not matter if they differed. Yet would it not matter if someone were given a worn \$20 bill in exchange for being lent a crisp and clean \$20 bill? The nominal value between the bills is interchangeable, but the inferences consumers draw may not be. Researchers have shown that consumers put less value on a product when it has been touched by others (Argo, Dahl, and Morales 2006). This phenomenon has been referred to as *negative contamination*. Indeed, this makes sense when talking about consumer goods. The question is whether subjective assessments of value can alter perceptions of something that is an explicit store of value.

Negative Contamination

Some of the earliest work on contamination appeared in the late 1800s and early 1900s. This work centered on the laws of sympathetic magic (Frazer 1890/1959; Mauss 1902/1972; Tylor 1871/1974). A key component of the laws of sympathetic magic is the law of contagion, which states that when a source (a person or object) and a target (another person or object) come into direct or indirect contact, the source can transfer some, if not all, of its properties to the target (Rozin and Nemeroff 1990). According to the law of contagion, the target retains the properties received from the source even after the contact has been broken (Rozin and Nemeroff 1990). An important element of the law of contagion is that the target does not need to observe or directly experience contact for contamination to occur (Rozin et al. 1989). Indeed, consumers rarely see others trying on clothes or touching a particular product. They merely infer contact because they have similar access (O’Reilly et al. 1984). In the case of money, the physical appearance of the bill (whether it is worn or crisp) is often enough to infer frequency of use.

The majority of the work examining contamination in marketing has focused on negative contamination (i.e., when the value of an object is *decreased* through actual or perceived contact; Argo et al. 2006; Morales and Fitzsimons 2007; but see Argo, Dahl, and Morales 2008). For instance, Argo et al. (2006) found that consumers not only have lower evaluations but are less likely to purchase and are willing to pay less for a previously touched product. This is without formally observing the product being touched. An important finding to emerge from this research was that disgust was the driving mechanism. In fact, researchers have demonstrated that disgust drives negative contamination in a variety of settings, such as moral taint, disease, food, and retail

(Argo et al. 2006; Morales and Fitzsimons 2007; Rozin, Markwith, and Nemeroff 1992).

The Motivational Effects of Disgust

Prior work defines disgust as “a revulsion at the prospect of (oral) incorporation of an offensive substance” (Rozin and Fallon 1987, 23). Although the definition suggests that feelings of disgust can be elicited through physical contact, researchers have shown that being physically proximate to a disgusting object, or merely thinking about touching a disgusting object, can be enough to elicit the discrete negative emotion (Morales and Fitzsimons 2007). What is important about disgust is that it motivates individuals to reject and/or devalue the source of contamination (Argo et al. 2006; Morales and Fitzsimons 2007; Rozin and Fallon 1987; Rozin et al. 1989; Rozin and Nemeroff 1990). This becomes rather interesting when considered in the context of money.

Although people may not think of money as perishable, they tend to have strong normative beliefs that money is dirty, and rightfully so. Researchers have documented harmful germs like fecal bacteria on 13% of coins and 42% of bills (Abrams and Waterman 1972). These statistics fit the notion that disgust derives from something organic, such as feces, insects, worms, and human/animal parts (Angyal 1941). Of course, it would be impossible for a consumer to make accurate estimates of the level of bacteria on a bill; the Federal Reserve relies on a sophisticated machine. What consumers can do, however, is make inferences on the basis of the banknote’s physical appearance. If consumers hold the belief that money is dirty, it seems plausible that they would believe a worn banknote is more contaminated than a crisp banknote. This suggests that consumers may value a crisp banknote more than a worn banknote because they believe the latter is disgusting and thus want to be rid of it. This would challenge the fundamental belief that people tend to only perceive the nominal (face) value of money (Shafir et al. 1997). The following studies were designed to test this prediction.

PILOT STUDY

The purpose of the pilot was to test whether the physical appearance of money can alter behavior. To accomplish this, several banknotes were gathered from a local bank. Brand new bills were chosen to represent crisp currency, whereas old, faded, and otherwise tattered bills were chosen to represent worn currency. A pretest ($n = 48$) was conducted to confirm that the bills were perceived as intended. The pretest randomly displayed 30 of the notes (five crisp/worn \$5 bills, five crisp/worn \$10 bills, and five crisp/worn \$20 bills). Participants were asked to make repeated judgments (“how worn out is this banknote?”) on a scale from 1 (*not at all worn*) to 9 (*very worn*). A repeated measures ANOVA, with type of banknote nested within denomination, confirmed that the worn bills were judged as more worn ($M = 5.81$) than the crisp bills ($M = 3.91$; $F(1, 47) = 37.86, p < .001$). This effect did not vary by denomination ($F < 2$).

Participants and Design

Undergraduate students at the University of Winnipeg ($N = 110$; 55% female) participated in this study for a chance to win \$20. Participants were randomly assigned to one of four conditions in a 2 (award: worn \$10 vs. crisp \$10) \times 2 (gamble: worn \$20 vs. crisp \$20) between-subjects design. The task was introduced as an adaptive intelligence test. Participants were told that they would see 15 anagram puzzles. If they were to solve between 80% and 90% of the anagrams correctly, they would receive \$10. However, if they solved over 90%, they would receive \$20. Unknown to the participants, two of the anagrams were impossible to solve. Hence, they could never score higher than 87% (i.e., they could never solve more than 13 of the 15 anagrams). Nevertheless, all participants were able to score above 80%. Thus, the task was designed such that a \$10 endowment was guaranteed.

After participants had finished the anagram task, they were awarded the \$10 prize as either a worn or crisp \$10 bill. They then received the following statement: “Congratulations—you scored over 80%. Hence, you receive \$10 for your performance. Although you didn’t score above 90% to earn the \$20 prize, you have the option to gamble the \$10 you just earned on ONE final anagram question. If you get the question wrong, however, you will lose the \$10, but if you get it right, you will get *this* \$20 bill.” The research assistant then instructed participants to open an adjacent envelope to retrieve either a worn or crisp \$20 bill as indication of what could be won. Participants that accepted the gamble received the final anagram and then filled out a short demographic questionnaire. Those that declined went straight to the questionnaire. Following the study, participants took part in a debrief session to ascertain the efficacy of the bills.

Results and Discussion

Consistent with the prediction that the physical appearance of money can alter behavior, a binary logistic regression (0 = no gamble; 1 = gamble) revealed a significant prize \times gamble interaction (Wald $Z = 4.29, p < .05$). The nature of the interaction was such that participants who were awarded a worn bill and enticed with a crisp bill were more likely to gamble (67.9%) than were participants who were awarded a crisp bill and enticed with a worn bill (29.6%; $B = -1.61$, standard error [SE] = .58, $p < .01$, odds ratio [OR] = .20). These same participants were more likely to gamble—albeit only marginally so—than participants who were awarded and enticed only with worn bills (67.9% vs. 44.4%; $B = -.97$, SE = .56, $p = .08$, OR = .38) or awarded and enticed only with crisp bills (67.9% vs. 46.4%; $B = -.89$, SE = .55, $p = .10$, OR = .41).

At first glance, the results seem to support the prediction that the physical appearance of money can alter the degree to which people seek to divest worn banknotes and to acquire and retain crisp banknotes. Yet despite the predicted pattern of effects, several alternate explanations emerged during the pilot study debrief. Two of the most commonly

listed by participants were differences in perceived store of value (particularly given the lack of control in whether the bills were visibly tattered) and differences in perceived novelty (with respect to the printing style of the bills). Hence, there was a need to establish a more controlled manipulation for the worn currency condition to isolate the phenomenon and distinguish the mechanism.

STUDY 1: THE GAMBLING STUDY (REDUX)

Study 1 followed the same design and procedures as the pilot study with one key modification: the manipulation of worn currency was accomplished by altering brand new banknotes. The notes were folded and crumpled until they were relatively equivalent to one another in visual appearance. Care was taken to ensure that the notes were not old in terms of printed date. Once gathered, a pretest ($n = 50$) was conducted to confirm the manipulation. As in the pilot study, the pretest randomly displayed 30 of the notes, and participants were asked to make repeated worn judgments. Participants were then asked to evaluate either a worn or crisp bill (quasi-randomized to equalize conditions) on six 9-point items (anchored 1 = not likely, 9 = extremely likely) to capture the bill's store of value (will hold its value; will last a long time; will get damaged [reverse coded]; will be reliable; will be dependable; will remain durable, $\alpha = .79$; adapted from Dodds, Monroe, and Grewal 1991). The questionnaire concluded with four 9-point items that collectively captured the bill's perceived novelty (anchored: original/unoriginal; not novel/very novel; regular/irregular; common/uncommon, $\alpha = .72$; adapted from Holbrook [1981]).

Consistent with the pilot study, a repeated measures ANOVA, with physical alteration nested within denomination, confirmed that the altered banknotes were judged as more worn ($M = 6.18$) than the unaltered banknotes ($M = 4.06$; $F(1, 49) = 66.94, p < .001$). Importantly, this effect did not vary by denomination ($F < 1.2$). Equally important, the analysis of store of value and perceived novelty yielded no significant effects (all $F < 2$). The pretest confirmed that the manipulation worked as intended, and it did not alter perceptions of novelty or store of value.

Results and Discussion

Undergraduate students ($N = 84$; 42% female) participated in this study in exchange for a \$20 endowment. Consistent with the pilot results, there was a significant prize \times gamble interaction (Wald $Z = 6.21, p < .05$). Once again, participants who were awarded a worn bill and enticed with a crisp bill were more likely to gamble (80.1%) than participants who were awarded a crisp bill and enticed with a worn bill (22.7%; $B = -2.61, SE = .76, p < .001, OR = .07$). These same participants were more likely to gamble than participants who were awarded and enticed only with worn bills (80.1% vs. 47.6%; $B = -1.48, SE = .71, p < .05, OR = .23$) or awarded and enticed only with crisp bills (80.1% vs. 38.1%; $B = -1.87, SE = .72, p < .01, OR =$

.15). The results confirm the prediction that the physical appearance of money can alter the degree to which people seek to divest worn banknotes and to acquire crisp banknotes.

Given that a bill's physical appearance tends to correlate with its denomination, such that lower denominations suffer greater wear than larger denominations, there is the question as to which effect is stronger? If the physical appearance of money is a strong enough inferential cue to motivate approach or avoidance behavior, then it seems reasonable that it should alter spending and do so to such an extent that it overrides the influence of denomination. Study 2 was designed to test this prediction.

STUDY 2: THE SPENDING STUDY

Design and Procedures

Undergraduates at the University of Winnipeg ($N = 120$; 51% female) participated in this study in exchange for a \$20 endowment. Individuals were tested one at a time in a mock retail lab. Participants were randomly assigned to one of four conditions in a 2 (physical appearance: worn vs. crisp) \times 2 (denomination: four \$5 bills vs. a \$20 bill) between-subjects design. The study began with the following instructions: "In this study, you will participate in a shopping task. You will be given \$20 to spend. You can spend as much or as little as you like. You will get to keep the money that you don't spend, as well as any of the products that you choose to buy. Below you will find a listing of products (and their prices). These products will be available at the front of the room." The study was conducted under the guise that we were interested in how students prioritize their spending. Twenty-six products were purchased from a local retailer. The prices of the products ranged from \$3.40 (Lays chips) to \$16.25 (Cadbury chocolate box). To reinforce the guise, the product list was made up of junk food and personal care items (e.g., toothpaste, shampoo, etc.). Participants completed a short questionnaire after paying for the merchandise.

The questionnaire began by asking participants to judge the degree to which the bill(s) they used was/were worn out (anchored 1 = not at all worn, 9 = very worn). Participants then responded to two 9-point items (anchored 1 = not at all, 9 = extremely) that captured perceived contamination ("How dirty was/were the bill(s) you just used?" and "How unsanitary was/were the bill(s) you just used?" adapted from Argo et al. 2006). Following these two items, perceived value was measured by 13 of the 9-point items (anchored 1 = strongly disagree, 9 = strongly agree) that tapped participants' perceptions of value (has consistent quality; is well made; has poor workmanship; would not last a long time; would perform consistently; one that I would enjoy; something that I would want to use; something that I would feel relaxed about using; would give me pleasure; would help me to feel accepted; would improve the way I am perceived; would make a good impression on others; would give its owner social approval; Sweeney and Soutar 2001).

The instrument concluded with basic demographic questions.

Results

Manipulation Check—Physical Appearance. Consistent with the study 1 pretest, consumers rated the altered bills as more worn out ($M = 6.47$) than the unaltered bills ($M = 3.23$; $F(1, 116) = 120.07, p < .005, \eta^2 = .51$). Importantly, the main effect of denomination on physical appearance was not significant ($F < 1$). Neither was the physical appearance \times denomination interaction ($F < 1$). Hence, the manipulation of physical appearance worked as intended.

Consumer Spending. A two-way ANOVA revealed a significant physical appearance \times denomination interaction ($F(1, 116) = 3.96, p < .05, \eta^2 = .02$). As illustrated in table 1, simple effects revealed the nature of the interaction was such that the influence of denomination varied by the physical appearance of the banknotes. Specifically, the denomination effect was robust in the worn currency condition ($M_{4\times\$5} = \13.35 vs. $M_{\$20} = \8.35 ; $F(1, 116) = 10.64, p < .005, \eta^2 = .09$). However, it did not manifest in the crisp currency condition ($F < 1$). Like study 1, the pattern of effects was even more informative when broken down by condition. Planned contrasts revealed that the denomination effect was most pronounced when consumers had four worn \$5 bills ($M = \13.35) compared to a crisp \$20 bill ($M = \3.68; $t(116) = -6.30, p < .001, d = 1.71$). However, contrary to the denomination effect, consumers with a worn \$20 bill spent more ($M = \8.34) than consumers with four crisp \$5 bills ($M = \4.59; $t(116) = 2.44, p < .05, d = .59$). The results confirm the physical appearance of money can override the influence of denomination.

Negative Contamination. The two contamination items were averaged to form a contamination index ($r = .78$). As expected, consumers believed the worn bills were more contaminated ($M = 3.54$) than the crisp bills ($M = 2.57$; $F(1, 116) = 35.68, p < .001, \eta^2 = .22$). There was also a marginally significant effect of denomination on contamination; consumers believed the \$5 bills were somewhat more contaminated ($M = 3.19$) than the \$20 bill ($M = 2.93$; $F(1, 116) = 2.91, p = .10, \eta^2 = .02$). The interaction between

the physical appearance of money and denomination was not significant ($F < 1$). The marginal effect of denomination affords some insight into peoples’ normative beliefs about money; consumers may assume smaller bills have been touched more because they themselves use them more often.

To test whether contamination mediated the relationship between the physical appearance of money and spending, the indirect effect and the standard error of the indirect effect were estimated using a bias-corrected bootstrap with 5,000 draws (MacKinnon, Lockwood, and Williams 2004). As illustrated in figure 1, there was a significant indirect effect of physical appearance on spending through contamination (95% CI: $-4.82, -1.70$). However, the direct effect of physical appearance on spending remained significant (path c' ; $B = -3.61, SE = 1.14, p < .005$). Importantly, this did not vary by denomination. When denomination was added as a moderator to the model, it did not alter any of the paths or change the indirect effect.

Perceived Value. Given the above, the question remained whether people personally value worn and crisp bills differently. An initial examination of the 13 items of perceived value revealed that the internal consistency among the measures was rather low given the number of items and prior work ($\alpha = .63$). An exploratory factor analysis revealed that the scale could be broken down into two conceptually distinct and intuitive components. Specifically, a scree test and parallel analysis supported a two-component solution, yielding eigenvalues of 4.24 and 3.32, respectively. The second component relates to the object in question (has consistent quality; is well made; has poor workmanship; would not last a long time; would perform consistently; $\alpha = .79$). The first component relates somewhat to the social environment and what it would mean to own the bills (something I would want to use; something I would feel relaxed about using; would give me pleasure to use; would help me to feel accepted; would improve the way I am perceived; would make a good impression on others; would give its owner social approval; $\alpha = .91$).

The component that relates to the evaluation of the object (henceforth referred to as perceived object value) and the component that relates to the ownership of the object (henceforth referred to as perceived ownership value) were ex-

TABLE 1

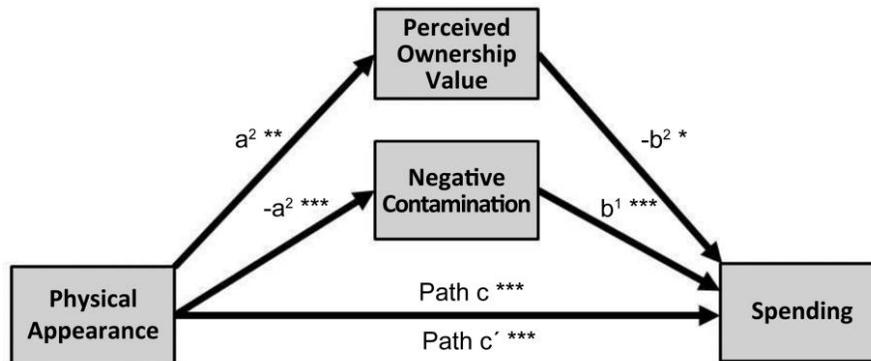
TREATMENT MEANS, STANDARD DEVIATIONS, AND CELL COUNTS FOR STUDY 2

	Crisp bills		Worn bills	
	Four \$5 bills	One \$20 bill	Four \$5 bills	One \$20 bill
Amount spent	\$4.59 (5.29) ^a	\$3.68 (4.06) ^b	\$13.35 (6.46) ^{a,c}	\$8.35 (6.61) ^{b,c}
Worn judgments	003.43 (1.53) ^a	003.03 (1.44) ^b	006.39 (1.61) ^a	006.53 (1.54) ^b
Proposed mechanisms				
Negative contamination	002.73 (0.82) ^a	002.41 (1.79) ^b	003.67 (0.86) ^a	003.41 (0.91) ^b
Perceived object value	006.36 (1.12) ^a	006.53 (1.33) ^b	006.07 (1.27) ^a	006.11 (1.29) ^b
Perceived owner value	005.95 (1.11) ^a	005.99 (1.17) ^b	004.87 (1.18) ^a	005.08 (1.24) ^b
Cell size	30	30	30	30

NOTE.—Standard deviations are reported in parentheses; significant contrasts are identified with superscript notation.

FIGURE 1

MEDIATION MODEL FOR STUDY 2



pored separately. In line with the study 1 pretest for store of value, the manipulation of physical appearance, denomination, and the interaction between the two did not significantly influence perceived object value (all $F < 1.6$). There was, however, a significant effect of physical appearance on perceived ownership value; consumers believed that crisp currency offered more ownership value ($M = 5.98$) than worn currency ($M = 4.97$; $F(1, 116) = 10.53, p < .005, \eta^2 = .08$).

An analysis of whether perceived contamination mediated the relationship between physical appearance and perceived ownership value yielded no significant result. As illustrated in figure 1, when perceived ownership value was added to the mediation model, the results revealed a significant indirect effect of physical appearance on spending through perceived ownership value (95% CI: $-1.64, -.12$). However, the direct effect of physical appearance remained significant (path c' ; $B = -3.06, SE = 1.14, p < .01$). Like the contamination results, these effects did not vary by denomination. What was most informative, however, was that ownership value seemed to be tapping a different mechanism than contamination. Ownership value was explaining why people sought to retain the crisp bills (negative b^2 beta in fig. 1), whereas contamination was explaining why people sought to spend the worn bills (positive b^1 beta).

Discussion

The mediation analysis for contamination confirmed that the worn bills were seen as more contaminated, and this led individuals to divest those particular banknotes. However, negative contamination, or the lack thereof, could not explain why people retained the crisp and clean banknotes. The effect was being driven by something else entirely. Participants saw greater personal and social utility in owning crisp banknotes. This raises the interesting possibility that there may be more than one discrete emotion at play.

Emotions serve to enable individuals to respond to adap-

tive challenges. Many of these challenges involve the successful navigation of the social environment and thus necessitate a socially oriented emotional response (Williams and DeSteno 2009). As mentioned, negative contamination tends to operate on the discrete emotion of disgust (Argo et al. 2006). This would fit the common belief that money is dirty. Hence, it seems reasonable that disgust may be the driving mechanism for why people divest worn currency. The question is, what could be causing people to see greater social utility in retaining crisp currency?

The Motivational Effects of Pride

Thorstein Veblen (1899) coined the term *conspicuous consumption* to describe the acquisition and display of possessions with the intention of gaining social status. Researchers have shown that pride is the motivating force for why individuals engage in costly efforts to “increase one’s status and value to one’s social group” (Williams and DeSteno 2009, 284). Indeed, the items in the ownership value scale say more about the social exchange than about the banknote’s actual value. This would fit the idea that pride is most prevalent in situations of public appraisal (Webster et al. 2003). Recently, pride has been shown to serve a similar motivational function as disgust but operate on the positive end of the spectrum (Mascolo and Fischer 1995; Williams and DeSteno 2008, 2009). Two types of pride are thought to exist. The first type is hubristic (alpha) pride, which refers to an overly positive view of the self that could result in negative social consequences (Lewis 1997; Tangney 1999). The second type of pride is referred to as authentic (beta) pride, which arises from a specific outcome, such as performing a certain task well, or *acquiring an object of value* (Tangney 1999; Tracy and Robins 2004). This type of pride is thought to facilitate adaptive behaviors and enhance social capital. Beta pride would account for the belief that owning a crisp bill will lead to social approval.

Beta pride (henceforth referred to as pride) is believed to

“motivate behaviors geared toward long-term status attainment” (Tracy and Robins 2007a, 150). Hence, unlike generalized positive affect, it is thought to encourage people to incur short-term costs for greater social benefit (Tracy and Robins 2007b; Williams and DeSteno 2009). This would explain why in study 1, the risk of losing a \$10 bill was offset by the social benefit of gaining a crisp \$20 bill. Furthermore, despite reversing the denomination effect, there is no reason to believe that the appearance of money altered participants’ mental accounts. Like disgust, pride is a strong motivational force, which could seemingly override one’s controls for real money relative petty cash (i.e., people will break an account for greater social utility). If so, disgust and pride should play distinct roles in explaining how the physical appearance of money influences spending.

STUDY 3: THE CHANGE STUDY

Of course, barring any personal motivation to carry smaller denomination bills (e.g., the desire to get a coffee on the way to work), it is far more common when purchasing a product to pay the exact amount than to arbitrarily break a larger bill. A pretest ($n = 30$) was conducted to illustrate this point. Participants were given \$18 and then read a scenario suggesting they were missing three key ingredients for a recipe. They were then given a list of products that was purportedly taken from a real grocery store. The list offered several alternatives for each ingredient (e.g., white mushrooms or shiitake mushrooms). This was done to mask the purpose of the pretest. Regardless of which ingredients were chosen, the total cost could never exceed \$8. Participants were asked to pay for the products just as they would in a real store, and they were told to keep the remaining money for participating. The results revealed that participants were more likely to pay the exact amount (87%) as opposed to breaking a larger bill (13%; $\chi^2(1) = 16.13, p < .001$). This illustrates how people tend not to divest a larger denomination bill for something that could be easily paid for with lower denominations. Yet, what happens when that larger denomination bill is worn and the lower denominations are crisp and clean?

Design and Procedures

Undergraduates at the University of Winnipeg ($N = 70$; 43% female) participated in exchange for an \$8 product and a \$12 participation fee (\$20 total value). Upon entering the retail lab, individuals were given a small black wallet and asked to count the contents. Within the wallet was \$20 in the form of a \$10 bill, a \$5 bill, two \$2 bills, and a \$1 bill. Participants were randomly assigned to whether the \$10 bill was worn or crisp. All other bills were brand new. The purpose of the wallet was to make the purchase scenario as realistic as possible and to avoid making participants overly sensitive to differences in denomination or appearance. This was particularly important in this study because the worn \$10 bill was seen alongside crisp currency.

Participants chose among 16 products priced around \$8

each. Again, to reinforce the guise, the product list was made up of both junk food and personal care items. The study began with the following instructions: “We are examining how students prioritize their spending when required to make a purchase. Today you will have the opportunity to purchase a product. To ensure that there are enough products for everyone, we ask that you purchase only ONE product. You have been given \$20, and the cost of each product is around \$8. Because the regular compensation for participation is approximately \$10, you will be allowed to keep the remaining money.” The rationale for restricting choice to one item was to isolate whether participants incurred change by breaking a larger bill or whether they paid the exact amount in smaller denominations. Once participants finished shopping, they paid for the product and then completed a questionnaire.

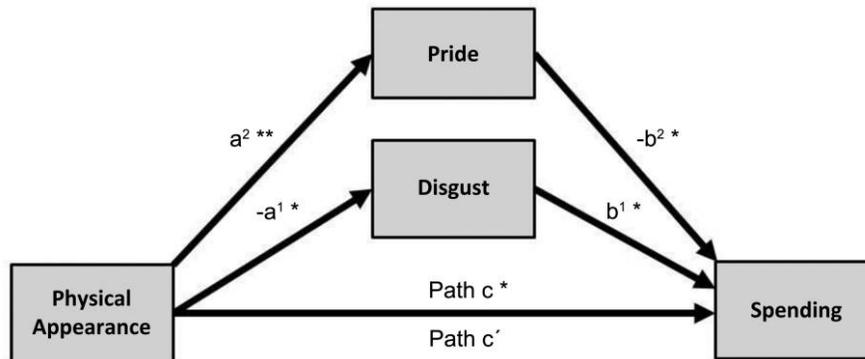
The questionnaire instructed participants to focus specifically on the \$10 banknote and how it made them feel, and began with 15 randomized 9-point items (anchored 1 = not at all, 9 = extremely). Four of the items captured perceived disgust (disgusted; unclean; dirty; revolted; Morales and Fitzsimons 2007). Five items captured pride of ownership (proud; satisfied; confident; accomplished; self-fulfilled; Williams and DeSteno 2008, 2009). The remaining six items were made up of filler adjectives to mask the nature of the two scales (e.g., scared, relaxed, etc.). The instrument once again concluded with basic demographic questions.

Results and Discussion

Consistent with the results of studies 1 and 2, participants were more likely to break the \$10 bill when the bill was worn (28.6%) than when it was crisp (5.7%; $\chi^2(1) = 7.65, p < .05, \phi = .33$). Prior to exploring whether discrete emotions were driving this effect, disgust ($\alpha = .83$) and pride ($\alpha = .89$) were analyzed separately. Consistent with the prediction of a push-and-pull mechanism, participants believed the worn \$10 bill was more disgusting ($M = 3.60$) than the crisp \$10 bill ($M = 2.78$; $F(1, 68) = 5.56, p < .05, \eta^2 = .07$). However, participants reported greater pride of ownership for the crisp \$10 bill ($M = 5.16$) than for the worn \$10 bill ($M = 4.11$; $F(1, 68) = 10.28, p < .005, \eta^2 = .12$). Not surprisingly, the correlation between participants’ pride and disgust was negative and significant ($r = -.26, p < .05$). As illustrated in figure 2, the mediation model yielded a significant indirect effect of physical appearance on spending through disgust (95% CI: $-.72, -.03$). However, the direct effect of physical appearance on spending remained significant (path c' ; $B = -.79, SE = .41, p < .05$).

When pride was added to the model, the results not only yielded a significant indirect effect of physical appearance on spending through pride (95% CI: $-1.36, -.11$), but the direct effect of the physical appearance on spending fell to nonsignificance (path c' ; $B = -.33, SE = .47, p = .46$). Most importantly, the unstandardized betas confirmed that people indeed saw the worn \$10 bill as more disgusting (negative a^1 beta), and this led them to spend the bill (pos-

FIGURE 2
MEDIATION MODEL FOR STUDY 3



itive b^1 beta). However, people saw the crisp \$10 bill as offering greater pride of ownership (positive a^2 beta), and this in turn led them to retain the bill (negative b^2 beta). Although both mechanisms are equally informative and interesting in their own right, pride is a bit more pragmatic than disgust because it can only be exercised in a social context by divesting the source of pride (Williams and DeSteno 2009). This is the defining feature that makes pride distinct from generalized positive affect. If so, the influence of pride on spending may reverse in a consumption context where consumers are given the opportunity to extract social utility. This prediction is important because it assists in ruling out several competing explanations for the phenomenon.

One of the most plausible explanations centers on the concept of psychological ownership and endowment. Peck and Shu (2009) found that the sensation of touch can result in greater feelings of ownership, which in turn can lead to increased valuation. This only happens for objects that are pleasant to touch. Conversely, for objects that are unpleasant to touch, the authors observed greater psychological ownership but no increase in valuation. This raises the distinct possibility that the observed effects may have something to do with haptic perception. Indeed, if consumers see worn currency as more disgusting than crisp currency, it follows that they would be less likely to touch the worn currency. Thus, consumers would experience greater psychological ownership for the crisp currency, which leads to a greater valuation. This is consistent with the endowment effect (Kahneman, Knetsch, and Thaler 1990; Thaler 1980). As a result, touch and endowment would predict that consumers are more likely to hold onto crisp currency and dispense worn currency, a prediction that is consistent with the results thus far.

With that said, greater psychological ownership leads to greater feelings of loss if the item in question is given up (Peck and Shu 2009). Hence, if the social context can cause people to spend crisp bills as opposed to save them, then one would be hard pressed to argue in favor of psychological ownership or endowment. Beyond solidifying the role of

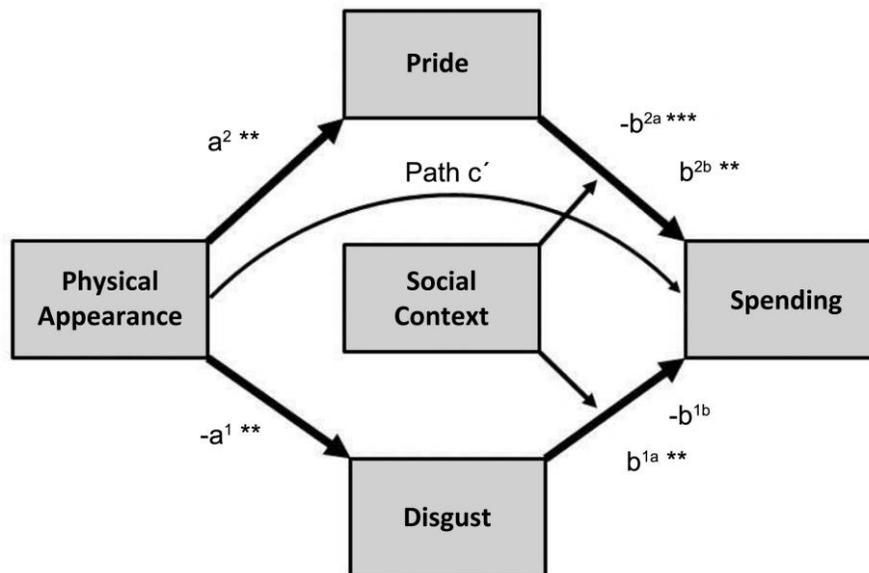
pride, the social context also assists in solidifying the role of disgust. Peck and Shu (2009, 445) argued “objects that are frequently traded (i.e., stocks, money) may be legally owned and yet low in perceived ownership, resulting in an ability to forfeit them without ‘feeling the loss.’” This certainly applies to worn bills, as they appear as if frequently traded. Thus, consumers might spend worn bills because they do not code the action as a loss (Shu and Peck 2011). This explanation would also be consistent with the results of the earlier studies. Once again, if so, then the social context will be irrelevant. However, if this is about discrete emotions that allow people to respond to adaptive challenges in the social environment, then the social context may be the most relevant factor yet.

STUDY 4: THE SOCIAL STUDY

Study 4 followed the same procedures as study 3 with the following modifications. First, to test the influence of social context, undergraduates at the University of Winnipeg ($N = 120$; 55.8% female) were randomly assigned to one of four conditions in a 2 (physical appearance: worn \$10 vs. crisp \$10) \times 2 (consumption context: private vs. public) between-subjects design. Upon entering the retail lab, participants were given a wallet containing \$20 in the form of a worn (crisp) \$10 bill, a crisp \$5 bill, and five crisp \$1 bills. The study began with the same instructions listed in study 2. Hence, unlike study 3, participants were not constrained to selecting only one product.

In the private consumption condition, participants went through the same procedures described in study 3. In the public consumption condition, participants were initially brought into the mock retail lab in groups of 10. They were told that we are interested in how students interpret how *other students* prioritize their spending. Participants were informed that although they will take part in the shopping task alone, they were nevertheless brought together as a group to sign a release stating that it is okay for their peers

FIGURE 3
MODERATED MEDIATION CONCEPTUAL MODEL FOR STUDY 4



NOTE.—Superscript “a” = private consumption; superscript “b” = public consumption.

(i.e., the other individuals in the room) to watch a video recording of them going through the task (a guise). The release form required participants to agree to take part in the shopping task and to agree to evaluate the videos of their peers at an unspecified later date (another guise). The students were then directed to two video recorders situated strategically in the lab: one focusing on the product display to capture product choice and the other focusing on the cashier’s table to capture the transaction.

Results and Discussion

Overall, there was a significant physical appearance \times social context interaction on spending ($B = .89$, $SE = .30$, $p < .005$). The nature of the interaction was such that the results of study 3 replicated in the private consumption condition. Specifically, participants were more likely to break the \$10 bill when it was worn (36.7%) than when it was crisp (10.0%; $\chi^2(1) = 5.96$, $p < .05$, $\phi = .31$). However, contrary to the results of study 3, participants in the public consumption condition were more likely to break the \$10 bill when it was crisp (23.3%) than when it was worn (3.3%; $\chi^2(1) = 5.19$, $p = .052$, $\phi = .29$). As an aside, this was the only study to reveal a major difference between participants’ choice of junk food and personal care items. Consistent with the idea that participants were altering their behavior in light of social monitoring, 83% of participants chose a junk food item in the public consumption condition

(studies 2 and 3, as well as the private consumption condition did not exceed 65%).

To test the underlying mechanisms, a moderated mediation analysis was conducted (Muller, Judd, and Yzerbyt 2005; Preacher, Rucker, and Hayes 2007). A bootstrap with 5,000 draws was administered to examine the conditional indirect effects (Hayes 2012, model 14). As expected, disgust ($\alpha = .85$) mediated the relationship between the physical appearance of money and spending when participants purchased privately (95% CI: -1.63 , $-.08$) but not publicly (95% CI: $-.12$, $.96$). This was despite participants believing the worn \$10 bill was more disgusting ($M = 3.20$) than the crisp \$10 bill ($M = 2.42$; $F(1, 116) = 16.38$, $p < .001$, $\eta^2 = .12$), an effect that did not vary by social context ($F < 1.5$). Hence, the social context did not alter perceptions of disgust but instead altered how participants responded to the source of disgust. As illustrated in figure 3, disgust led participants to spend the worn \$10 bill in the private consumption condition (positive b^{1a} beta). Disgust also seemed to have a counterinfluence in the public condition, although not significant (negative b^{1b} beta, $p = .12$). Nevertheless, this suggests people may be apprehensive about exercising the source of disgust in view of their peers.

When pride ($\alpha = .91$) was added to the model, a very different pattern of effects emerged. Participants reported greater pride of ownership for the crisp \$10 bill ($M = 4.89$) than for the worn \$10 bill ($M = 4.09$; $F(1, 116) = 13.75$, $p < .001$, $\eta^2 = .10$). This effect did not vary by social

context ($F < 1$). Yet again, the correlation between pride and disgust was negative and significant ($r = -.23$, $p < .05$). As predicted, pride mediated the relationship between the physical appearance of money and spending when participants purchased privately (95% CI: -1.87 , $-.02$) and publicly (95% CI: $.07$, 1.13). As with the results for disgust, the unstandardized betas tell the story. Pride led participants to save the crisp \$10 bill in private consumption condition (negative b^{2a} beta) but spend the crisp \$10 bill in the public consumption condition (positive b^{2b} beta). This is consistent with the prediction that people will exercise a source of pride to extract social utility.

The question that remains is, what does this mean for spending behavior? Overall, there was a significant interaction between physical appearance and social context on total amount spent ($F(1, 116) = 4.34$, $p < .05$, $\eta^2 = .04$). Simple effects revealed that participants in the public consumption condition spent more when they had a crisp \$10 bill ($M = \8.27) than a worn \$10 bill ($M = \5.87; $F(1, 116) = 3.59$, $p = .06$, $\eta^2 = .03$). The effect was not significant in the private consumption condition ($M_{\text{Crisp}\$10} = \5.33 vs. $M_{\text{Worn}\$10} = \6.94 ; $F < 2$). This result confirms the social context can moderate how the physical appearance of money influences spending.

The results of study 4 assist in isolating the effect of pride and ruling out several alternate explanations to emerge following study 3. Nevertheless, up to this point, pride and disgust have only been measured. They have yet to be teased apart through manipulation. This is important because, as study 4 illustrates, the two discrete emotions tend to operate on the same parallel. That is, people would obviously not have pride in something disgusting, although they would not necessarily be disgusted by something they are not proud of. This is why the negative correlation between the two discrete emotions is rather small but nevertheless significant. Hence, the goal of study 5 was to demonstrate the independent influence of pride while controlling for disgust.

STUDY 5: ISOLATING PRIDE

Study 5 was an exact replication of study 4 with one fundamental adjustment to control for disgust. Whether commencing the shopping task in the private or public condition, participants at the University of Winnipeg ($N = 120$; 57.5% female) were informed of the following: "You will notice that some of the bills in your wallet look pretty worn out. It's not that easy to get bills in perfect condition. Unfortunately, some of our previous participants have had issues with handling what looks like filthy money. This has turned out to be a bit of a problem. Rest assured we are required by ethics to ensure that all bills are free of germs and bacteria. Hence, all bills have been thoroughly sterilized prior to this study." To circumvent the possibility that participants may adjust their spending to avoid others inferring disgust, this information was conveyed in front of the peer group in the public consumption condition. Nothing else differed from study 4.

Results and Discussion

As with study 4, there was a significant physical appearance \times social context interaction ($B = .66$, $SE = .28$, $p < .05$). Unlike study 4, however, the nature of the interaction was such that there was no difference in participants' likelihood to break the \$10 bill in the private consumption condition (worn: 23.3% vs. crisp: 10.0%; $p = .30$), but there was a difference in the public consumption condition (worn: 6.7% vs. crisp: 26.7%; $\chi^2(1) = 4.32$, $p = .08$, $\phi = .27$). Once again, as evidence that participants were altering their behavior in light of social monitoring, 82% of the purchases in the public consumption condition were related to junk food, whereas 68% of purchases in the private consumption condition were related to junk food.

An analysis of disgust ($\alpha = .87$) confirmed that the control worked as intended. Participants believed the worn \$10 bill was no more disgusting ($M = 2.81$) than the crisp \$10 bill ($M = 2.69$, $p = .42$). This was reflected in the mediation analysis, with an insignificant indirect effect in both the private (95% CI: $-.43$, $.10$), and public conditions (95% CI: $-.07$, $.22$), as well as an insignificant correlation between pride and disgust ($r = -.08$, $p = .39$). When pride ($\alpha = .84$) was added to the model, the predicted pattern emerged. Participants reported greater pride of ownership for the crisp \$10 bill ($M = 4.74$) than for the worn \$10 bill ($M = 4.08$; $F(1, 116) = 15.22$, $p < .001$, $\eta^2 = .12$). Furthermore, pride mediated the relationship between physical appearance and spending when participants purchased privately (95% CI: -1.13 , $-.03$) and publicly (95% CI: $.06$, 1.07). More precisely, pride led participants to save the crisp \$10 bill in private (negative b^{2a} beta) but spend the crisp \$10 bill in public (positive b^{2b} beta).

As in study 4, these effects translated into a significant interaction between physical appearance and social context on total amount spent ($F(1, 116) = 4.15$, $p < .05$, $\eta^2 = .04$). Simple effects revealed that participants in the public consumption condition were marginally more likely to spend more when they had a crisp \$10 bill ($M = \8.53) than a worn \$10 bill ($M = \6.13; $F(1, 116) = 2.99$, $p = .08$, $\eta^2 = .03$). The effect was once again not significant in the private consumption condition ($M_{\text{Crisp}\$10} = \5.07 vs. $M_{\text{Worn}\$10} = \6.67 ; $F < 1.5$). Taken as a whole, the results confirm the independent influence of pride on spending behavior.

GENERAL DISCUSSION

Of course money is not always crisp and clean. Yet its availability or lack thereof occupies most aspects of human life. Hence, it is important to question the impact that money has on human behavior. Certainly, money is something more than a collection of objective units. The question is, how much more? The results of five studies suggest that the physical appearance of money can dramatically alter spending behavior. This finding is important given the dominant belief that people tend only to perceive the nominal value of money (Shafir et al. 1997). This belief underscores the emerging interest in the influence of denomination. How-

ever, beyond providing some of the first evidence that the physical appearance of money can alter spending behavior, this study offers insight into the relative strength of the influence of denomination on spending. By simply altering whether money was worn or crisp, we were able to enhance, attenuate, and even reverse the denomination effect. Furthermore, we offer some insight into why this occurs. People actively seek to acquire and retain crisp currency because it affords a source of pride to be expressed around others; however, people actively seek to divest worn currency because they are disgusted by the contamination from others. This suggests that the physical appearance of money matters more than traditionally thought, and like most things in life, it too is inextricably linked to the social context.

The inclusion of pride in this work warrants further discussion. The marketing literature has yet to scratch the surface on the role that pride plays in social consumption. This is not to ignore the literature on conspicuous consumption (Ordabayeva and Chandon 2011) but to suggest that the motivational nature of the emotion itself—as opposed to the behaviors it engenders—deserves closer scrutiny. Indeed, it would be tempting to suggest that the effects observed in this article could simply be explained by affect. However, unlike generalized positive affect, pride has the unique characteristic of incurring a cost to extract greater social utility. Generalized positive effect could not explain why someone would divest a crisp bill in studies 4 and 5 but retain it in study 3. Williams and DeSteno (2009, 287) put it nicely: “the experience of the emotion itself appears to be a principle motivator of adaptive behavior and social perception.” Indeed, the implications extend well beyond money.

Future research could explore pride as a potential mechanism for positive contamination. People will incur a financial burden to acquire George Clooney’s sweater but only if they can tell people about it (Newman, Diesendruck, and Bloom 2011). Much of the current focus on positive contamination is directed toward highlighting that an essence transfers from a target to the object. However, just like Argo et al. (2006) illustrate disgust as the underlying mechanism for negative contamination, pride could be the underlying mechanism for positive contamination.

Another natural extension of this research is in the area of valuation. Researchers have shown that the visual aesthetics of investment documents can positively influence stock valuation and investment behavior (Townsend and Shu 2010). There is also evidence that people have lay theories linking value and visual characteristics, such that the size of a coin positively correlates with its inherent value (Kirkland and Flanagan 1979). This relationship has been shown to operate on numerous dimensions, from color, to thickness, to even the coin’s physical shape (Bruce et al. 1983). The question that has yet to be addressed is, what does this mean for consumption? Specifically, would someone put a greater value on a product purchased with crisp currency than worn currency? Certainly more research is needed in this area.

As with all research, there are limitations with this work. One limitation may rest in the products utilized in the stud-

ies. While the physical appearance of the bills elicited emotion, it is also possible that products primed emotions of their own. Thus, the interplay between the emotions provoked by the bills and the emotions that may have primed from the products is unknown and could merit further investigation. Although we saw no evidence to suggest that purchase selection varied with physical appearance, it is possible that the products influenced spending behavior. Future work might examine this idea in a more rigorous fashion. Another limitation centers on disgust. While disgust may explain why consumers divest worn bills in a private setting, it could not explain why they retain them in a public setting. It is possible that consumers were embarrassed to use these bills in front of their peers, or perhaps they were simply avoiding any negative associations that the bills could elicit. Although we did not find support for this, future research might better isolate the role of disgust in social consumption.

In the end, this work cautions that one need only look at currency production to realize that the relative strength of the denomination effect may be inflated by the fact that smaller denominations tend to suffer greater wear and tear. With that said, the results are not intended to explain nor even challenge conventional explanations for the denomination effect. It may be tempting to conclude that worn currency may facilitate the norms governing spending behavior. We caution against this conclusion. The results may simply be driven by the fact that the motivational effects of pride and disgust override spending norms. This is not to downplay the results. Indeed, there is growing interest in how consumers generate detailed inferences from a product’s physical appearance (Noseworthy and Goode 2011; Noseworthy and Trudel 2011). This work suggests the same holds for money. This is important because researchers tend to regard currency as the means to consumption, not as a consumable itself. The results of this work suggest that money is subject to the same inferences and biases as the goods it procures.

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